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“Medical Forum” Monthly Recognised and Indexed by

- PMDC with Index Pakistan No. 48 Since 1998
- Pakmedinet Since 2011
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- PASTIC & PSA Since 2000
- NLP Since 2000
- WHO, Index Medicus (IMEMR) Since 1997
- EXCEPTRA MEDICA, Netherlands Since 2000
- EMBASE SCOPUS Database Since 2008
- Registered with International Serials Data System of France bearing ISSN No. 1029-385X Since 1992
- Registered with Press Registrar Govt. of Pak bearing No. 1221-B Copr. Since 2009
- ABC Certification Since 1992
- On Central Media List Since 1995
- Med. Forum Published from Lahore Since 1989
- Peer Review & Online Journal
- Electronic Publication of Journal Now Available on website: www.medforum.pk
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Nutritious Value of Garlic
Mohsin Masud Jan
Editor

The use of garlic in China dates back thousands of years. It was consumed by ancient Greek and Roman soldiers, sailors, and rural classes. Garlic (Allium sativum) is a species in the onion genus, Allium. Garlic was rare in traditional English cuisine and has been a common ingredient in Mediterranean Europe. Garlic was used as an Antiseptic to present gangrene during World War I and World War II. The serving size of 1-3 cloves (3-9 grams), garlic provides no significant nutritional value, with the content of all essential nutrients below 10% of the Daily Value (DV) (table). When expressed per 100 grams, garlic contains several nutrients in rich amounts (20% or more of the DV), including vitamins B6 and C, and the dietary minerals manganese and phosphorus. Per 100 gram serving, garlic is also a moderate source (10-19% DV) of certain B vitamins, including thiamin and pantothenic acid, as well as the dietary minerals calcium, iron, and zinc (table). The composition of raw garlic is 59% water, 33% carbohydrates, 6% protein, 2% dietary fiber, and less than 1% fat.

Table No.1: Garlic, raw: Nutritional value per 100g (3.5 oz)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Quantity</th>
<th>%DVt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>623 kJ (149 Kcal)</td>
<td></td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>33.06g</td>
<td></td>
</tr>
<tr>
<td>Sugars</td>
<td>1g</td>
<td></td>
</tr>
<tr>
<td>Dietary fiber</td>
<td>2.1g</td>
<td></td>
</tr>
<tr>
<td>Fat</td>
<td>0.5g</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>6.36g</td>
<td></td>
</tr>
<tr>
<td>Thiamine (B1)</td>
<td>9.2mg</td>
<td>17%</td>
</tr>
<tr>
<td>Riboflavin (B2)</td>
<td>0.11mg</td>
<td>9%</td>
</tr>
<tr>
<td>Niacin (B3)</td>
<td>0.7mg</td>
<td>5%</td>
</tr>
<tr>
<td>Pantothenic acid</td>
<td>0.596mg</td>
<td>12%</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>1.2350mg</td>
<td>95%</td>
</tr>
<tr>
<td>Folate (B9)</td>
<td>3ug</td>
<td>1%</td>
</tr>
<tr>
<td>Choline</td>
<td>23.2mg</td>
<td>5%</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>31.2</td>
<td>38%</td>
</tr>
<tr>
<td>Calcium</td>
<td>1.81mg</td>
<td>18%</td>
</tr>
<tr>
<td>Iron</td>
<td>1.7mg</td>
<td>13%</td>
</tr>
<tr>
<td>Magnesium</td>
<td>25mg</td>
<td>7%</td>
</tr>
<tr>
<td>Manganese</td>
<td>1.672mg</td>
<td>80%</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>153mg</td>
<td>22%</td>
</tr>
<tr>
<td>Potassium</td>
<td>401mg</td>
<td>9%</td>
</tr>
<tr>
<td>Sodium</td>
<td>17mg</td>
<td>1%</td>
</tr>
<tr>
<td>Zinc</td>
<td>1.16mg</td>
<td>12%</td>
</tr>
</tbody>
</table>

As of 2015, clinical research to determine the possible effects of consuming garlic on hypertension has found no clear effect. A 2016 meta-analysis indicated there was no effect of garlic consumption in blood levels of lipoprotein(a), a biomarker of atherosclerosis. Because garlic might reduce platelet aggregation, people taking anticoagulant medication are cautioned about consuming garlic.

A 2016 meta-analysis of case-control and cohort studies found a moderate inverse association between garlic intake and some cancers of the upper digestive tract. Another meta-analysis found decreased rates of stomach cancer associated with garlic intake, but cited confounding factors as limitations for interpreting these studies. Further meta-analyses found similar results on the incidence of stomach cancer by consuming allium vegetables including garlic. A 2014 meta-analysis of observational epidemiological studies found that garlic consumption was associated with a lower risk of stomach cancer in Korean people.

A 2016 meta-analysis found no effect of garlic on colorectal cancer. A 2014 meta-analysis found garlic supplements or allium vegetables to have no effect on colorectal cancers. A 2013 meta-analysis of case-control and cohort studies found limited evidence for an association between higher garlic consumption and reduced risk of prostate cancer, but the studies were suspected as having publication bias. A 2013 meta-analysis of epidemiological studies found garlic intake to be associated with decreased risk of prostate cancer. A 2014 Cochrane review found insufficient evidence to determine the effects of garlic in preventing or treating the common cold. Other reviews concluded a similar absence of high-quality evidence for garlic having a significant effect on the common cold.

The sticky juice within the bulb cloves is used as an adhesive in mending glass and porcelain. An environmentally benign garlic-derived polysulfide product is approved for use in the European Union and the UK as a nematicide and insecticide, including for use for control of cabbage root fly and red mite in poultry.

REFERENCES
Imipenem Hope and Threat From Carbapenemase Enzyme Producing Multi-Drug Resistant (MDR) Klebsiella Pneumoniae

Qandeel Abbas Soomro1, Inayatullah Memon1, Ghulam Abbas Soomro1, Shahzad Ali Jiskani1, Azizullah Khan Dhiloo2 and Rufaina Shah2

ABSTRACT

Objective: To evaluate the in-vitro efficacy of various antibiotics against Klebsiella pneumoniae by paper disk diffusion method and detection of enzyme carbapenemase of the isolates.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Department of Pathology and Microbiology, Indus Medical College Tando Muhammad Khan, for the period of 9 months from Sep 2018 to June 2019.

Materials and Methods: Strains were isolated and preserved in Nutrient agar slope in Beijou bottles, followed by subcultures on blood agar plate. Panel of antimicrobial agents e.g. Imipenem, Aztreonam, Gentamicin, Amikacin, Ceftazidime, ciprofloxacin, Cotrimoxazole, Ceftriaxone, Cefoxitin, Keflex, Piperacillin and Ampicillin were used.

Results: 104 (95%) strains were sensitive to Imipenem, 48 (44%) sensitive to Amikacin, 45 (41.2%) to Ceftriaxone, and 32 (29.32%) sensitive to Cotrimoxazole. While 19 (17.4%) were sensitive to Cefoxitin, 18 (16.5%) to Ceftriaxone, and 21 strains showed Carbapenemase enzyme positive activity.

Conclusion: Imipenem and other antimicrobial agents showed increased resistance to the organism. It will not be without risk of treatment failure and adverse impact on cost-effectiveness.

Key Words: Klebsiella pneumoniae, Imipenem, Carbapenemase, Multi-drug resistant


INTRODUCTION

Imipenem one of the most popular antibiotic of the group carbapenem is used as an intravenous beta-lactam antibiotic, was formulated and presented by Kenneth Wildonger, Burton Christensen, and William Leanza in the mid-1970s, these scientists worked for MERCK and company.1 Most of the beta-lactam drugs are antagonized and thereby made ineffective by beta-lactamase enzymes. While imipenem is stable against beta-lactamase enzymes as it is not neutralized by many bacteria which are resistant to antibiotics, including klebsiella pneumoniae.2 hence proved to be significant part in treating nosocomial infections that are not easily cured with other antibiotics that are available.3,4 In 1975 Imipenem became patented and in 1985 was sanctioned for medical consumption.3 Through lengthy trial-and-error research, it was found that a more stabilized form thienamycin (natural product), that was created by the micro-organism Streptomyces cattleya. Thienamycin has natural antibacterial natural activity, but being unsteady in aqueous solution, was not effective and viable agent to use in the patients.5 Imipenem possesses a wide spectrum of anti-bacterial activity against both the aerobic and anaerobic organism, including Gram-positive as well as Gram-negative bacteria.6

The anti-microbial activity of Imipenem is due to its antimicrobial action i.e. preventing cell wall synthesis of various Gram-positive and Gram-negative bacteria. It remains very stable in the presence of beta-lactamase enzymes i.e. (both penicillinase and cephalosporinase) raised as a result of a few bacteria, moreover, it strongly inhibits beta-lactamases from a few Gram-negative bacteria which are found to be resistant to many of the beta-lactam antibiotics.7

Klebsiella pneumoniae, one of the Gram-negative bacteria which has been found to cause many infections among humans; to mention few of them are pneumonia,
septicaemia, wound infections of many types including surgical one, and meningitis. Progressively, Klebsiella bacteria have evolved to acquire antimicrobial resistance, nearly allrelated to the family of antibiotics recognized as carbapenems. Klebsiella bacteria, are commonly found within the human intestines (where, surprisingly, these bacteria do not cause any disease). Inaddition, same bacteria can be found in individual’s stool (feces). In hospitals and other healthcare settings institutions, Klebsiella infections usually occur among patients who are sick and are under treatment for some other conditions. Even patients, who require intensive care or on life-saving devices like ventilators, or having intravenous catheters, and also the patients who are prescribed to take long doses of certain antibiotics are vulnerable to infections by Klebsiella infections. Whereas, fit and healthy people normally do not acquire Klebsiella infections.

Over the period, few Klebsiella bacteria became extremely resistant to antimicrobial agents. Once bacteria like Klebsiella pneumoniae produces an enzyme identified as a carbapenemase (well-known for KPC-producing organisms), the family of antibiotics called carbapenems would not be effective in killing the bacteria and cannot treat the infection completely. Klebsiella bacteria are mostly found in intestinal tract as a normal flora and these species belong to family of Enterobacteriaceae that can develop into carbapenem-resistant. CRE (carbapenem-resistant Enterobacteriaceae). CRE are a family of microbes that are hard to treat since they have high-level of resistance to antibiotics. Regrettably, carbapenem antibiotic are the last resort or drug of choice curtail infections produced by Gram-negative bacteria that are resistant to many other antimicrobials. Resistance to antimicrobial agents (AMR) led to increased mortality rate from unsuccessful treatments and compounded the cost of medical expenditure at many healthcare settings. While accurately predicting the exact public health risk and the associated cos may not be easily calculated because of multiple interplaying factors, but undoubtedly the rise to antibiotic resistance and emergence of mutation is a global threat that may lead to undesirable consequence i.e. pandemic. Hospital acquired infections are one of the major health problems globally due to increased morbidity and mortality. Patients staying in hospitals for prolonged periods are more vulnerable to Klebsiella pneumoniae infections.

Timely evaluation, detection and appropriate treatment in the management of different infections are necessary to reduce the morbidity and mortality rate of such patients. Primary aim of this study is to assess the in vitro efficacy of various antibiotics against Klebsiella pneumoniae by paper disk diffusion method isolated from various clinical specimens and to ascertain appropriate antimicrobial agent in the clinical settings.

Background of the study: Researchers observed individual patients’ case thoroughly and performed regular routine lab test culture and sensitivity twice at Indus Medical College Hospital, Tando Mohammad Khan. In both instances the effect and treatment of imipenem drug (Carbapenem group) failed. To find out the cause of treatment failure, an additional test to detect Carbapenemase enzyme was carried out and it was concluded that in the patient this enzyme was found due to Klebsiella pneumoniae, producing enzyme carbapenemase. This became the basis for further study to investigate the issue in detail so as to find which the drug was not effective to kill the microbial agents.

MATERIALS AND METHODS

It was a prospective observational study conducted at Department of Microbiology, Indus Medical College Tando Muhammad Khan. The study was carried out for the period of 9 months (Sep 2018 to June 2019). A total of 109 strains of Klebsiella pneumoniae were studied. The strains were isolated from various clinical specimens. These isolates were preserved in Nutrient agar slope in Beijou bottles that were labeled and refrigerated. At the time of study organisms were sub-cultured on Blood agar plate. The identification criteria were: Gram stain i.e. gram-negative bacilli, lactose fermenter, mucoid colonies, non-motile, citrate positive, urease positive, indole negative (MIU). Motility Indole Urea medium was used. Klebsiella pneumonia ATCC 700603 was included as a control strain.

Antimicrobial agents used were, Imipenem (IMI), Aztreonam (AZT), Gentamicin (GEN), Amikacin (AK), Ceftazidime (CAZ), Ciprofloxacin (CIP), Cotrimoxazole (TS), Ceftriaxone (CRO), Cefoxitin (Cef), Keflex (KF), Piperacillin (PIP), and Ampicillin (AP). All drugs were tested for their susceptibility.4 Results were interpreted according to Kirby – Bauer method. Paper disk diffusion method was adopted using Mueller – Hinton agar and paper disks of antibiotics from Oxoiddistributors. The inhibition zone of antibiotics according to CLSI M7-A10 were used to detect the inhibition zone of antibiotics was adopted showing in table-1. Due to financial problem only, Imipenem was tested with few strains and control organism by Eteststrip (bioMerieux) and showed nearly same results. Klebsiella pneumoniae ATCC 13495.

RESULTS

104 (95.4%) strains were sensitive to Imipenem, 48 (44%) showed their sensitivity to Amikacin, 45 (41.2%) sensitive to Ciprofloxacin and 32 (29.32%) were sensitive to Cotrimoxazole. While 19 (15.4%) were sensitive to Ceftazidime, 18 (16.5%) showed their sensitivity to Ceftriaxone, 18 (16.5%) sensitive to gentamicin, 9 (8.25%) sensitive to Cefoxitin, and 9 (8.25%) were sensitive to Keflex. And there was no
sensitivity against (0%) Piperacillin and ampicillin. The results are shown in the table 1, above. While their in-vitro performance is shown in Table-2.

From above studying all antibiotics / drugs used, Imipenem proved to be the drug of choice (95.4%) for Klebsiella pneumoniae, a big hope for multi-drug resistant Klebsiella pneumoniae. We performed another study for detection of carbapenemase enzyme i.e. Boronic acid disk method for carbapenemase detection Kp.11 Identification of carbapenemase producers in the clinical research laboratory is of great importance for the finding an effective therapeutic scheme and to suggest ways to effectively place infection control measures.

Working solution of the Boronic acid of 20 μl (including Boronic acid 400 μg), was poured on one of each pair of Imipenem disk on impregnated Muller Hinton agar. Imipenem disk plane and Imipenem disk with Boronic acid and agar plates were incubated. On next day. Plates were checked for zone of inhibition.11

Table No.1: Antibiotics concentrations and sensitivity zones:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Antibiotics</th>
<th>Concentration Mcg / ml</th>
<th>Sensitive Zone Diameter / mm</th>
<th>Sensitive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Imipenem</td>
<td>10 mcg</td>
<td>≥14</td>
<td>95.4</td>
</tr>
<tr>
<td>2</td>
<td>Amikacin</td>
<td>30 mcg</td>
<td>≥23</td>
<td>44</td>
</tr>
<tr>
<td>3</td>
<td>Ciprofloxacin</td>
<td>5 mcg</td>
<td>≥17</td>
<td>41</td>
</tr>
<tr>
<td>4</td>
<td>Cotrimoxazole</td>
<td>30 mcg</td>
<td>≥16</td>
<td>29.35</td>
</tr>
<tr>
<td>5</td>
<td>Cefazidime</td>
<td>30 mcg</td>
<td>≥25</td>
<td>17.4</td>
</tr>
<tr>
<td>6</td>
<td>Ceftriaxone</td>
<td>30 mcg</td>
<td>≥18</td>
<td>16.5</td>
</tr>
<tr>
<td>7</td>
<td>Aztreonam</td>
<td>30 mcg</td>
<td>≥12</td>
<td>16.5</td>
</tr>
<tr>
<td>8</td>
<td>Gentamicin</td>
<td>10 mcg</td>
<td>≥20</td>
<td>16.5</td>
</tr>
<tr>
<td>9</td>
<td>Cefoxitin</td>
<td>30 mcg</td>
<td>≥15</td>
<td>8.25</td>
</tr>
<tr>
<td>10</td>
<td>Keflex</td>
<td>30 mcg</td>
<td>≥17</td>
<td>8.25</td>
</tr>
<tr>
<td>11</td>
<td>Piperacillin</td>
<td>100 mcg</td>
<td>≥15</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Ampicillin</td>
<td>10 mcg</td>
<td>≥15</td>
<td>0</td>
</tr>
</tbody>
</table>

Table No.2: In vitro activity of deferent antibiotics against Klebsiella pneumoniae (n=109)

<table>
<thead>
<tr>
<th>No</th>
<th>Name of Antibiotic</th>
<th>Total isolates</th>
<th>Sensitive</th>
<th>% Sensitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Imipenem</td>
<td>109</td>
<td>104</td>
<td>95.4%</td>
</tr>
<tr>
<td>2</td>
<td>Amikacin</td>
<td>109</td>
<td>48</td>
<td>44%</td>
</tr>
<tr>
<td>3</td>
<td>Ciprofloxacin</td>
<td>109</td>
<td>45</td>
<td>41.2%</td>
</tr>
<tr>
<td>4</td>
<td>Cotrimoxazole</td>
<td>109</td>
<td>32</td>
<td>29.35%</td>
</tr>
<tr>
<td>5</td>
<td>Cefazidime</td>
<td>109</td>
<td>19</td>
<td>17.4%</td>
</tr>
<tr>
<td>6</td>
<td>Ceftriaxone</td>
<td>109</td>
<td>18</td>
<td>16.5%</td>
</tr>
<tr>
<td>7</td>
<td>Aztreonam</td>
<td>109</td>
<td>18</td>
<td>16.5%</td>
</tr>
<tr>
<td>8</td>
<td>Gentamicin</td>
<td>109</td>
<td>18</td>
<td>16.5%</td>
</tr>
<tr>
<td>9</td>
<td>Cefoxitin</td>
<td>109</td>
<td>9</td>
<td>8.25%</td>
</tr>
<tr>
<td>10</td>
<td>Keflex</td>
<td>109</td>
<td>9</td>
<td>8.25%</td>
</tr>
<tr>
<td>11</td>
<td>Piperacillin</td>
<td>109</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>12</td>
<td>Ampicillin</td>
<td>109</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Interpretation: The deference of 5 mm zone more was considered positive for carbapenemase producers.

Control strains: K. pneumonia BAA 1705 (positive control) and K. pneumonia BAA 1706 (negative control) both were used.

All (n=109) strains of Klebsiella pneumoniae were tested for carbapenemase enzyme, 21 strains showed Carbapenemase enzyme positive, that was Threat on our hope for treatment of Multi-drug resistant Klebsiella pneumoniae. Fig-2.

Figure No.1: Klebsiella Pneumonia Antibiogram

Figure No.2: Difference between imipenem resistant and carbapenimase enzyme +ve Klebsiella Pneumoniae (n=109)

DISCUSSION

Klebsiella pneumoniae is the major and primary cause of hospital–acquired infections. Due to continuously emerging resistance, treatment is a big challenging encountered by physician. Various antimicrobial agents are used in different settings, resistance to antibiotic drugs in various strains of Klebsiella pneumoniae occurs through a number of mechanisms, such as production of enzyme carbapenemase. One of the serious obstacles to any antimicrobial therapy of contagious infections caused by Gram-negative organisms is the presence of carbapenemases. Plasmid-mediated serine carbapenemases and Metallo-beta-lactamases such as Klebsiella pneumoniae carbapenemase endanger the usage of nearly all presently available beta-lactams including carbapenems.10

To find and detect the organisms that produce carbapenemases can be very difficult task, since their active presence not always bring about a resistant phenotype on conventional disc diffusion or even automated computerized testing techniques for example Phoenix and micro-scan. These automated testing
techniques can detect MICs but cannot detect carbapenemase enzyme. Often these enzymes are associated with laboratory research reports of false susceptibility carbapenems that carries potential serious harm. Furthermore, nearly all laboratories do not have technical facilities to detect carbapenemases. This perhaps can be due to the lack of proper guidelines or a deficient knowledge and skill. Since routine sensitivity tests may not be reliable, specialized techniques are advised to ascertain the severity and pattern of associated resistance. The research described in this article identifies the standard methodological analyses to detect various types of carbapenemases that may be implemented by laboratories engaged in the task of ascertaining cause of Gram-negative antimicrobial resistant bacteria. Therefore, the fast detection of carbapenemase production is essential to prevent their dispersion by effectively starting infection control measures of hospital acquired infections.11

CONCLUSION
To conclude the study between routine antibiotic sensitivity of Imipenem with Klebsiella pneumoniae and enzyme detection of Klebsiella pneumoniae was different showing increased percentage-wise resistance that was alarming for treatment of the patients having hospital acquired infections. This study clearly indicates that use of Imipenem, against Klebsiella pneumoniae routine sensitivity results will not be without the risk of treatment failure consequently endangering the cost-effectiveness.

Author’s Contribution:
Concept & Design of Study: Qandeel Abbas Soomro
Drafting: Inayatullah Memon, Ghulam Abbas Soomro
Data Analysis: Shahzad Ali Jiskani, Azizullah Khan Dhiolo, Rufaina Shah
Revisiting Critically: Qandeel Abbas Soomro, Inayatullah Memon
Final Approval of version: Qandeel Abbas Soomro

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES
Role of Harmonic Scalpel Versus Conventional Haemostasis Among Patients Undergoing Total Thyroidectomy

Fida Buzdar, Muhammad Azim Khan, Majeed Ullah Buzdar, Imran Asim, Hafeez Ullah Laghari and Rizwan Ahmad

ABSTRACT

Objective: To compare the outcome of harmonic Scalpel versus Conventional haemostasis in patients undergoing total thyroidectomy.

Study Design: Randomized controlled comparative study.

Place and Duration of Study: This study was conducted at the district head quarters & teaching Hospital Dera Ghazi Khan, from August 2019 to February 2020.

Materials and Methods: Consecutive 94 patients undergoing thyroidectomy were taken and were divided into two groups. Group A were treated using harmonic scalpel and while there in group B were treated by conventional haemostasis by same surgeon to record outcomes. Both gender male and female patients were included and the age range of those patients were from 18-50 years. Patients having heart disease, CRF, CLD and with traumatic history and the patients with Hepatitis-B and Hepatitis-C and pregnant ladies were excluded from the study.

Results: Of these 94 patients, 45(47.9%) were male patients while 49 (52.1%) were female patients. Mean age of patients was 37.26 ± 5.50 years (with minimum age of study was 23 years while maximum age was 50 Years. Mean duration of surgery in group A was 41.94 ± 5.82 minutes while in group B Mean duration was of surgery was 70.45 ± 8.52 minutes (P = 0.000). Mean duration of hospital stay in group A was 2.74 ± 0.675 days while in group B, it was 3.89 ± 0.938 days (P = 0.000). hypocalcemia was noted in 29 (30.9 %) in group A hypocalcemia was noted to be 12.8 % versus 48.9 % in group B. (P = 0.000).

Conclusion: Harmonic Scalpel is safe and effective procedure for patients undergoing total thyroidectomy as compared to Conventional haemostasis. Harmonic scalpel is associated with shorter duration of surgery, shorter hospital stay and decreased chance of Hypocalcemia.

Key Words: Thyroidectomy, harmonic, scalpel, conventional haemostasis.

INTRODUCTION

Thyroid disorders are the most frequently encountered endocrine diseases all over the world1. The prevalence of hyperthyroidism in women is between 0.5 % and 2 % and it is ten times less common in man. Total thyroidectomy is a surgical procedure which is performed to treat various thyroid diseases wherein thyroid gland is removed2 completely. Total thyroidectomy provides advantages of eliminating the risk of recurrence and hence increasing the number of total thyroidectomies being performed for benign diseases. Knowledge about clinical profiles of thyroidectomy cases and understanding post-thyroidectomy complications is an important milestone in public health3. Bleeding remains one of the major post operative complications of thyroid surgery, with the potential to cause life-threatening air way obstruction. During thyroidectomy, bleeding can obscure the operative field, making safe dissection of recurrent laryngeal nerve (RLN), and parathyroid gland difficult. Effective vessel hemoostasis can be achieved by using the conventional clamp-and-tie technique4; several studies have reported the successful use of bipolar vessel sealing system or the harmonic scalpel in shortening the length of thyroid surgery and reducing the blood loss5. It has been claimed that the use of the harmonic scalpel decreases the operative time, complications and bleeding in abdominal surgery, thoracic surgery, parotid surgery and thyroid surgeries6. This study was designed to document hypocalcaemia, mean hospital stay and duration of operative time among the patients undergoing thyroidectomy any...
using harmonic scalpel versus conventional hemostasis techniques.

**MATERIALS AND METHODS**

This study was conducted in the department of general surgery, district head quarter and teaching hospital Dera Ghazi Khan for a period of 6 months from 01-08-2019 to 01-02-2020. Patients of both gender male and female were included in the study. The age range of the patient were from 18-50 years. The patients with pre-operative hypocalcemia, previous history of thyroid surgery, patient with heart diseases, CRF, CLD and with traumatic injuries. Patient with Hepatitis B and C positive along with the patient with alcoholic abuse and pregnant ladies were excluded from the study. Consecutive 94 patients undergoing thyroid surgery were taken for our study. These patients were divided into two groups group A and group B. patients with group A were managed with harmonic scalpel during surgery and patients with group B were treated by conventional hemostasis technique by the surgeon having more than ten years experience after fellowship. Duration of surgery and duration of hospitalisation were noted in the performa. Mean operative time and duration of post operative hospital stay was compared using independent T-test at level of significance of 0.05. Hypocalcemia (Yes/No) in both groups was compared using chi-square test. Post stratification chi-square test was applied to see their effect on hypocalcemia while independent t-test was applied to see the effect of these confounders on duration of surgery and post operative hospital stay. P- value equal or less than 0.05 was considered as significant.

**RESULTS**

Our study comprised of a total of 94 patients meeting inclusion criteria of our study. Of these 94 study cases, 45 (47.9 %) were male patients while 49 (52.1%) were female patients.

**Table No. 1: Gender wise distribution of study cases (n = 94)**

<table>
<thead>
<tr>
<th>Gender (n = 94)</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>Male n = 45 (47.9 %)</td>
<td>21</td>
<td>44.7</td>
</tr>
<tr>
<td>Female n = 49 (52.1 %)</td>
<td>26</td>
<td>55.3</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean age of our study cases was 37.26 ± 5.50 years. (with minimum age of our study cases was 23 years while maximum age was 50 years). Mean age of the male patients was noted to be 37.64 ± 5.45 years while that female patients was 36.90 ± 5.80 years. (P – 0.514), our study results have indicated that majority of our study cases i.e 57 (60.6%) were aged more than 35 years.

**Table No. 2: Age wise distribution of study cases (n = 94)**

<table>
<thead>
<tr>
<th>Age Groups (in Years) (n = 94)</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>Up to 35 n = 37 (39.4 %)</td>
<td>18</td>
<td>38.3</td>
</tr>
<tr>
<td>More than 35 n = 57 (60.6 %)</td>
<td>29</td>
<td>61.7</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100</td>
</tr>
</tbody>
</table>

Of these 94 study cases, 52 (55.3%) belonged to rural areas and 42 (44. 3 %) belonged to urban areas. Diabetes was present in 18, 19, 17, 5 of our study cases. Hypertension was present in 26 (27.7 %) of our study cases. Mean body index of our study cases was 24.94 ± 2.23 kg/m² and obesity was present in 8 (8.5%) of our study cases.

Mean duration of surgery in group A was 41.94 ± 5.82 minutes while in group B mean duration of surgery was 70.45 ± 8.52 minutes (P = 0.000).

**Table No. 3: Distribution of duration of surgery among study cases (n = 94)**

<table>
<thead>
<tr>
<th>Group A (In Minutes)</th>
<th>Group B (In Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>41.94</td>
<td>5.82</td>
</tr>
</tbody>
</table>

P < 0.001

Mean duration of hospital stay in group A was 2.74 ± 0.675 days while in group B was, 3.89 ± 0.938 days (P = 0.000).

**Table No. 4: Distribution of mean hospital stay among study cases (n = 94)**

<table>
<thead>
<tr>
<th>Group A (In Days)</th>
<th>Group B (In Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>2.74</td>
<td>0.675</td>
</tr>
</tbody>
</table>

P < 0.001

Hypocalcemia was noted in 29 (30.9%) in group A, it was 12.8% versus 48.9% in group B (P = 0.000).

**Table No. 5: Distribution of hypocalcemia among study cases (n = 94)**

<table>
<thead>
<tr>
<th>Hypocalcemia (n = 94)</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Yes, n = 29 (30.9 %)</td>
<td>06</td>
<td>12.8</td>
</tr>
<tr>
<td>No, n = 65 (69.1 %)</td>
<td>41</td>
<td>87.2</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100</td>
</tr>
</tbody>
</table>

* P < 0.001
DISCUSSION

Total thyroidectomy a surgical procedure which is performed to treat various thyroid diseases wherein complete thyroid gland is removed. The use of total thyroidectomy procedure is considered not to be a safe procedure for thyroid CA and also for treatment of few benign diseases because of the risks involved. Our study comprised of total of 94 patients meeting inclusion criteria of our study. Of these 94 study cases, 45 (47.9%) were male patients while 49 (52.1%) were female patients. A study reported female gender predominance with male to female ratio was 1: 2.6 which is in compliance with our study results7.

Another study reported female gender preponderance with male to female ratio was 1: 2.2 which is similar to that of our study results8.

Mean age of our study cases was 37.26 ± 5.50 years (with minimum age of our study cases was 23 years while maximum age was 50 years).

Mean age of male patients was noted to be 37.64 ± 5.45 years while that female patients was 36.90 ± 5.80 years (P = 0.514).

Of these 94 study cases, 52(55.3 %) belong to rural areas and 42 (44.7%) belong to urban areas.

Hypertension was present in 26 (27.7%) of our study cases. Obesity was present in 8 (8.5%) of our study cases.

Mean duration of surgery in group A was 41.94 ± 5.82 minutes while in group B, it was 70.45 ± 8.52 minutes (P = 0.000).

Mean duration of hospital stay in group A was 2.74 ± 0675 days while in group B, it was 3.89 ± 0.938 days (P = 0.000) A study documented Harmonic scalpel when compared with conventional Haemostasis (CH) involves short post-operative hospital stay (2.2 ± 0.9 versus 3.7 ± 1.3 days9). The findings are close to our study results. Hypocalcemia was noted in 29 (30.9%), in group A. Hypocalcemia was also lower in Harmonic Scalpel group A patients (14%) as compared with conventional haemostasis having 42% hypocalcemia which is in compliance with our study results10.

CONCLUSION

Harmonic scalpel is safe, reliable and effective for patients undergoing total thyroidectomy. As compared to conventional haemostasis, harmonic scalpel is associated with significantly shorter duration of surgical procedure, shorter hospital stay and decreased hypocalcemia. All surgeons treating such patients should employ total thyroidectomy with harmonic scalpel to achieve the desired clinical outcomes.

Author’s Contribution:
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Ahmad
Revisiting Critically: Fida Buzdar,
Muhammad Azim Khan
Final Approval of version: Fida Buzdar

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

Frequency of Residual Tumor on Redo Transurethral Resection of Bladder (TURB) and Its Impact on Management of Non Muscle Invasive Bladder Cancer

Jameel Ahmad, Abdul Ghaffar, Atta ur Rehman, Umar Ghaffar and Zainab Javeed

ABSTRACT

Objective: In this study, we have searched the frequency of residual tumor and its stage in cases found to have Non Muscle Invasive Bladder Cancer (NMIBC) on first procedure and underwent Redo-TURB. More so the impact of Redo-TURB on the management was studied.

Study design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Urology Department of Nishtar Medical University/Hospital Multan from July 2017 to August 2019.

Materials and Methods: Based upon the Inclusion and exclusion criteria, using non-probability consecutive sampling technique, we selected a total of 144 patients. These cases were diagnosed with NMIBC on first TURB but due to certain reasons underwent Redo-TURB.

Results: There were 144 patients in total. Males were 108/144 (75%) while females were 36/124 (25%). Mean age of the patients was 53.18±5.82 years. Mean duration of symptoms before the diagnosis was found to be 6.20±2.30 months. Residual tumor was found to be present in 96/144 (66.7%) while no tumor was identified in 48/144 (33.3%). Histopathology of Redo-TURB case having residual tumor came out as Non-muscle invasive bladder cancer (NMIBC) 77/96 (80.21%) and muscle invasive bladder cancer (MIBC) 19/96 (19.79%). There was no significant effect of gender, age and duration of symptoms on the frequency of residual tumor.

Conclusion: Redo-TURB should be advised in particular situations in patients who are diagnosed to have NMIBC on first resection. The aim is to achieve more complete tumor resection, proper staging and management of NMIBC. Redo-TURB also helps to identify cases having invasive disease that need aggressive treatment but were under staged due to incomplete resection.

Key Words: Non Muscle Invasive Bladder Tumor, Redo Transurethral Resection of bladder tumor, Residual Tumor


INTRODUCTION

Bladder cancer is one of the most common urinary tract tumors; being the 9th most common tumors worldwide. Non-muscle invasive bladder cancer (NMIBC) accounts for 70% of all new cases; this is known as ‘superficial bladder cancer’. Muscle-invasive disease and flat non-invasive carcinoma in situ (CIS) account for 25% and 5% respectively. Superficial urothelial tumors are usually papillary in nature that grow in an exophytic fashion into the bladder lumen.

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

NMIBC can appear as single but can arise as multiple de novo being field change of transitional epithelium. Tumor can be narrow based on single stalk or can be broad based in cases of less well differentiated type. Surrounding mucosa also develops changes like edema and dilated, tortuous dark colored vessels. The most common sites for superficial tumors are the trigon and lateral walls of the urinary bladder.

Transurethral resection of bladder tumor (TURB) is the gold standard treatment option for NMIBC. However, after initial complete treatment by endoscopic transurethral resection (TURB), there is high incidence of recurrence and progression of disease and about 15% patients develop MIBC. The risk of such progression is high with high grade disease, pT1, multiple primary tumors and concomitant CIS. The behavior of bladder tumor provides a rationale for check cystoscopies.

Follow up check cystoscopies are advised at regular intervals to all patients. Findings of first check cystoscopy after 3 months of TURB have great prognostic value regarding recurrence and progression of disease. There are certain indications wherein the
first TURB is thought to be incomplete so Redo TURB is advised after two to four weeks in patients with pT1, high grade, incomplete resection of bladder tumor and cases in which muscle not included in biopsy. Ali MH and co-workers from Egypt conducted an analytical prospective study on 91 patients with pathological stage T1 and Ta bladder tumor in which all the patients underwent Redo TURB within 2 to 6 weeks of the initial resection. They recorded histopathological findings of the second TURB and compared them with the initial ones. Their study brought to light that on second-look TURB, 38 (41.7%) patients had no tumor at all, 22 (24.2%) patients had residual cancer of the same stage, 9 (14.8%) patients of pT1 had lower stage and 22 (24.2%) had higher stage tumor. Therefore, upstaging led to change the treatment strategy in 22 (24.2%) patients. In another study carried out in USA, Herr reported 49% patients with upstaged tumor on re-TURB in the patients with T1G3/T1HG whose muscularis propria was not present in the specimen. Also, he observed that only 14% patients found upstaged on re-TURB in the patients whose initial TURB reflected benign muscularis propria. Moreover, 17% of the patients showed histological evidence of cancer on TURB despite of a normal cystoscopic examination.

MATERIALS AND METHODS

Across sectional study was done in Urology department of Nishtar Hospital Multan (NHM) from 01-07-2017 to 31-08-2019. There were total 144 patients and sampling technique was non-probability consecutive sampling. 

Inclusion Criteria:
- Patients of age 40-60 years of either sex
- The patients who had pT1, G3 on histology.
- Muscle if not identified in biopsy specimen.
- Incomplete resection of bladder tumor.
- Tumor operated in non-specialized centers

Exclusion Criteria:
- The patients with known advanced bladder carcinoma.
- Patients who had undergone any kind of previous treatment.
- Co-morbid conditions e.g. ischemic heart disease
- MIBC on first TURB

A proforma was specifically designed to record findings of this study. We collected samples and data from the patients with diagnosed cases of non-muscle invasive bladder cancer on biopsy after primary TURB, admitted to the urology ward of Nishtar Hospital Multan after an informed consent and assurance of confidentiality. Patients were followed for redo TURB 2 to 4 weeks after the initial resection. Frequency of residual tumor and muscle invasive disease at redo TURB of non-muscle invasive bladder tumor was documented on the proforma.

RESULTS

There were 144 patients in total. Males were 108/144 (75%) while females were 36/144 (25%). Mean age of the patients was 53.18+5.82 years. Mean duration of symptoms before the diagnosis was found to be 6.20 + 2.30 months. Residual tumor was found to be present in 96/144 (66.7%) while no tumor was identified in 48/144 (33.3%). Among those who were found to have residual tumor. It was found to be muscle non-invasive in 77/96 (80.21%) and muscle invasive in 19/96 (19.79%) (Table, Graph 1,2,3).

Table No.1: Characteristics of the study population

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients</td>
<td>144</td>
</tr>
<tr>
<td>Males</td>
<td>108/144 (75%)</td>
</tr>
<tr>
<td>Females</td>
<td>36/144 (25%)</td>
</tr>
<tr>
<td>Mean age</td>
<td>53.18+5.82</td>
</tr>
<tr>
<td>Mean duration of symptoms</td>
<td>6.20 + 2.30</td>
</tr>
<tr>
<td>Residual tumor</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>96/144 (66.7%)</td>
</tr>
<tr>
<td>No</td>
<td>48/144 (33.3%)</td>
</tr>
<tr>
<td>Stage of residual tumor</td>
<td></td>
</tr>
<tr>
<td>Muscle noninvasive</td>
<td>77/96 (80.21%)</td>
</tr>
<tr>
<td>Invasive</td>
<td>19/96 (19.79%)</td>
</tr>
</tbody>
</table>

Graph No.1: Gender distribution in the patient population

Graph No.2: Frequency of patients with residual tumor on redo TURB

Graph No.3: Frequencies of muscle noninvasive and invasive tumors on redo TURB biopsy
When the effect of gender was noted, it was found that among 108 male patients, the mean age was 52.89 + 5.89 years, mean duration since diagnosis was 6.18 + 2.30 months. There was no residual tumor found in 35/108 (32.4%) patients while it was found in 73/108 (67.6%) patients. Among those who had residual tumor it was found to be muscle non-invasive in 59/73 (80.82%) while it was invasive in 14/73 (19.17%). Among 36 females mean age mean was 54.06 + 5.59 years, mean duration was 6.28 + 2.32 months. No residual tumor was found in 13/36 (36.1%) while tumor was found in 23/36 (63.9%) (p-value > 0.05). Among those with residual tumor present on redo-TURB, 18/23 (78.26%) had muscle non-invasive tumor while 5/23 (21.7%) had invasive tumor (Table 2).

Table No.2: Comparison of various characteristics among males and females.

<table>
<thead>
<tr>
<th></th>
<th>Males (n = 108)</th>
<th>Females (n = 36)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>52.89 + 5.89</td>
<td>54.06 + 5.59</td>
<td></td>
</tr>
<tr>
<td>Mean duration of symptoms</td>
<td>6.18 + 2.30</td>
<td>6.28 + 2.32</td>
<td></td>
</tr>
<tr>
<td>Residual tumor</td>
<td></td>
<td></td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Present had to be</td>
<td>73/108 (67.6%)</td>
<td>23/36 (63.9%)</td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>35/108 (32.4%)</td>
<td>13/36 (36.1%)</td>
<td></td>
</tr>
<tr>
<td>Stage of residual</td>
<td></td>
<td></td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>tumor</td>
<td>Non-invasive</td>
<td>59/73 (80.82%)</td>
<td></td>
</tr>
<tr>
<td>Invasive</td>
<td>14/73 (19.17%)</td>
<td>5/23 (21.7%)</td>
<td></td>
</tr>
</tbody>
</table>

When the effect of age was noted, it was found that there were 40 patients in age group 40-50 years. Mean duration of symptoms was found to be 6.20 + 2.24 months. Males were 31/40 (77.5%) while females were 9/40 (22.5%). Residual tumor was present in 24/40 (60%) while it was not present in 16/40 (40%). Among those who had residual tumor, it was found to be muscle non-invasive in 18/24 (75%) and invasive in 6/24 (25%). Among 104 patients with age > 50 years, mean duration was found to be 6.20+ 2.24 months. Residual tumor was not present in 32/104 (30.8%) while it was present in 72/104 (69.2%). Among those who had residual tumor on redo TURB, the tumor was found to be muscle non-invasive in 59/72 (81.94%) while it was found to be invasive in 13/72 (18.05%) (Table 3).

When the effect of duration of symptoms was noted it was found that among 83 patients with duration < 6months, mean age of the patients was 52.98 + 5.77 years, males were 63/83 (75.9%) while females were 20/83 (24.1%). Residual tumor was found to be absent in 32/83 (38.6%) and present in 51/83 (61.4%). Among those who were found to have residual tumor, upon staging of the tumor it turned out to be muscle non invasive in 41/51 (80.39%) and invasive in 10/51 (19.6%). Among those with duration of symptoms more than 6 months there were 61 patients in total with mean age of 53.46 + 5.93 months. Males were 45/61 (73.8%) while females were 16/61 (26.2%). Residual tumor was present on redo TURB in 45/61 (73.8%) while it was absent in 16/61 (26.2%). Among those who had residual tumor found 36/45 (80%) were found to be muscle non invasive while 9/45 (20%) were found out to be invasive (Table 4).

Table No.4: Comparison of various characteristics among patients with different duration of symptoms.

<table>
<thead>
<tr>
<th></th>
<th>Duration &lt; 6months (n = 83)</th>
<th>Duration &gt; 6months (n = 61)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>63/83 (75.9%)</td>
<td>45/61 (73.8%)</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>20/83 (24.1%)</td>
<td>16/61 (26.2%)</td>
<td></td>
</tr>
<tr>
<td>Mean age</td>
<td>52.98 + 5.77</td>
<td>53.13 + 5.85</td>
<td></td>
</tr>
<tr>
<td>Residual tumor</td>
<td>Present</td>
<td>51/83 (61.4%)</td>
<td>45/61 (73.8%)</td>
</tr>
<tr>
<td></td>
<td>Absent</td>
<td>32/83 (38.6%)</td>
<td>16/61 (26.2%)</td>
</tr>
<tr>
<td>Stage of residual tumor</td>
<td>Non-invasive</td>
<td>41/51 (80.39%)</td>
<td>36/45 (80%)</td>
</tr>
<tr>
<td></td>
<td>Invasive</td>
<td>10/51 (19.6%)</td>
<td>9/45 (20%)</td>
</tr>
</tbody>
</table>

DISCUSSION

For Non-muscle invasive bladder cancer, Transurethral resection of bladder tumor is considered Gold standard surgical procedure. Recent data suggests that Primary TURB can remove bulk of tumor, but still in some
the situations, complete resection of tumor is not possible that leads to under staging of the disease and mis-management. Some of Histopathology reports describe the fact that Redo TURB performed within eight weeks after initial TURB has higher incidence of residual tumor of about 18-77% \cite{14,15,18}. Meanwhile, tumor stage changed in about 40% of patients\cite{16}. Following are factors causing Re-TURB positive: Grade and stage of tumor, size of tumor, Recurrence history of Tumor, interval between two TURBs, operation by surgeon, etc\cite{17,18}. Various studies show that positive rate is comparatively high in Re-TURB, hence, most analysts believe that under the condition of TURB, tumor features itself are the key factor of residual tumor, and higher incidence of tumor recurrence or progression in those patients who are showing positive rates in TURB\cite{19}. This research shows that a high rate of residual tumor can be found in the repeated TURB performed 4-6 weeks after initial TURB in patients with non-muscle invasive bladder urothelial carcinoma.

In terms of surgical complications, there was no bladder perforation or rupture upon Redo-TURB, and relevant documents at home and abroad \cite{14,15,19,20} also confirm that the complications of Re-TURB are basically the same as those of routine TURB. Therefore, we believe that it is safe to perform Re-TURB 4-6 weeks after the initial TURB.

In our study there were 144 patients in total. There was a male predominance as males were 108/144 (75%) while females were 36/124 (25%). This was because bladder cancer is more frequent among males as compared to females with a male to female ratio of 3:1 to 5:1\cite{21,22}. Mean age of the patients was 53.18 ± 5.82 years which was reflective of our inclusion criteria and the age group in which bladder cancer is more frequently encountered. Mean duration of symptoms before the diagnosis was found to be 6.20 ± 2.30 months. Residual tumor was found to be present in 96/144 (66.7%) while no tumor was identified in 48/144 (33.3%). Among those who were found to have residual tumor, the tumor was found to be muscle non-invasive in 77/96 (80.21%) while it was found to be invasive in 19/96 (19.79%). There was no significant effect of age, gender or duration of symptoms on the frequency of tumor on 2nd look TURB. These results were similar to those reported in other studies. In an analytic prospective cohort study conducted by Ali et al.\cite{23} included 91 patients with stage T(1) and T(a) bladder cancer. All patients underwent Redo TURB during 2 to 6 weeks after the first resection. Histopathologic findings of the second TUR of bladder tumor (TURB) were compared with those of the initial one. Specimens of resection obtained during the Redo TURB showed no tumor in 38 (41.7%) patients; 22 (24.2%) patients had residual cancer of the same stage, 9 (14.8%) patients of pT(1) had a lower stage, and 22 (24.2%) had a higher stage. Treatment plan needed revision in 22 (24.2%) cases as a result of upstaging of histopathology report of Redo TURB. Appearance, size, grade, and stage of the tumor at the initial resection are all considered independent risk factors for upstaging detected at Redo TURB.

In another study conducted by Schwaibold et al. the initial result and histopathological diagnosis of TURB in the series of 136 patients was T1 transitional cell carcinoma (TCC). Of the 136 patients, 101 underwent TURB for first time and 35 had recurrent tumors. The second TURB was done 4-6 weeks after first procedure. The evaluation included the presence of previously undetected residual tumor, inclusion of muscularis propria in specimen, changes to histopathological staging/grading, and tumor location. In all, 71 patients (52%) had residual disease according to findings from specimens obtained during RedoTURB. The staging was: no tumor, 65 (48%); Ta, 11 (8%); T1, 32 (24%); Tis, 15 (11%); and > or = T2, 13 (10%). Histopathological changes that worsened the prognosis (>T1 and or concomitant Tis) were found in 21% of patients. Residual malignant tissue was found in the same location as the first TUR in 86% of the patients, and at different locations in 14%. Overall, 28 patients (21% of the original 136) had a radical cystectomy as a consequence of the second TURB findings.

In a study conducted by Grimm et al., residual tumor was found in 33% of all Re TURB cases including 27% of Ta and 53% of T1 disease and 81% at the initial resection site. Progression to muscle invasive disease was observed in only 2 patients (3%) after a mean observation of 61 months\cite{24}. Repeat Transurethral resection (Redo TURB) is advocated as a fundamental step towards complete clearance and appropriate staging of T1 bladder cancer tumors\cite{25}.

In another study conducted by Katsuyoshi Hashine, Takhiro Ide et al, no cancer was found in 33 patients (41.8%), CIS in 18 (22.9%), Ta in 15 (19.0%), T1 in 12 (15.2%), and muscle invasive T2 bladder cancer in 1 patient (1.3%). Study conducted by Cumberbatch MGK, residual tumor at re TUR was found in 17-67% of patients following Ta and in 20-71% following T1 cancer. Most residual tumors (36-86%) were found at the original resection site. Upstaging occurred in 0-8% (Ta to > T1) and 0-32% (T1 to > T2) of cases\cite{26}. Compared to patients without second TUR, patients with second TUR had significantly higher 5-year, 7-year and 10-year rates for Recurrence free survival (59.4%, 57.9%, 54.8% respectively) and progression free survival (93.3%, 91.9%, 90.4% respectively) and 10-year overall survival was significantly higher in patients with second TUR (59.1%). Second TUR should be routinely performed in all stages pT1 NMIBC patients with life expectancy of at least 10 years, given the positive contribution to all oncological outcomes.

It is clearly shown that second TUR, which is performed only after complete first TUR, has significantly decreased the recurrence and progression rates with newly diagnosed T1 disease compared to patients with T1 disease but with no second TUR\cite{27}.

**CONCLUSION**

Redo TURB should be advised in particular situations in patients who are diagnosed to have NMIBC on first resection. The aim is to achieve more complete tumor
resection, proper staging and management of cases identified to have invasive disease that need aggressive treatment.

Author’s Contribution:
Concept & Design of Study: Jameel Ahmad
Drafting: Abdul Ghaffar, Atta ur Rehman
Data Analysis: Umar Ghaflar, Zainab Javeed
Revisiting Critically: Jameel Ahmad, Abdul Ghaffar
Final Approval of version: Jameel Ahmad

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES
Comparison of Success of Palatal Rotation Flap versus Buccal Advancement Flap for Closure of Oroantral Fistula

Muhammad Aamir¹, Farhad Ali³, Arshad Abbas², Muslim Khan⁴ and Tahir Ullah Khan⁵

ABSTRACT

Objective: To compare success of palatal rotation flap versus buccal advancement flap for oroantral fistula closure.

Study Design: Randomized control trial

Place and Duration of Study: This study was conducted at the Department of Oral and Maxillofacial Surgery, Gajju Khan Medical College/Bacha Khan Medical Complex, Shah Mansoor, Swabi from June 2019 to December 2019.

Materials and Methods: One hundred and fifty two patients were included in this randomized clinical trial. Two groups were created: group A (palatal rotational flap) and group B (buccal advancement flap). After surgery, nasal decongestant and antibiotics were given. Patients were recalled at 15th day and at 1 month after surgical procedure for the examination of the area of oroantral fistula and flap were assessed clinically.

Results: In palatal rotation flap and buccal advancement flap groups, the mean ages were 33.07±7.67 and 32.26±7.07 years. 61.8% males and 38.2% females, 65.7% males and 34.3% females. 2.7% patients have malnutrition and 3.9% have history of malnutrition. Seventy patients (92.1%) have success and 65 patients (85.5%) have success rate in palatal rotation flap and buccal advancement flap respectively. Statistically, there was no significant difference (P = 0.198).

Conclusion: Both of these flaps are good to close the oroantral fistula. The success of the palatal rotation flap was more successful for large as well as medium and small defects but buccal advancement flap was successful for medium and small defects, showing failure in large defects.

Key Word: Frequency, flap success, Buccal advancement flap, Oroantral fistula, Palatal rotation flap


INTRODUCTION

Oroantral communication is an pathological communication between oral cavity maxillary sinus, lined by epithelium, classified as vestibule-sinusal, alveolo-sinusal, and palate-sinusal.¹

Extraction of posterior teeth is the main cause of their formation, as maxillary molars and premolars have close relationship to maxillary sinus.

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Received: January, 2020
Accepted: February, 2020
Printed: May, 2020
closure. Success of the flap depends upon local and general factors such as elimination of pre-existing sinus infection and removal of epithelial tract. Other researchers used Guided Bone Regeneration (GBR), Tissue Guided Regeneration even Alloplastic material for oroantral fistula closure. Closure was achieved by interposition of septal cartilage. Buccal advancement is considered as first choice for closures of oroantral fistula. They are further classified into three flaps. The flap is mostly used for closure of oroantral fistula. It is trapezoid shaped mucoperioseal flap created by incision in the buccal sulcus and then displaced in to the area containing fistula. The success rate was report 93% for closure oroantral fistula. In other literature success rate was shown 87.2% and 82.2% [8,10]. Follow up in these studies were 15 days to 7 weeks. It is a convenient flap with reliable and quick reconstruction, easy to mobilize with minimal donor site morbidity and fewer complications. With close adaptation to the site minimizes the risk of infection. [10]

Decreasing the depth of sulcus, maintain oral hygiene and pain, interference for prosthesis placement are some disadvantages of buccal advancement flap. Palatal rotation flap is another technique for closure of oroantral fistula. It is an axial pattern flap, have a specific artery, based upon greater palatine artery. The success rate for this is 76% in literature. Disadvantages are denudation of palatal bone, post-operative pain, more recipient site morbidity, deepening of secondary epithelial area. Other disadvantage is that Kent occur at arc of rotation which may compromise blood supply to the flap leading to necrosis as well as longer duration of operation. No comparative study available in literature to compares the both flaps. Few case series and no conclusive study available for oroantral fistula whether buccal advancement or palatal rotational flap is a standard. Various studies attempted to compare both the flap but none of them provide clear documentation and showing controversial results. Some literature is in favour of buccal advancement flap with the success rate of 93% and 82.2% [10,11] while other is in favour of palatal rotational flap with the success rate of 76% for closure of oroantral fistula. Some literature advocated that buccal advancement should be used for small fistula and palatal rotational flap for large defects. 

**MATERIALS AND METHODS**

This randomized control trial was carried out in the Department of Oral and Maxillofacial Surgery, Gajju Khan Medical College/Bacha Khan Medical Complex, Shah Mansoor, Swabi from 18th June 2019 to 18th December 2019. One hundred and fifty two patients (76 in each group) were taken. Inclusion criteria were males and females, age between 15 to 60 years, positive nose blow test, oroantral fistula more than 5 mm (diameter will be measured by Periodontal Probe), history of tooth extraction and history of trauma. Exclusion criteria were habits (smoking, paan, etc), pre-existing sinus pathologies (sinusitis etc), foreign bodies in area of fistula – clinical examination, Systemic disease contraindicate surgery (diabetes, bleeding problems etc) and tumor or its remnants at site of fistula. Protocol of the study, the data used for the research was explained to the patients to take the consent. Patient’s data like patient’s age and gender name were recorded. Routine investigations and radiographs like occipitomental view (37’) were taken. Pre-existing sinusitis was treated with nasal decongestant and antibiotics. Patients were selected randomly via lottery method and divides into two groups. Group A, who was underwent palatal rotational flap and group B which was treated by buccal advancement flap. Procedure was done by postgraduate resident under supervision of Head of the Department under local anesthesia. After surgical procedure, nasal decongestant and antibiotics were given and asked to avoid nose blowing, sucking on straw, sneezing on close mouth and smoking. Patients were recalled at 15th day and at 1 month after surgical procedure for the examination of the area of oroantral fistula and flap were assessed clinically. Flap was examined by direct visual examination and through dental mirror for the epithelization. If there was a complete closure of the perforation (oroantral fistula), that is complete epithelization and having no continuity defects the flap was considered successful, as per operational definition. Examination was done by me under supervision of the head of the department. The data was entered and analyzed through SPSS-20.

**RESULTS**

In group A (palatal rotational flap) were 76 (50%) and in group B (buccal advancement flap) were 76 (50%). The mean age was 33.07±7.67 years in group A and 32.26±7.07 years was in group B. overall mean age was 33.05±3.8 years. Male to female ratio was in group A and 1:1 and 1.9:1 was in group B, with overall ratio 1.7. The means of the size of defect in rotational group was 6.67±3.67 mm and 6.20±3.05 mm in buccal advancement group. The most common age group in palatal rotational flap group was 31 to 40 year 37 (48.8%) followed by 21-30 years 28 (36.8%). Similarly, in the buccal advancement group, the most common age group in palatal rotational flap group was 31-40 year 37 (48.8%) followed by 21-30 years 28 (36.8%). There were 47 (61.8%) males and 29 (38.2%) females in palatal rotational flap group, while in the buccal advancement flap group, 50 (65.7%) were males and 26 (34.3%) were females. Of total 2 (2.7%) patients (have history of malnutrition and 74 (93.3%) patients have no history of malnutrition in palatal rotational flap group while in buccal advancement flap group, there were 3 patients (3.9%) have history of malnutrition and
73 patients (96.1%) have no history of malnutrition (Table 1).

The most range of size of defect was 2–5 mm 33 (43.4%) followed by 6-10 mm 32 (42.2%) in group A. Similarly the most range of size of defect was 2–5 mm 34 (44.8%) followed by 6–10 mm 35 (46.0%) in group B (Table 2).

Table 3 showed the success for flap for oroantral fistula is significantly higher in males with a male to female ratio of 1.7:1, which is in agreement with our study. Same was reported by Qureshi et al. In our study the presenting age was from 15 to 60 years with the mean age of 33.07±7.67 and 32.26±7.07 in palatal rotation flap and buccal advancement flap respectively. Most of the patients were in 3rd and 4th decades in both groups which is in agreement with the studies being highest in 4th decade. In our study the smallest defect width reported was between 2-5mm and the largest defect width of 18mm was reported which also correlates with the study. The mean defect size was 6.67±3.67 and 6.20±3.05 in Palatal rotation flap and in buccal advancement flap respectively. Hassan et al reported average width diameter of about 0.54 cm (5.4mm) in OAF.

For the success of any flap operation three factors are important to perform for the closure of oroantral fistula. They are antral secretion diversion into nose antra must have no infection and adequate vascularization of the flap. Maxillary sinusitis have contributory factor in flap failure. Other causes which leads to failure are, immobility, inadequate trimming of the traumatized, flap’s width and length insufficient and poor vascularity of the scarred tissue, and impaired blood supply and extensive tension.

Palatal rotation flap procedure was tried in group-A. In this group only six cases failed. Compared to buccal advancement flap, palatal rotation flap was more successful of defect more than 1cm also reported similarly. The reliability of the palatal flap was more for oroantral fistula closure. The excellent blood easy mobilizing and its supply and donor site morbidity minimal makes the good and ideal for OAF closure. It should be considered as backup flap in case other methods fail. This flap is used after buccal advancement flap fails and having good bulk with axial pattern flap which have a definite blood supply and can easy be mobilized. Success of the flap in our study was 92.1% which correlates with the Qureshi et al and Anavi et al and in contrast with Visscher et al reported to be 76%. The difference may be due ethnic, genetic and surgeon experience.

The buccal advancement flap used in group-B, in those cases, which had a deep buccal sulcus and opening was small. The group-B that in which buccal advancement flap was used, 65 cases shown success while 11 were unsuccessful. It was reported that it has the tendency of decreasing the sulcus depth and also difficult to maintain the oral hygiene. Similar findings were also reported by Zide et al. It a reliable and quick method with a very minimal donor sit morbidity with a very less complication. Due to close relationship with the defect makes it successful with the less complication.

The palatal rotation flaps have axial pattern on the greater palatine artery which is an important factor in

### Table No.1: Frequency of age groups and gender and malnutrition in both groups of flap

<table>
<thead>
<tr>
<th>Variable</th>
<th>Palatal rotational flap</th>
<th>Buccal advancement flap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 – 20</td>
<td>3 (3.9%)</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>21 – 30</td>
<td>28 (36.8%)</td>
<td>29 (38.2%)</td>
</tr>
<tr>
<td>31 – 40</td>
<td>37 (48.8%)</td>
<td>40 (52.6%)</td>
</tr>
<tr>
<td>41 – 50</td>
<td>5 (6.6%)</td>
<td>4 (5.3%)</td>
</tr>
<tr>
<td>51 – 60</td>
<td>3 (3.9%)</td>
<td>1 (1.3%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>47 (61.8%)</td>
<td>50 (65.7%)</td>
</tr>
<tr>
<td>Female</td>
<td>29 (38.2%)</td>
<td>26 (34.3%)</td>
</tr>
<tr>
<td>Malnutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2 (2.7%)</td>
<td>3 (3.9%)</td>
</tr>
<tr>
<td>No</td>
<td>74 (97.3%)</td>
<td>73 (96.1%)</td>
</tr>
</tbody>
</table>

### Table No.2: Frequency and percentage of size of defect in both groups (n = 152)

<table>
<thead>
<tr>
<th>Size of defect (mm)</th>
<th>Palatal rotational flap (n = 76)</th>
<th>Buccal advancement flap (n = 76)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – 5</td>
<td>33 (43.4%)</td>
<td>34 (44.8%)</td>
</tr>
<tr>
<td>6 – 10</td>
<td>32 (42.2%)</td>
<td>35 (46%)</td>
</tr>
<tr>
<td>11 – 15</td>
<td>8 (10.5%)</td>
<td>6 (7.9%)</td>
</tr>
<tr>
<td>16 – 20</td>
<td>3 (3.9%)</td>
<td>1 (1.3%)</td>
</tr>
</tbody>
</table>

### Table No.3: Frequency and success rate in both groups (n = 152)

<table>
<thead>
<tr>
<th>Success</th>
<th>Palatal rotational flap (n = 76)</th>
<th>Buccal advancement flap (n = 76)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>70 (92.1%)</td>
<td>65 (85.5%)</td>
<td>0.198</td>
</tr>
<tr>
<td>No</td>
<td>6 (7.9%)</td>
<td>11 (14.5%)</td>
<td></td>
</tr>
</tbody>
</table>

### DISCUSSION

In the present study, was more common in males than females. The male to female ratio was 1.7:1. Galíndez et al also reported it to be higher in males. In the literature it was showed that the incidence of oroantral fistula is significantly higher in males with a male to
its success. Due to adequate thickness of the flap the artery is less vulnerable to damage. The sulcus depth is maintained but denuded palatal bone pain and secondary epithelization are the negative aspects.\(^1\)

Palatal stent is recommended after palatal rotational flap operations. This stent reduces the edema and also help the flap to stabilize in this new area. The stent should be passive otherwise the pressure of the stent may result in flap ischemia.\(^1\)

Comparing the success rate of both the flap, in our study the defect size small and medium size flap both the flaps were successful while more defect more than 1cm (10mm) cases of the dehiscence were reported in buccal advancement flap (P=.002), which is statistically significant. Omer\(^10\) also reported similar findings which correlate with our study that for small and medium size defects buccal advancement flap shows less failure rate, more than 1cm OAF defect, buccal advancement flap is not much feasible. In our study defect more than 1cm palatal rotation flap was more successful considerably less failure rate. Overall success rate between both the flaps there was no significant difference (P=0.198) statistically in our study, which correlates to Qureshi et al\(^9\) considering less failure rates in palatal rotation flap. Kale et al\(^9\) concluded that buccal advancement flap is best for small and medium fistulae while for larger defects of OAF, palatal rotation flap is best for larger defects which correlates to our study (p=0.002 in stratification). Similar findings were also reported in other literature.\(^3\)

**CONCLUSION**

This study represent that both palatal rotation flaps and Buccal advancement flap are good surgical options with the palatal rotation flap having a considerably less failure rate s compared to buccal advancement flap as compared to the defect size width. It can be concluded that both flaps are reliable options for the OAF closure. The buccal advancement flap is good option for the small and medium size defects while palatal rotation flap can be used for larger defects, considering less failure rate overall.

**Author’s Contribution:**

- Concept & Design of Study: Muhammad Aamir, Farhad Ali, Arshad Abbas
- Drafting: Muhammad Aamir, Farhad Ali
- Data Analysis: Muhammad Aamir, Farhad Ali, Arshad Abbas
- Revisiting Critically: Muhammad Aamir
- Final Approval of version: Muhammad Aamir

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**REFERENCES**


Alterations in the Serum Lipoproteins of Primiparous Females Suffering from Eclampsia and its Comparison with Normal Pregnant Females

Afia Alam¹, Arfa Alam Buzdar² and Tehreem Alam Buzdar³

ABSTRACT

Objective: To assess the alterations in the serum lipoproteins in primiparous females suffering from eclampsia and its comparison with the normal healthy female pregnancy.

Study Design: Observational / analytical study.

Place and Duration of Study: This study was conducted at the Department of Gynaecology, Teaching Hospital Ghazi Khan Medical College, Dera Ghazi Khan from January 2019 to September 2019.

Materials and Methods: This transverse research work carried out on 50 primiparous patients of eclampsia and 15 pregnant females with normal blood pressure. The record of the history of every female was maintained on questionnaire. Utilization of standard methods carried out for the measurement of the blood pressure. We collected a blood sample of 5 milliliter from every participant to examine the level of serum lipoproteins.

Results: Average age of hypertensive females was 20.18±0.50 years whereas average age of the healthy controls was 21.80±1.14 years. We found a significant difference in the level of lipoproteins. Women present with eclampsia had 26.70%, 27.40%, 29.0%, 30.80% and 63.20% high low density lipoprotein cholesterol, triglycerides, ratio between total cholesterol and high density lipoprotein cholesterol, ratio of low density lipoprotein cholesterol to high density lipoprotein cholesterol and ratio of triglycerides and high density lipoprotein cholesterol correspondingly as compared to the group of healthy controls. The concentrations of high density lipoprotein cholesterol, ratio between high density lipoprotein cholesterol and low density lipoprotein cholesterol and level of apolipoprotein A-I were 24.80%, 54.50% and 25.80% respectively, less in the group of patients as compared to the group of healthy controls.

Conclusion: The assessment of the concentration of serum lipoprotein in the duration of antenatal period can be beneficial in early identification and prevention of the development of eclampsia.

Key Words: Primiparous, Pregnancy, Assessment, Alterations, Pressure, Eclampsia

INTRODUCTION

Eclampsia is very complicated multi-system hypertensive abnormality present in whole world in the duration of late pregnancy. This complication is also a leading cause of high rate of morbidity of mothers as well as fetal.¹

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

Eclampsia has a sudden onset therefore, it is a dangerous anomaly in pregnancy. This complication has the features for the development of the colonic seizures in persons already suffering from preeclampsia. Risk of the development of the pregnancy-induced hypertension increases with increase in age.² This complication has association with the dysfunction and hypoxia of placenta.³ It characterization carried out by blood pressure of 140/90 mmHg or increase in systolic blood pressure (SBP) of greater than 30.0 mmHg or diastolic blood pressure of greater than 15.0 mmHg after 20 gestational weeks along with proteinuria ≥ 300.0mg per 24 hours or higher or equal to 1+ or 100.0 mg /dl by dipstick response.⁴,⁵ Preeclampsia normally occurs in the period of 2nd or 3rd trimester of pregnancy and this problem is more frequent with the 1st pregnancy of females in nulliparous. About 7.0% to 10.0% pregnancies are complicated by pregnancy induced hypertension in the countries which are under-development.⁶ The rate of incidence of pregnancy-induced hypertension in India is
15.20%, and this incidence is 4 times greater in the nulliparous females as compared to the in multipara. In Berhampur, maternal mortalities because of pregnancy-induced hypertension was 32.0% which is two time greater than the rate of incidence present in India. In Nigeria, rate of prevalence is high in the North regions of country with incidence rate of 17.0% and it is responsible for 40.0% maternal mortalities. Most of the affected are the females of teenage because of early marriages in that country. In Pakistan, the rate of incidence of eclampsia is about 19.0%. A research performed in Peshawar, Pakistan stated the rate of maternal mortality because of eclampsia as 16.70% that accounted for 29.40% of total maternal mortalities in the duration of one-year period. Some studies documented the alterations in the level of lipoproteins in hypertension. There is increase in the serum lipids in the period of pregnancy and it is elevated 2 times in pregnancy-induced hypertension. Abnormal concentrations of lipoprotein are accountable for damages to endothelium which can lead to high BP as well as proteinuria and these two are vital signs of pregnancy induced hypertension. The alterations in the concentration of lipoproteins cause damages to endothelium, atherosclerosis and other diseases of heart. Main sign of pregnancy-induced hypertension is the hypertension, this is because of the vasospastic incidents in uterus, brain and placenta. This research work carried out to compare the alterations in the serum lipoprotein of healthy pregnant females and primiparous females suffering from eclampsia.

MATERIALS AND METHODS

This study carried out on the pregnant females who got admission in the Gynecology Department of Teaching Hospital Ghazi Khan Medical College, Dera Ghazi Khan from 5th January 2019 to 20th September 2019. There were 65 females with pregnancy comprising 15 normotensive primiparous females and 50primiparous females suffering from eclampsia at age of gestation of greater than 20 weeks in this research work. We took the written consent from the participants of this research work after explaining them the purpose of this research work. Ethical committee of the institute gave the permission to conduct this research work. Females from both groups present with history of DM (Diabetes Mellitus), Hypertension, renal diseases, disorders of liver, multiple pregnancies, females with history of eclampsia in their family and history of utilization of various drugs influencing the lipid levels for treatment got exclusion from this research work. We included the primiparous pregnant females of eclampsia with gestational age of greater than twenty weeks. The diagnosis of the patients of eclampsia carried out with the presence of persistent hypertension (140.0/90.0 mmHg or higher), proteinuria (identified by the heat test of urine) without or with edema. We collected the history of every patient and used standard methods for the measurement of blood pressure of every patient. We obtained the five-milliliter blood from every participant of both groups. We transferred all the specimens on ice cubes for further investigation in the research laboratory of the institute. The measurement of serum triglycerides and Total Cholesterol carried out with the utilization of enzymatic method of Elitech diagnostic kits made up of France. The measurement of serum high density Lipoprotein-Cholesterol carried out with the utilization of the Merck Diagnostics kits made up of Germany. We used the T-test for the determination of statistical significance. SPSS-20 was in use for the statistical analysis of collected information.

RESULTS

Average age and mean gestational age of the pregnant females in both groups were comparable. Systolic blood pressure and diastolic blood pressure of group of patients was much increased and it was much significant when compared with the group of controls (Table-1)

Table No.1: Comparison of different variables of primiparous pregnant women with the control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>20.18±0.50</td>
<td>21.80±1.14</td>
<td>NS</td>
</tr>
<tr>
<td>Gestation age (weeks)</td>
<td>29.54±0.48</td>
<td>28.71±1.0</td>
<td>NS</td>
</tr>
<tr>
<td>Systolic BP (mmHg)</td>
<td>156.69±2.72</td>
<td>113.13±2.03</td>
<td>0.001</td>
</tr>
<tr>
<td>Diastolic BP (mmHg)</td>
<td>103.49±2.0</td>
<td>74.02±1.52</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Average levels of blood lipid in the females with normal pregnancy and in primiparous females suffering from eclampsia are available in Table-2. There were significant differences available in serum high density lipoprotein cholesterol (P<0.0010), very low density lipoprotein cholesterol (P<0.0010), triglycerides (P<0.0010), total cholesterol and high density lipoprotein cholesterol ratio (P<0.0010), serum triglycerides and high density lipoprotein cholesterol ratio (P<0.0010), ratio of high density lipoprotein cholesterol and very low density lipoprotein cholesterol (P<0.010) and level of apolipoprotein A1 (P<0.0010) among both groups. But we found significant disparity (P<0.050) in total cholesterol, low density lipoprotein cholesterol, level of apolipoprotein B-100, ratio of low-density lipoprotein to apolipoprotein B-100 and ratio of high-density lipoprotein and level of apolipoprotein A-1 in the patients suffering from eclampsia and healthy females with pregnancy. Females suffering from...
Rise of the serum lipids in the duration of pregnancy period and hypertension induced by pregnancy have been stated in many researches works. Remarkably great alterations have been recorded in the triglycerides, which may go as high as 2 to 3 times in last three months of pregnancy period. We noticed the same pattern in this current research work where a significant increase in serum triglycerides was noticed in eclampsia patients when its comparison carried out with females having normal pregnancy. The hyperoestrogenic pregnancy state is mainly accountable for this increase in the level of triglycerides in the period of pregnancy. Estrogen is the cause of induction of hepatic biosynthesis of endogenous triglycerides which is carried by the very low-density lipoprotein. Enhanced level of triglycerides, discovered in pregnancy inducted hypertension is expected to be deposited in susceptible vessels, like the spiral arteries of uterine and contribute to the dysfunction of endothelium, through the creation of small and dense low-density lipoprotein. Mohanty in his research discovered a significant rise in the cholesterol of serum in toxemia of pregnancy in primiparous pregnant females. The results of current research work are contrary to mentioned outcomes where concentration of cholesterol increased up to a certain amount but no significant change in the level of total cholesterol was examined. These findings of current research work are consistent with the results of other stated research studies. In the current research work, the average level of high-density lipoprotein cholesterol was approximately 24.0% low in the patients suffering from eclampsia as compared to the females having normal pregnancy (P<0.0010). Some other research works also reported the similar findings.

In current research work, change in the low density lipoprotein cholesterol was not much significant in the participants of both groups but the levels of serum very low density lipoprotein cholesterol increased significantly (P<0.0010) in pregnant females suffering from eclampsia, which may be because of the hypertriglyceridemia causing increase entry of very low density lipoprotein that carries the endogenous triglycerides into the circulation. The levels of very low-density lipoprotein cholesterol as reported by some other research works might increase to 2.50 folds at term over the level before pregnancy. Level of very low-density lipoprotein further increase in case of eclampsia as discovered in this current research work and as stated by some other research works. In the present research work, the concentration of APO B-100 reduced in the group of patients, but it was not much significant. There was a significant reduction was recorded in the ratio between high density lipoprotein cholesterol & very low-density lipoprotein cholesterol in the group of pregnant females suffering from eclampsia as compared to the pregnant females with normal pregnancy. These findings of current research

**DISCUSSION**

Eclampsia were present with 26.70%, 27.40%, 29.0%, 30.80% and 63.20% high low density lipoprotein cholesterol, triglycerides, ratio of total cholesterol and high density lipoprotein cholesterol, ratio of low density lipoprotein cholesterol and very high density lipoprotein cholesterol and ratio of triglycerides and high density lipoprotein cholesterol respectively in comparison with the group of healthy pregnant females. The concentrations of high-density lipoprotein cholesterol, ratio of high-density lipoprotein cholesterol and very low-density lipoprotein cholesterol and level of apolipoprotein A-1 were 24.80%, 54.50% and 25.80% respectively, low in the group of patients as compared to their healthy controls (Table 2).

**Table No.2: Comparison of lipoprotein concentrations in primiparous women with eclampsia and normal pregnancy**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Eclampsia group Mean±SEM</th>
<th>Control group Mean±SEM</th>
<th>% deviation from control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol (mg/dL)</td>
<td>211.51±4.74</td>
<td>204.18±14.37</td>
<td>3.4 ✌</td>
<td>NS</td>
</tr>
<tr>
<td>HDL cholesterol (mg/dL)</td>
<td>38.62±1.06</td>
<td>51.10±2.34</td>
<td>21.3 ⬆</td>
<td>0.001</td>
</tr>
<tr>
<td>LDL cholesterol (mg/dL)</td>
<td>107.45±4.27</td>
<td>104.45±12.35</td>
<td>2.4 ✌</td>
<td>NS</td>
</tr>
<tr>
<td>VLDL cholesterol (mg/dL)</td>
<td>63.02±3.41</td>
<td>40.0±3.47</td>
<td>43.0 ✌</td>
<td>0.001</td>
</tr>
<tr>
<td>Triglyceride (mg/dL)</td>
<td>325.88±15.68</td>
<td>221.0±15.77</td>
<td>44.0 ✌</td>
<td>0.001</td>
</tr>
<tr>
<td>APO-A1 (mg/dL)</td>
<td>141.49±3.75</td>
<td>187±9.21</td>
<td>22.0 ⬆</td>
<td>0.001</td>
</tr>
<tr>
<td>APO-B100 (mg/dL)</td>
<td>116.88±2.86</td>
<td>124.0±3.15</td>
<td>5.60 ⬆</td>
<td>NS</td>
</tr>
<tr>
<td>TC: HDL-C ratio</td>
<td>5.28±0.09</td>
<td>3.85±0.26</td>
<td>34.0 ⬆</td>
<td>0.001</td>
</tr>
<tr>
<td>LDL-C: HDL-C ratio</td>
<td>2.67±0.06</td>
<td>2.0±0.19</td>
<td>31.0 ⬆</td>
<td>0.01</td>
</tr>
<tr>
<td>Triglycerides: HDL-C ratio</td>
<td>6.28±0.40</td>
<td>4.31±0.33</td>
<td>88.0 ✌</td>
<td>0.001</td>
</tr>
<tr>
<td>HDL-C: VLDL-C ratio</td>
<td>0.62±0.03</td>
<td>1.20±0.09</td>
<td>42.6 ⬆</td>
<td>0.001</td>
</tr>
<tr>
<td>LDL: APO-B100</td>
<td>0.89±0.06</td>
<td>0.85±0.04</td>
<td>4.2 ✌</td>
<td>NS</td>
</tr>
<tr>
<td>HDL: APO-A1</td>
<td>0.21±0.02</td>
<td>0.18±0.03</td>
<td>8.5 ✌</td>
<td>NS</td>
</tr>
</tbody>
</table>
work are comparable with the results of one other research study conducted by Enquobahrie. There is not recognition yet about the significance of these ratios in the duration of pregnancy and prevalence of eclampsia, however, we cannot ignore the significance of changed ratio of serum lipids as these ratios point to some additional risks in the patients of eclampsia with pregnancy.

**CONCLUSION**

The assessment of the concentration of serum lipoprotein in the duration of antenatal period can be beneficial in early identification and prevention of the development of eclampsia.

**Author’s Contribution:**

Concept & Design of Study: Afia Alam

Drafting: Afia Alam Buzdar

Data Analysis: Tehream Alam Buzdar

Revisiting Critically: Afia Alam, Afra Alam Buzdar

Final Approval of version: Afia Alam

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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**Frequency of Hepatitis B and Hepatitis C Seropositivity Among Repeatedly Transfused Thalassemic Children**

Amna Mateen¹, Raja Imtiaz Ahmed¹, Muhammad Abdul Quddus², Rizwan Saeed Kiani² and Sheikh M Taqqi Anwar²

**ABSTRACT**

**Objective:** To determine the frequency of Hepatitis B and Hepatitis C seropositivity among repeatedly transfused thalassaemic children at a tertiary care hospital in Punjab.

**Study Design:** Cross sectional study

**Place and Duration of Study:** This study was conducted at the Department of Paediatrics, Poonch Medical College Rawalakot from March 2016 to September 2016.

**Materials and Methods:** This study involved 300 children of both genders aged between 2-12 years presenting with beta-Thalassemia Major having ≥10 transfusions at the time of presentation. A written informed consent was taken from parents of each patient before they underwent laboratory testing for hepatitis B and C. Various social and demographic factors were also related with the seropositivity of both the viruses.

**Results:** Mean age of the patients were 6.95±3.19 years. There were 169 (56.3%) male and 131 (43.7%) female patients in the study group. The number of transfusions ranged from 10 to 149 with a mean of 70.55±39.31. 31 (10.3%) children were seropositive for hepatitis B. The frequency of Hepatitis B seropositivity increased significantly with increasing age of the patient and number of transfusions. 128 (42.7%) children were seropositive for hepatitis C. The frequency of Hepatitis C seropositivity increased significantly with increasing age of the patient and with increasing number of transfusions.

**Conclusion:** The frequency of Hepatitis B and C seropositivity was found to be 10.3% and 42.7% respectively among repeatedly transfused thalassaemic children presenting at a tertiary care hospital in Punjab. The frequency increased significantly with increasing age of the patient and number of transfusions received before presentation.

**Key Words:** β-Thalassaemia Major, Blood Transfusions, Hepatitis B, Hepatitis C


**INTRODUCTION**

Thalassemia’s are inherited disorders characterized by abnormal production of haemoglobin and are associated with low haemoglobin production and excessive destruction of red blood cells. Pakistan has the highest number of children with transfusion dependent thalassemia in the world due to high frequency of the gene, consanguineous marriages, high birth rate, and large population size¹.

It has been estimated that over 4000 cases of transfusion dependent β-thalassemia major are born in Pakistan per year.²

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

The average life expectancy of β-thalassemic patients in Pakistan is 10 years. This life expectancy has improved due to availability of multiple transfusions along with chelation therapy³,⁴. However, these transfusions do have their side effects which vary from minor blood transfusion reaction to transmission of infections mainly Hepatitis B and Hepatitis C which is prevalent in the sub-continent⁵.

Shaker et al. (2011) reported the frequency of Hepatitis C seropositivity to be 25% in repeatedly transfused thalassemia patients at a tertiary hospital in Egypt. Boroujerdnia et al. (2009) in Iran and Vidja et al. (2011) in India reported this frequency to be 28.1% and 2% respectively⁶.⁷⁸

Yonus et al. (2004) reported Hepatitis-C seropositivity in 42% of repeatedly transfused thalassemic patients in Islamabad, Pakistan³. Similar frequency was reported by Nazir et al. (2014) who observed Hepatitis-C seropositivity in 41% of repeatedly transfused thalassemic patients in Lahore, Pakistan⁵. Hussain et al. (2008) in Peshawar, Sadiq et al. (2013) in Sargodha and Sheikh et al. (2015) in Multan reported this frequency to be 41.7%, 54.2% and 68.2% respectively in repeatedly transfused thalassemic patients⁵⁹. However, comparatively lower frequency has been reported by
Comparatively the reported frequency of Hepatitis B seropositivity is lower as compared to hepatitis C being 2% in India and 1.25% in Karachi, 2% in Peshawar, 3.5% in Multan and 9.2% in Sargodha [6,10-13]. However, much higher frequency (32.5%) has been reported in Egypt [4]. Thus both the hepatitis B and C are frequent among repeatedly transfused thalassemia patients. Compared to India (2%) which is much similar in geographical, population and socio-economic aspects, the frequency of Hepatitis C among thalassemic patients reported in Pakistan (41% - 68.2%) is alarmingly higher [6,7,10-13]. Also there is great degree of disparity among local studies where the frequency of Hepatitis B varies from as low as 1.25% in Karachi to 9.2% in Sargodha [10,12]. A similar disparity is also observed about the frequency of Hepatitis C, which varies from as low as 13% in Peshawar to 68.2% in Multan [11,13]. An important preventable cause behind this is the poor screening efficacy of Blood Banks dealing with such transfusions. This can partially explain the variability observed in previous studies about the frequency of Hepatitis C and B.

At the moment, only a single study is available reporting the frequency of Hepatitis C among repeatedly transfused thalassemia patients at a tertiary care hospital in Lahore while the frequency of Hepatitis B is still undetermined [6]. Furthermore, keeping in view the variation in the existing literature from different hospitals, there is need to determine the frequency of hepatitis B and C in repeatedly transfused thalassemia patients at another tertiary care hospital which will provide local baseline statistical data and will give an insight of disease burden among local thalassaemic population.

**MATERIALS AND METHODS**

This cross-sectional study was conducted at Department of Paediatrics, Poonch Medical College Rawalakot from March 2016 to September 2016. Sample size of 300 cases was calculated with 95% confidence level, 5% margin of error while taking expected frequency of Hepatitis B seropositivity to be 9.2% in repeatedly transfused thalassemic children in Pakistan [10]. Patients were selected by Non-Probability, Consecutive Sampling. Children of any gender aged between 2-12 years diagnosed of β-Thalassemia Major having received repeated blood transfusions were included in the study. Children of Hepatitis B or Hepatitis C positive mothers (antenatal record of the mother) were excluded from the study.

Diagnosis of thalassemia was made upon patients having repeated blood transfusions (≥10) and haemoglobin electrophoresis reporting 100% HbF (foetal haemoglobin). Children with history of ≥10 transfusions since birth (as per history and clinical record). 3ml of blood was acquired by venepuncture from cubital fossa. The sample was allowed to clot and a separate third generation ELISA kit for Hepatitis B and C was used to determine seropositivity from the isolated serum of sample. An immediate single line (≤5sec) was marker of accurate test and a double line with in 5 minutes was taken as marker of seropositivity.

300 pediatric patients presenting in the outdoor of Department of Pediatric Medicine, Children Hospital, Lahore who met the inclusion criteria were enrolled into this study. Detailed history and written informed consent were obtained from the patient’s attendants. 3 ml of blood was taken by venipuncture from cubital fossa and seropositivity for hepatitis B and C was checked. Patient’s demographic details along with number of transfusions and seropositivity for hepatitis B and C was noted and recorded into the attached proforma. All the samples and tests were performed by a single resident to eliminate bias. Confounding variables were controlled by exclusion.

All the collected data was entered and analyzed through SPSS version 21. Numerical variables; age and number of transfusions have been presented by mean ±SD. Categorical variables i-e gender and seropositivity for Hepatitis B and Hepatitis C have been presented by frequency and percentage. Data has been stratified for age, gender and number of transfusions to address effect modifiers. Post stratification chi-square test has been applied taking p≤0.05 as significant.

**RESULTS**

Mean of the study participants was 6.95±3.19 years. There were 169 (56.3%) male and 131 (43.7%) female patients in the study group. The number of transfusions ranged from 10 to 149 with a mean of 70.55±39.31. Majority (n=112, 37.4%) of the children had 51-100 transfusion as the time of presentation followed by 109 (36.3%) children who had received 10-50 transfusions. Only 79 (26.3%) children had ≥100 transfusions. All these findings have been summarized in Table 1.

**Table No.1:** Baseline Characteristics of Study Sample

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Participants n=300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>6.95±3.19</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
</tr>
<tr>
<td>2-5 years</td>
<td>111 (37.0%)</td>
</tr>
<tr>
<td>6-9 years</td>
<td>108 (36.0%)</td>
</tr>
<tr>
<td>10-12 years</td>
<td>81 (27.0%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>169 (56.3%)</td>
</tr>
<tr>
<td>Female</td>
<td>131 (43.7%)</td>
</tr>
<tr>
<td>Number of Transfusions</td>
<td>70.55±39.31</td>
</tr>
<tr>
<td>10-50</td>
<td>109 (36.3%)</td>
</tr>
<tr>
<td>51-100</td>
<td>112 (37.4%)</td>
</tr>
<tr>
<td>101-146</td>
<td>79 (26.3%)</td>
</tr>
</tbody>
</table>
31 (10.3%) children were seropositive for hepatitis B. The frequency of Hepatitis B seropositivity increased significantly with increasing age of the patient; 2-5 vs. 6-9 vs. 10-12 years (6.3% vs. 9.3% vs. 17.3%; p=0.043) and with increasing number of transfusions; 10-50 vs. 51-100 vs. 101-146 (6.4% vs. 8.9% vs. 17.7%; p=0.035). However, there was no significant difference among male (9.5% vs. 11.5%; p=0.576) and female gender. All these findings have been summarized in Table 2. 128 (42.7%) children were seropositive for hepatitis C.

Table No.2: Frequency of Hepatitis B Seropositivity

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Hepatitis B Seropositivity n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>31 (10.3%)</td>
<td>-</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 2-5 years</td>
<td>7/111 (6.3%)</td>
<td></td>
</tr>
<tr>
<td>- 6-9 years</td>
<td>10/108 (9.3%)</td>
<td>0.043*</td>
</tr>
<tr>
<td>- 10-12 years</td>
<td>14/81 (17.3%)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>16/169 (9.5%)</td>
<td></td>
</tr>
<tr>
<td>- Female</td>
<td>15/131 (11.5%)</td>
<td>0.576</td>
</tr>
<tr>
<td>Number of Transfusions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 10-50</td>
<td>7/109 (6.4%)</td>
<td></td>
</tr>
<tr>
<td>- 51-100</td>
<td>10/112 (8.9%)</td>
<td>0.035*</td>
</tr>
<tr>
<td>- 101-146</td>
<td>14/79 (17.7%)</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square test, * Observed difference was statistically significant

Table No.3: Frequency of Hepatitis C Seropositivity

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Hepatitis C Seropositivity n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>128 (42.7%)</td>
<td>-</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 2-5 years</td>
<td>37/111 (33.3%)</td>
<td></td>
</tr>
<tr>
<td>- 6-9 years</td>
<td>49/108 (45.4%)</td>
<td>0.029*</td>
</tr>
<tr>
<td>- 10-12 years</td>
<td>42/81 (51.9%)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>74/169 (43.8%)</td>
<td>0.656</td>
</tr>
<tr>
<td>- Female</td>
<td>54/131 (41.2%)</td>
<td></td>
</tr>
<tr>
<td>Number of Transfusions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 10-50</td>
<td>36/109 (33.0%)</td>
<td></td>
</tr>
<tr>
<td>- 51-100</td>
<td>50/112 (44.6%)</td>
<td>0.019*</td>
</tr>
<tr>
<td>- 101-146</td>
<td>42/79 (53.2%)</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square test, * Observed difference was statistically significant

The frequency of Hepatitis C seropositivity increased significantly with increasing age of the patient; 2-5 vs. 6-9 vs. 10-12 years (33.3% vs. 45.4% vs. 51.9%; p=0.029) and with increasing number of transfusions; 10-50 vs. 51-100 vs. 101-146 (33.0% vs. 44.6% vs. 53.2%; p=0.019). However, there was no significant difference among male (43.8% vs. 41.2%; p=0.656) and female gender. All these findings have been summarized in Table 3.

DISCUSSION

Thalassemias are inherited disorders characterized by abnormal production of hemoglobin and are associated with low hemoglobin production and excessive destruction of red blood cells. Pakistan has the highest number of children with transfusion dependent thalassemia in the world due to high frequency of the gene, consanguineous marriages, high birth rate, and large population size. The average life expectancy of β-thalassemic patients in Pakistan is 10 years. This life expectancy has improved due to availability of multiple transfusions along with chelation therapy. These transfusions do have their side effects which vary from minor blood transfusion reaction to transmission of infections mainly Hepatitis B and Hepatitis C which is prevalent in the sub-continent.

However, there was great disparity in the existing evidence on the frequency of Hepatitis B and Hepatitis C seropositivity among transfused thalassemic children receiving repeated transfusions which necessitated the present study. The objective of this study was to determine the frequency of Hepatitis B and Hepatitis C seropositivity among repeatedly transfused thalassemic children at a tertiary care hospital in Punjab. It was a cross sectional study conducted at Department of Pediatric Medicine, Children Hospital, Lahore over 6 months after the approval of synopsis from 04/03/2016 to 03/09/2016. This study involved 300 children of both genders aged between 2-12 years presenting with beta-Thalassemia Major having ≥10 transfusions at the time of presentation. A written informed consent was taken from parents of each patient.

The age of the patients ranged from 2 years to 12 years with a mean of 6.95±3.19 years. A similar mean age among repeatedly transfused thalassemic children has been reported previously by Hussain et al. (6.8±3.6 years), Younas et al. (6.5±4.8 years), Sadiq et al. (6.3±3.30 years) and Sheikh et al. (6.21±3.07 years) in local population. Nazir et al. (7.8±4.4 years) and Ansari et al. (8.45±6.42 years) reported relatively higher mean age among repeatedly transfused thalassemia children.

There were 169 (56.3%) male and 131 (43.7%) female patients in the study group giving a male to female ratio of 1.3:1. Khattak et al. (55.29% vs. 44.71%) reported a similar male predominance with a male to female ratio of 1.24:1. Yonus et al. reported a much higher male to female ratio of 1.8:1 at Pakistan Institute of Medical Sciences, Islamabad. Hussain et al. rather reported a female predominance (48.0% vs. 52.0%) among repeatedly transfused thalassemic children at Pakistan Institute of Medical Sciences Islamabad.
The number of transfusions ranged from 10 to 149 with a mean of 70.55±39.31. Sheikh et al. reported a similar mean number of transfusions (73.92±50.22) among such patients at The Children’s Hospital Multan. 31 (10.3%) children were seropositive for hepatitis B. Our results are in line with those of Sadiq et al. who reported the frequency of Hepatitis B seropositivity to be 9.2% in repeatedly transfused thalassemic children at Combined Military Hospital Sargodha. Comparatively lower frequency of Hepatitis B seropositivity has been reported in a number of other studies at other thalassemia centres; 2% in India and 1.25% in Karachi, 2% in Peshawar and 3.5% in Multan while much higher frequency (32.5%) has been reported in Egypt. The frequency of Hepatitis B seropositivity increased significantly with increasing age of the patient; 2-5 vs. 6-9 vs. 10-12 years (6.3% vs. 9.3% vs. 17.3%; p=0.043). A similar association with increasing age has been described previously by Sheikh et al. (none vs. 0.7% vs. 2.8%) . A possible explanation for this increase can be increased number of transfusions over time increasing the risk of exposure evident from the fact that the frequency of Hepatitis B seropositivity also increased significantly with increasing number of transfusions; 10-50 vs. 51-100 vs. 101-146 (6.4% vs. 8.9% vs. 17.7%; p=0.035).

128 (42.7%) children were seropositive for hepatitis C. Our results are similar to those of Yonus et al. (42%), Nazir et al. (41%) and Hussain et al. (41.7%) who also reported similar frequency of Hepatitis C seropositivity among repeatedly transfused thalassemia children in local population. Sadiq et al. and Sheikh et al. reported relatively higher frequency of 54.2% and 68.2% respectively. However, comparatively lower frequency has been reported by Ansari et al. (2012) in Karachi and Hayat et al. (2013) in Peshawar being 13.1% and 13% respectively. The frequency of Hepatitis C seropositivity increased significantly with increasing age of the patient; 2-5 vs. 6-9 vs. 10-12 years (33.3% vs. 45.4% vs. 51.9%; p=0.029). A similar association with increasing age has been described previously by Sheikh et al. (14.1% vs. 37.4% vs. 48.5%) . A possible explanation for this increase can be increased number of transfusions over time increasing the risk of exposure evident from the fact that the frequency of Hepatitis C seropositivity also increased significantly with increasing number of transfusions; 10-50 vs. 51-100 vs. 101-146 (33.0% vs. 42.7% vs. 51.9%; p=0.019).

Thus the frequency of Hepatitis B and C seropositivity was found to be 10.3% and 42.7% respectively among repeatedly transfused thalassemic children presenting at a tertiary care hospital in Punjab. The frequency increased significantly with increasing age of the patient and number of transfusions received before presentation. This increase in frequency with increasing age suggests an association of seropositivity with increasing cumulative risk from increasing number of transfusions and in turn the increasing risk of exposure. This frequency of Hepatitis C seropositivity is alarmingly higher and necessitates effective screening measures at Blood Banks to decrease this complication of transfusion with its associated morbidity and mortality.

CONCLUSION

The frequency of Hepatitis B and C seropositivity was found to be 10.3% and 42.7% respectively among repeatedly transfused thalassemic children presenting at a tertiary care hospital in Punjab. The frequency increased significantly with increasing age of the patient and number of transfusions received before presentation.

Author’s Contribution:

Concept & Design of Study: Amna Mateen
Drafting: Raja Imtiaz Ahmed, Muhammad Abdul Quddus
Data Analysis: Rizwan Saeed Kiani, Sheikh M Taqqi Anwar
Revisiting Critically: Amna Mateen, Raja Imtiaz Ahmed
Final Approval of version: Amna Mateen

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Urethral Catheterization, Still a Dilemma!!
Muhammad Khalid¹, Amjad Ali Siddiqui¹, Muhammad Asif², Muhammad Zulfiqar³, Anjum² and Muhammad Hammad Hassan¹

ABSTRACT

Objective: To highlight the mechanism of iatrogenic urethral injury, lack of skills in catheterization among junior doctors and prevention strategies for urethral injury.

Study Design: Prospective observational analytical cross sectional study.

Place and Duration of Study: This study was conducted at the Urology Department of Tertiary Care Teaching Hospital, Dera Ghazi Khan from February 2019 to February 2020.

Materials and Methods: We recruited 145 male patients referred from emergency & in-patients of this hospital, who had iatrogenic urethral injury due to faulty techniques of insertion or removal of Foley catheter. While the patients who pulled out Foley catheter themselves in altered state of consciousness, <18 years and female patients were excluded. A questionnaire was designed for collecting patient demographics, mechanism of Foley catheter related urethral injury, setting of incidence of urethral injury, grade of healthcare professional performing catheterization & management of injuries.

Results: The ages of the patients ranged from 21 to 80 years, with mean age 64.4 ± 5.2. Out of 145 patients who had iatrogenic urethral injuries related to Foley catheterization, 110 (76%) patients had urethral injury because of Foley balloon inflation in urethra and in 10 (7%) patients Foley catheter was removed without deflating it’s balloon. Whereas 25 (17%) patients had multiple manipulation/Attempts of urethral catheterization which lead to injury. Regarding the grade of health care professional. Out of 145 iatrogenic urethral injuries, 77 (53%) catheterization was performed by house officers, 53 (37%) catheterization by PGR/MO and 15 (10%) by paramedical/nursing staff. The major reasons for catheterization 61 (42%) were measurement of urine output followed by catheterization for urinary retention due to enlarged prostate were 54 (37%).

Conclusion: Urethral catheterization still a dilemma, and associated with iatrogenic urethral injuries which is mostly done by junior doctors explaining their lack of the essential skills and knowledge about technique of catheterization, its removal and penile anatomy. This study highlights the imminent need for more intensive training and better simulation models for UC insertion.

Key Words: Iatrogenic, Urethral Injury, Foley Catheter, Lack of Skills, Prevention of Urethral Injuries

Citation of article: Khalid M, Siddiqui AA, Asif M, Anjum MZ, Hassan MH. Urethral Catheterization, Still a Dilemma!! Med Forum 2020;31(5):30-35.

INTRODUCTION

Indwelling urinary catheters have been an integral part of medical care since the invention of Foley catheter in the 1930s by Frederick Foley who designed a rubber tube with a separate lumen which was and still used to inflate a balloon which holds the Foley catheter to be kept in the urinary bladder. 16% to 25% of hospitalized patients have an indwelling Foley catheter.¹,²,³,⁴ Annually more than five million patients have been inserted Indwelling urinary catheters, 4% in the patients who need care at home to 25% in the patients at hospital.¹ Although Urethral catheterization is a frequently performed urological procedure, it can lead to significant morbidity and even mortality.⁵ Routine insertion of Foleys urethral catheters can be challenging or even difficult in certain conditions e.g. such as urethral strictures, severe phimosis and false passages in urethra that increase the chances of urethral injuries.⁶ Many medical devises are used specifically by a trained personnel but this is not always true in case of Foley catheter where diverse healthcare professionals of all grades and skills e.g. urologist, non-urological physicians, surgeons, interns, postgraduate trainee, paramedical and nursing staff perform the catheter insertion⁷,⁸ Junior doctors specially house officer deals patient more frequently at the first encounter so they should be safe, confident, safe and competent enough at performing Foley catheterization at the end of their training.⁹ A study conducted in a Irish teaching
hospital reported that three quarters of catheterization associated injuries occurred when the procedure was performed by interns. Improper techniques of urethral catheter insertion lead to urethral injury in male patients, which are preventable. However, these iatrogenic injuries often over looked despite that an approximately 0.3% of hospitalized patients suffer these injuries causing significant patient morbidity, cost of treatment and complications. Foley catheter-related urethral injury occurs by diverse mechanisms. To recognize and to prevent them, two main mechanisms found responsible. One of them is Foley catheter insertion and other is removal of it. Significant urethral trauma can occur when the Foley catheter balloon is inappropriately filled in the urethra, which is relatively non-distensible organ, instead of inflation of balloon in urinary bladder; or when the catheter and already filled catheter balloon is accidentally pulled out of the bladder either by patient himself or by untrained medical and paramedical staff without deflation. The incidence of iatrogenic Foley catheter related injuries found to be 6.7/1000 Foley scatheters inserted. An American study reported an incidence of 3.2 cases per all 1000 male admissions to a single hospital. Research in a single institution in Ireland revealed that of 864 inpatient referrals to a urology department, 6% related to urethral injury resulted from male catheterization by clinicians other than urologists. Catheter insertion in males is difficult as structure and length of male urethra may render it vulnerable to injury a fact that remains unrecognized by many health care providers, with added difficulty due to enlarged prostate or urethral stricture being common in males. Iatrogenic urethral injury associated with catheter insertion may have devastating long-term sequelae for example, urethral strictures, leading to difficult catheterization and consequently more chances of injury. What are the ways to manage difficult Foley’s catheterization are not well known, thereby increasing the risk of complication. The proportion of morbidities of iatrogenic injury to urethra, manifesting as penile and perineal pain, bleeding, urinary retention, urinary infection and/or urethral scarring, is not known but it is likely substantial. Moreover, Urethral trauma can result in increased invasive procedures, such as suprapubic catheterization, flexible cystoscopy, urethral dilatation, as well as future difficulty with catheterization/urethral stricture leading to recurrent urinary retention and urinary tract infection.

**MATERIALS AND METHODS**

**Participants Recruitment:** This study was conducted from February 2019 to February 2020 in the urology department of tertiary care teaching hospital Dera Ghazi Khan. After approval of the Local Ethics Committee, we recruited 145 male patients referred from emergency & in-patients of this hospital, who had iatrogenic urethral injury due to faulty techniques of insertion or removal of Foley catheter. While the patients who pulled out Foley catheter themselves in altered state of consciousness, <18 years males and female patients were excluded.

**Data Collection Procedure:** A questionnaire designed to gather data relating to patient demographics, mechanism of Foley catheter related Urethral injury (inadvertently inflation of balloon in urethra, removal of balloon without deflation or multiple attempts of Foley catheterization), setting of injury (urethral injury happened inside the hospital or outside the hospital), grade of healthcare professional performing the Urethral catheter (house officers, medical officers,paramedical/nursing staff) management of urethral catheter injuries and associated complications. Proforma also included information regarding whether it is first catheterization or previously catheterization done and the most common indications of the catheterization were also noted.

The questionnaire was filled by the attending urology doctor by history form patients and his attendants, physical examination, checking the medical record of the patients, discussing with doctor who initially performed urethral catheterization.

At the time of initial evaluation either senior urology medical officers or consultants identified the injury and complications. Standardized definition of iatrogenic UC injuries was used from previously published studies. Urethral catheter insertion injury defined as reported by the physician requesting for consultation of difficult/failed catheter placement with subsequent poor catheter drainage, inability to place a catheter despite repeated attempts, haematuria, along with penile swelling and inadvertently inflating the balloon in the urethra (noticed by urologist). Additionally, certain conditions, as urethral and/or perineal pain, blood at the urethral meatus, a non-draining catheter that could not be irrigated, retrograde/antegrade urethrogram demonstrating urethral trauma and cystoscopic evidence of urethral injury were noted by urology team.

Immediate complication like penile/peri-urethral swelling, urethral bleeding, urinary retention, perineal /penile pain were noted. All patients were managed with empirical broad-spectrum antibiotic. Management strategy was noted as well.

**Data Analysis:** The general descriptive statistics were calculated for all variables of interest, including, age, mechanism of injury, grade of health care professional who performed catheterization, setting of injury, the reason of catheterization, catheterization performed first time or multiple times.
RESULTS

Age: The age of the patients ranged from 21 to 80 years, with mean age of the patients 64.4 ± 5.2.

Mechanism of catheterization leading to injury: Out of 145 patients who had iatrogenic urethral injuries related to Foley catheterization, 110 (76%) patients had urethral injury because of Foley balloon inflation in urethra and in 10 (7%) patients Foley catheter was removed without deflating it’s balloon. Whereas 25 (17%) patients had multiple manipulation/attempts of urethral catheterization.

![MECHANISM OF IATROGENIC URETHRAL INJURY](image)

**Figure No.1: Mechanism of injury**

Setting of incident of urethral injury: Out of 145 iatrogenic urethral injuries, 85 (59%) occurred in emergency patients and 60 (41%) from in-patient. Out of 145 patient with urethral injury for 95 (66%) patients it was their first catheterization whereas 50 (34%) patients had previous history of multiple catheterization. The major reason of catheterization was measuring urine output (n=61, 42%) followed by, for retention due to enlarged prostate (n=54, 37%). Other indications mentioned in table.

<table>
<thead>
<tr>
<th>Table No.1: Setting of incident of urethral injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories</td>
</tr>
<tr>
<td>Catheterization happened in</td>
</tr>
<tr>
<td>Emergency</td>
</tr>
<tr>
<td>Indoor / Inpatient’s</td>
</tr>
<tr>
<td>Catheterization episode</td>
</tr>
<tr>
<td>First time</td>
</tr>
<tr>
<td>Recurrent</td>
</tr>
<tr>
<td>Reason for catheterization</td>
</tr>
<tr>
<td>Retention due to Enlarged prostate</td>
</tr>
<tr>
<td>For measuring urine out put</td>
</tr>
<tr>
<td>Retention due to Vesical stone</td>
</tr>
<tr>
<td>Retention/difficult urination due to Stricture urethra</td>
</tr>
</tbody>
</table>

Grade of health care professional performing urethral catheterization: Out of 145 iatrogenic urethral injuries, house officers did 77 (53%) traumatic catheterization, 53 (37%) injuries by PGR/MO and 15 (10%) by paramedical/nursing staff.

<table>
<thead>
<tr>
<th>Table No.2: Grade of healthcare professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories</td>
</tr>
<tr>
<td>Catheterization process performed by</td>
</tr>
<tr>
<td>House officers</td>
</tr>
<tr>
<td>PGR/MO</td>
</tr>
<tr>
<td>Para-medical/nursing</td>
</tr>
</tbody>
</table>

Injuries, associated Complications and their management: All patients presented with cluster of symptoms due to urethral injury e.g. urinary retention followed by haematuria/penile bleeding, perineal or periurethral edema and genitalia pain. 122 (84%) patients were managed by placing supra pubic catheter under USG guidance who had absolute urinary retention. Few patients (n= 15/10%) with partial retention or severe difficulty in passing urine were successfully and gently attempted per urethral catheter by a urology team with adequate lubrication and analgesia.

While 8 (6%) Patients have undergone cystoscopy and catheterization as suprapubic catheter was not possible because of low capacity bladder (inadequate bladder filling); where cystoscopy showed false passages.

<table>
<thead>
<tr>
<th>Table No.3: Management of urethral injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories</td>
</tr>
<tr>
<td>Management</td>
</tr>
<tr>
<td>Retr catheterization</td>
</tr>
<tr>
<td>Suprapubic cystostomy</td>
</tr>
<tr>
<td>Cystoscopy &amp; catheterization</td>
</tr>
</tbody>
</table>

During follow up Patients who had supra pubic cystostomy were advised to have retro grade urethrogram after 6 weeks and mostly found to have urethral stricture and for them we have to do internal optical urethrotomy/urethral dilatation. Few patients presented with late complication like recurrent urethritis, epididymorchitis and even prostatitis

**DISCUSSION**

Urethral catherization (UC) is performed routinely in hospital/clinic settings. Approximately 25% patients admitted in hospitals are catheterized during their inpatient stay. The incidence of iatrogenic UC injuries found is 6.7 per 1000 catheters inserted. Total Incidence of 3.2 cases per all 1000 male admitted to
hospital were observed in an American study. In a Polish study, conducted between 1995 and 1999, 32.9% urethral injuries resulted from Foley catheterization.

**Mechanism of injury:** Trauma results from inappropriate or vigorous force applied during Foley catheter insertion, or from inflation of the balloon while still in the urethra or inadvertently removing the catheter without balloon deflation as mention in current study. Although life-threatening complication are uncommon, iatrogenic urethral injury is associated with devastating consequences e.g. urethral strictures, urinary incontinence etc. Males are more commonly affected due to their longer urethra. Wu AK, Alex et al observed that inflation of balloon in urethra have high pressure in the urethra almost two times greater than when the balloon is filled in urinary bladder. As urethra is relatively non distensible organ, as compared to bladder so more injuries happen in urethra. It was also found in their study that balloon pressure is high in the distal part of urethra (e.g. fossa navicularis than proximal urethra). Interestingly, Foley’s balloon with larger filling volumes need more force to extract from the bladder when it is filled completely. It justifies the injury of urethra when inserting catheter incorrectly or removing the catheter without deflation of balloon.

Setting of injury: In current study most Foleys catheterization 85(59%)were done in emergency, where patients are usually attended by junior doctors and paramedics at the very first; It is not uncommon for them to attempt insertion of catheter which if failed then repeated attempts with same or different catheter done, or another doctor tried to insert Foleys catheter. So multiple catheterization attempts leads injury the urothelium, which is a delicate structure being 3 to 4 cell layered only. Repeated unsuccessful attempts cause lots of physical and psychological distress and causing further difficulty in Foley catheterization & future reconstruction as well.

Difficult catheterization also leads to urethral injuries as in case of enlarged prostate & urethral stricture where forceful manipulation or multiple attempts can lead to significant urethral morbidity. As in current study 16 patients (11%) had history of stricture urethra and 54 (37%) patients were catheterized for enlarged prostate, both can lead to difficult catheter insertion & consequently urethral injury.

Similarly Previous catheterization also pose difficulty in Foley catheter insertion leading to multiple or forceful attempts, so more risks of urethral injuries, as in our study 50(34%) patient had history of previous catheterization. Additionally management of iatrogenic urethral injuries involves more invasive procedure like suprapubic cystostomy and even cystoscopy that leads to increase hospital stay and cost of treatment as well.

Grade of health care professional: Insertion of Foley’s catheter is being carried out by different medical staff with variable skills, experience & knowledge about it. We found in current study that Foley catheter insertion done mostly by house officers and post graduate residents(PGRs)/MOs, 77(53%) & 53(35%) respectively of the tertiary hospital, that signifies the lack of anatomical knowledge of male urethra & lack of confidence in skills for insertion catheter. Iatrogenic urethral injuries also done by non doctors, i.e. paramedical /nursing staff. This deficiency leads to urethral injuries and its complications in our study. Lots of published literature discuss about the junior doctor’s attitude, knowledge and skills for Foley’s catheter. An Irish study reported that 864 referral to urology 6% of the urethral injuries were caused by catheterization done by non-urologist physicians. Increasing clinical experience is thought to reduce the chance of causing an iatrogenic UC injury. Interestingly, the current study demonstrated that 53 (35%) UC injuries were caused by PGR or MOs, more experienced grades of doctors who are routinely involved in UC. These findings suggest that correct technique and appropriate training of those routinely involved in these procedures, as well as auditing of iatrogenic injuries with a view to focused training sessions is necessary in the future.

In a recent study at a tertiary care medical centre, concluded that house officers have inadequate supervision, training, confidence and knowledge for Foley catheter insertion and it reflects 74% incidence of iatrogenic urethral injuries by house officers. Several studies observed that junior doctors have low confidence and less exposure while in medical school in inserting Foley’s catheter. This lack of confidence and insufficient experience is reflected by the fact that one in five first-year U.K. interns had never performed male catheterization and nearly half (45%) had never performed a female catheterization after one year of medical practice.

Training or education in surgical subspecialty specially urology is very limited regarding the clinical rotation and at medical college level increased syllabus of medical students doesn’t let the medical students to learn skills in this overlooked subspecialty; that leads to lack of skills during internship. That is why who did not get clinical rotation in urology, obviously will not get skills and knowledge about urethral catheter training. Beside this another hurdle for training that patients are very reluctant to get examined specially their genitals, by junior doctors which is very common specifically in private hospitals. In USA, during a single academic year it was found that there was only a median of nine-third-year medical students got clinical rotation in urology.

**Prevention of the foleys catheterization complications:** Studies on foleys catheterization
to focus on interns and interventions for prevention are usually aimed at this grade of healthcare professional. So at the end of the study prevention strategy was planned to avoid injuries and their morbidity. Most important point of strategy was to plan a formal lecture & videos including anatomy of male urethra along with step by step practical demonstration of catheterization procedure, with particular emphasis on the key points of lubrication, position of the penis and the extent to which a catheter should be inserted. The importance of history taking prior to the insertion should be stressed and conditions and scenarios that are associated with increased risk of urethral injury upon catheterization should be discussed. Hopefully it will decrease the incidence of Foley’s catheter related injuries and associated morbidities.

Literature reviewed emphasised that Foley catheter training should start in medical school so when internship is started which is very hectic and they can’t focus on catheter training, they would be already competent in this skill. Secondly junior doctors and para medicals should be supervised by seniors for proper techniques of catheterization is essential to prevent urethral injuries in patients.

New techniques of Foley urethral catheterization are under survey which include guide wires, urethral balloon dilation, directed hydrophilic mechanical dilators and direct vision endoscopic catheter systems insertion. In view of the significant morbidity caused by Foley’s catheters, there is need to provide a research agenda for developing a safer alternative devised by Davis et al provides a protective mechanism a novel safety syringe catheter to reduce UC injuries by controlling the threshold inflation pressure and is being currently tested in the clinical setting.

CONCLUSION

Urethral catheterization still a dilemma, and associated with iatrogenic urethral injuries, which is mostly done by junior doctors explaining their lack of the essential skills and knowledge about technique of catheterization, its removal and penile anatomy. This study highlights the imminent need for more intensive training and better simulation models for UC insertion. We also emphasize the role for the development of safer urinary catheters in the near future.

Author’s Contribution:

Concept & Design of Study: Muhammad Khalid
Drafting: Amjad Ali Siddiqui, Muhammad Asif
Data Analysis: Muhammad Zulfqar Anjum, Muhammad Hammad Hassan
Revisiting Critically: Muhammad Khalid, Amjad Ali Siddiqui
Final Approval of version: Muhammad Khalid

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

Study of Estimation of Height By Measuring Foot Length

Muhammad Asif¹, Azhar Masud Bhatti², Tanveer Hussain³, Zubia⁴ and Sadaf Nadir⁵

ABSTRACT

Objective: To study of estimation of height by measuring foot length.
Study Design: Correlational and experimental study.
Place and Duration of Study: This study was conducted at the Department of Forensic Medicine, Sialkot Medical College, Sialkot from January 2018 to June 2018.
Materials and Methods: In this study samples size of 163 female were taken. Students were selected through non probability purposive sampling method from students of Sialkot medical college. Data collected was analysed by SPSS version 23. Regression equation helps to estimate height of an individual.
Results: Results indicated that there is strong positive correlation between foot length and height.
Conclusion: Regression equation can be used to estimate height when only foot is available as a result of man or nature caused disaster.
Key Words: Correlation, Height, Foot Length


INTRODUCTION

Height is one of the criteria that helps in shortening the list for individuality. Its estimation is especially helpful in situation where an amputated body part is available. One can estimate the body height from the length of legs, pelvis, vertebral column and skull is summed up to give height of a person. Height varies in different communities as well as various individuals of same community. Correlation of various measurements of different has long been studied and utilized in various fields of life especially arts and forensic scientists. Extensive studies have been made to study prediction of height by measuring length of foot, hand long bones, index finger etc. Ossification and maturation in the foot occurs earlier than the long bones and therefore, during adolescence age, height could be more accurately predicted from foot measurement as compared to that from long bones.

INTRODUCTION

To individualize a disfigured, putrefied and skeletonized body has become an important need of now a days because natural and man caused disasters are being taken place at a greater rate than before. Height of a person relies upon age, ethnicity, social and cultural factors. Height is one of the most widely used body measurement. It not only helps in individuality but also gives information about health of an individual as well as community. There are many advantages to use data of height. It is easily available especially when other criteria is not available for height measurement. Researchers have routinely used height as an indicator for both population health and early life conditions. There are more chances for the availability of foot which is usually covered with shoes from a blast, disaster or air crash.

MATERIALS AND METHODS

It was a correlational study conducted at the department of Forensic Medicine, Sialkot Medical College, Sialkot from January 2018 to June 2018.
Sample Size: According to correlational sample size formula sample size is 62. Which was increased to 163.
Sampling Technique: Females were selected through nonprobability purposive sampling method from students of DPT and H&D and Third year MBBS Sialkot medical college Sialkot. Samples Selection: Inclusion criteria 1) Females. 2) Students. Exclusion criteria: Those having a foot, leg or spinal column defect were not included.
Data Collection: Only female students fulfilling the requirements and were asked to take part in the study. Details of study were explained and after their consent their height was measured from top of head to the heal...
on standing position. Then each foot length from tip of the big toe to the back of heel was measured in centimeters with the help of measuring tape. All measurements were taken from 9 am to 1 pm.

**RESULTS**

The results of correlation and regression indicate that there is strong positive correlation between height and foot length. The value of correlation coefficient between height and right foot length is 0.785 and that between height and left foot length is 0.798. The p value in both cases is less than 0.001 which is far less than 0.05. Coefficient of determination between RFL and height is 0.616 and 0.637 between LFL and height. The descriptive statistics are given in table 1. Correlation between height and Right Foot Length describe in table 2 while correlation between height and Left Foot Length in given table 3.

Table No 1: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
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<th>Min.</th>
<th>Max.</th>
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<th>Std. Deviation</th>
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<td>145.0</td>
<td>179.0</td>
<td>161.144</td>
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<tr>
<td>Right_foot_length</td>
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<td>21.00</td>
<td>29.00</td>
<td>24.1988</td>
<td>1.45054</td>
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<td>21.00</td>
<td>29.00</td>
<td>24.1933</td>
<td>1.45666</td>
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<tr>
<td>Valid N (listwise)</td>
<td>16</td>
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Table No 2: Correlation Between height and Right foot length (RFL)

<table>
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<tr>
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<tbody>
<tr>
<td>Height</td>
<td>Pearson Correlation</td>
<td>.785**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>163</td>
</tr>
</tbody>
</table>

Table No 3: Correlation Between height and Left foot length (LFL)

<table>
<thead>
<tr>
<th></th>
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<th>Left_foot_length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Pearson Correlation</td>
<td>.798**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>163</td>
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</tbody>
</table>

Table No 4. F and T values

<table>
<thead>
<tr>
<th></th>
<th>F value</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>258.64</td>
<td>10.64</td>
</tr>
<tr>
<td>RFL</td>
<td>282.70</td>
<td>16.08</td>
</tr>
<tr>
<td>Constant</td>
<td>10.78</td>
<td></td>
</tr>
<tr>
<td>LFL</td>
<td>16.81</td>
<td></td>
</tr>
</tbody>
</table>

Table No 5: various studies carried out for correlation between foot length and height.

<table>
<thead>
<tr>
<th>Sr. #</th>
<th>Researcher</th>
<th>Value of r between RFL and height</th>
<th>Value of r between LFL and height</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This study</td>
<td>0.785</td>
<td>0.798</td>
</tr>
<tr>
<td>2</td>
<td>Hemy et al 2013</td>
<td>0.70</td>
<td>0.70</td>
</tr>
<tr>
<td>3</td>
<td>Shah et al 15</td>
<td>0.709</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Uhrova et al 15</td>
<td>0.71</td>
<td>0.71</td>
</tr>
<tr>
<td>5</td>
<td>Srivastava and Yadav 14</td>
<td>-</td>
<td>0.71</td>
</tr>
<tr>
<td>6</td>
<td>Agarwal et al 15</td>
<td>0.7025</td>
<td>0.7027</td>
</tr>
<tr>
<td>7</td>
<td>Parish et al 2013</td>
<td>0.696</td>
<td>0.708</td>
</tr>
<tr>
<td>8</td>
<td>Bharti et al 16</td>
<td>0.75</td>
<td>0.729</td>
</tr>
</tbody>
</table>
Figure 1 shows regression equation between height and RFL. Figure 2 shows regression equation between height and LFL.

T value of both coefficients also indicates that all values of coefficients are good for prediction purpose. Similarly F is equal to 258.64 and 282.70 indicating that overall models are good for prediction.

DISCUSSION

Many previous studies have such a strong positive correlation such as studies carried out by ¹²⁻¹⁷,²¹,⁻²⁴. Various studies done in this respect are denoted in table 5 of result. As there is difference between growth rate of males and females so that there is difference between average height so that an equation of regression for females cannot be used for prediction of male height¹⁸. Standard error of estimate is 4.59 and 4.47. The lowerer the SEE the more reliable results will be⁹. It also denotes more accuracy of equation¹⁹,²⁰.

CONCLUSION

The results of this study indicate that regression equation can be used to estimate height of a fragmented body found during disaster or bomb blast.

Author’s Contribution:
Concept & Design of Study: Muhammad Asif
Drafting: Azhar Masud Bhatti, Tanveer Hussain
Data Analysis: Zubia, Sadaf Nadir
Revisiting Critically: Muhammad Asif, Azhar Masud Bhatti
Final Approval of version: Muhammad Asif

Conflict of Interest: The study has no conflict of interest to declare by any author.

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18. Potdar AB, Kiran G, Shrikanthan G, Potdar PA, Mittal A. Correlation of Stature and Foot Length among Medical Students from Southern Parts of


Role of Open Surgical Release of A1 Pulley (Annular) in Treatment of Trigger Finger of Hand
Muhammad Arif¹, Muhammad Asif², Nasreen Hamid³, Rizwan Anwar⁴ and Mohammad Abdul Hanan⁴

ABSTRACT

Objective: To study the effectiveness of surgical incision of A1 pulley in treatment of trigger finger.
Study Design: Observational study.
Place and Duration of Study: This study was conducted at the Department of Orthopedics Islam Medical College of Sialkot during March 2018 to Feb 2019.
Materials and Methods: All patients with Trigger Finger are included in our study which include 50 cases. Our study included patients with trigger finger grade III and above as per Qunitell classification. We noted the profile details including Mean age and Gender and recorded treatment results for statistical analysis using SPSS Version-20.
Results: In our data trigger finger was found in all 50 subjects with 14 males (28% of total patients) and 36 females (72% of total patients). Mostly patients around 26% felt ring finger and thumb trigger digits, 20% felt middle and index finger digits while only 8% felt it in more than one finger. Amongst the males pain was felt in ring finger joint mostly on right side i.e. 36% while females most affected joint was thumb with 63% left side dominance. The Mean success rate recorded was 77%.
Conclusion: Thus the open surgical release of A1 pulley is an effective method for trigger finger management.
Key Words: A1 pulley release, Trigger finger, Qunitell Grading, Visual analogue Scale


INTRODUCTION

A person’s ability to use his hand normally is significantly important and it comprises of proper functioning of hand including strength, sensation and range of motion. Trigger finger is an illness caused from a stenosed digital flexor tendon sheath. In 1850, a French physician Alphonse Notta defined trigger as something caused due to the difference in diameters of a flexor tendon and its retinacular sheath as this sheath thickens and narrows. His report consisted of four case studies involving adult subjects.1 Due to discovery of Alphonse Henri Notta, this tendon nodule is also known to be Notta’s node.

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

Trigger finger is also known as Stenosing flexor tenosynovitis of the digital flexor tendon sheath which happens mainly when there is a misalliance between the flexor tendon and the retinacular pulley system at the first annular (A1) pulley. At the base of the finger, lies the A1 pulley over the metacarpophalangeal (MCP) joint. When the flexor tendon gets inflamed, it damages the ability to slide over the flexor tendon sheath. Up till now no specific cause can be attributed to it although extensive use, sports or repetitive movement of the finger can be a cause.2 Usually this triggering co-exists with other conditions such as diabetes, rheumatoid arthritis, amyloidosis, and carpal tunnel syndrome.3

Among the healthy population meaning non-diabetic or patients with no other condition, trigger finger has a lifetime incidence of 2 to 3%. Trigger finger patients initially present with painless snapping or feeling of complete locking of digits and sometime difficulty in extending digits. Often the pain extends down to the palm. Some may even feel difficulty in holding objects and doing tasks and in severe cases the finger gets locked in one position.

Usually diagnosis includes looking for symptoms of tenderness in the palm over the flexor tendon sheath or swelling of the tendon sheath or trigger feeling as he bend the hand or straightens all fingers. Traditional methods of treating the disease includes changing of the activity splinting, short-term nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroid injection,
and other related therapies.\textsuperscript{4,5} When the non-surgical treatment fails to improve the disease, it’s suggested to opt for surgical treatment which aims to release the A1 pulley that was causing hindrance to the tendon movement thus the flexor tendon easily glides through the tendon sheath. Reported success rate of surgical release of the A1 pulley in a study was 60 to 100\%\textsuperscript{6,7}.

MATERIALS AND METHODS

The detailed study was conducted in Islam Medical College of Sialkot and all patients with Trigger Finger during March 2018 to Feb 2019 are included in our study which included 50 cases. Our data collection team recorded the profile details including age gender and side involved , symptoms and Quintell grading and kept following up for 30-day for clinical assessment and recorded the outcomes post treatment and statistical evaluation and analysis was performed using SPSS Version 20.

In the process, a single experience surgeon is involved to perform the open trigger digit release. Patients were identified with trigger finger grades I to IV according to the Quintell classification grading system and assessed using VAS (Visual analogue Scale) scores pre and post-surgery. Only patients falling under Grade-III (passively correctable) as per Quintell classification system were included.

Exclusion Criteria

- Patients with a history of hand tumor;
- Patients with an immunological disease for instance rheumatoid arthritis;
- Patients with previous surgery or hand trauma condition;
- Patients with a neurologic insufficiency in the same upper extremity.

Inclusion Criteria: All the patients of surgical incision of A1 pulley in treatment of trigger finger were included in this study

First the patient is made to lay in a supine position with his/her arms on his side such that his body and arms are at equal levels. The volar part of the hand is faced upwards and a small incision starting from 1 to 1.5 cm is made on the volar side of the hand centered over the A1 pulley .Thus the hand position increases the accessibility of surgeon to inner neurovascular structures. In case of thumb, the radial nerve is immediately protected for major nerve injury. The A1 pulley is insecure and released longitudinally to the base of pulley. After this flexor tendon is decompressed at the center and distally. As soon as the patient flex and extend the finger to sense no triggering, the injured spot is closed. After the surgery, patients are not requested to keep their hands elevated and prescribed non-steroidal anti-inflammatory drugs (NSAIDs) and icepacks if needed.

RESULTS

A total of 50 patients consisting of 28\% males and 72\% Females were included in the study with the mean age noted to be 36.3 ± 5.042 years where the maximum age documented was 49yrs and minimum was 18 year old. (Table-I).

Table No.1: Demographics

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Variable</th>
<th>Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age ± SD</td>
<td>36.1 ± 5.642</td>
<td>50</td>
</tr>
<tr>
<td>Maximum</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Male to Female</td>
<td>28% : 72%</td>
<td></td>
</tr>
</tbody>
</table>

Figure No.1: Distribution of Patients with Trigger Finger Digits Gender wise
Figure No.2 Quintell Classification of trigger finger patients
Amongst the 50 subjects stage 3 (24%) and Stage IV (26%) while 50% experienced stage V of the stenosing tenosynovitis (shown in Figure-2).
Around 6% were diabetic and 4% had mild rheumatoid arthritis in their clinical history.

Figure No.3: Post-Surgery Success Rate of Patients
Using VAS pre and post-operation, we found 83% female patients were satisfied with the surgery while 71% men were completely satisfied and had average VAS scores decline from 95.2 to 6.91mm after 30 days.(Figure-3).

Figure No.4: Outcomes of Surgical release of A1 Pulley
However 70% wholly improved with no resulting complications while 8% patients felt post-operative pain, 16% required repeat injection and 6% suffered mild skin infection post- surgery. (Figure-4)In the diabetic patients the amount of repeat injection was 33%.

DISCUSSION
Trigger Finger usually results after traumatic inoculation of the flexor tendon sheath using a pathogenic bacterium.\textsuperscript{8,9} The pathology of stenosing tenosynovitis, also known as trigger finger, lies in the disparity between the size of the flexor tendon sheath and its fillings within the first annular (A-1 pulley). Repeated attempts of the tendon to glide through the stenotic sheath ultimately leads to inflammation and the inability to flex or extend the digit smoothly. This initially starts as a clicking that may be painless in nature and may eventually progress to a finger that becomes locked in flexion. This often requires passive manipulation of the pathologic finger into extension. These patients often present with pain localization to the palm, metacarpophalangeal (MCP) or proximal interphalangeal joint (PIP).\textsuperscript{1} Nonsurgical modalities include steroid injection and splinting.\textsuperscript{8} At our center, nonsurgical treatment generally involves local steroid injection assuming the patient has no active osteoarthritis or signs of active infection.\textsuperscript{1,3} If symptoms persist after this period, surgical intervention is strongly considered. The main focus during operative controlling lies in surgical release of the entrapped tendon. A transverse incision is made on the volar aspect of the hand overlying the metacarpophalangeal (MCP) joint and the A1 pulley. Dissection is carried out down to the A1 pulley. Special attention must be paid to the radial and ulnar sides of the pathologic digit to avoid neurovascular injury. The pulley is then divided, freeing the tendon beneath it. Ultimately, the goal of the procedure is complete release of the pulley of the pathologic digit with preservation of all other pulleys and structures.

Around 60 to 97% cases shown improvement by conservative management in a study conducted by Salimet at al.\textsuperscript{10} Similarly patients who reach stage III and above i.e. pass the stage of normal and uneven movement falling into actively correctible to fixed deformity have been reported to fail recovery through conservative management possibly due to the secondary process where within the flexon tendon thickens an hypotrophy occurs which can only be helped by a surgical release of the A1 pulley.\textsuperscript{5,11,12}

In our study the mean age group of patients with trigger finger was 36.38 years with female to male weightage of 72% to 28%

Somewhere else the mean age group of 59yr was observed with female to male patients weightage i.e.
67% vs 33% while a local study concluded 88.8% satisfaction rate of the trigger patients.1,13
In our data frequent triggers were observed in ring and middle fingers i.e. 26% and 20% and 32% in thumb. Thus mostly middle-aged women are most frequently seen suffering from this disease with trigger occurring particularly in the ring and middle fingers and most frequently in thumb.8,14
We reached an average 77% satisfaction rate in trigger finger patients post-surgery however resulting complications were only observed in 6% patients i.e. skin infections. Similar findings were observed with wound infections between 2 to 5% (3, 10). In a reflective study somewhere else conducted on 59 subjects, 97% satisfaction rate was observed in triggering.
Out of the 3 diabetic subjects we had a repeat injection case of 1 while the remaining with pre-arthritis condition had no resulting complication. Some of the patients went through the conservative treatment however as they visited outpatient clinic late, they fell in grade-III category and had to take the surgical treatment.
Finally we believe that surgical treatment is a gold level therapy in spite of all conservative methods including steroid injections.

CONCLUSION
Overall our treatment aims to reinstate the full range of motion and to decrease the pain of the digit. Considering the success rate, open release of A1 pulley is an effective intervention however it results in various post-procedural complications which are very infrequent.

Author’s Contribution:
Concept & Design of Study: Muhammad Arif
Drafting: Muhammad Asif, Nasreen Hamid
Data Analysis: Rizwan Anwar, Mohammad Abdul Hanan
Revisiting Critically: Muhammad Arif, Muhammad Asif
Final Approval of version: Muhammad Arif

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES
Role of Corticosteroid Injection (Methyl Prednisolone Acetate) 40 mg in Treatment of De Quervain’s Disease of Wrist

Muhammad Asif¹, Muhammad Arif², Muhammad Omer Farooq Tanveer¹, Tanveer Haider³, Rizwan Anwar³ and Mohammad Abdul Hanan³

ABSTRACT

Objective: To study the outcome of corticosteroids injections in De Quervain’s disease produces lateral wrist pain and can also cause acute conditions subsequently leading to disabilities. In this condition pain is caused by thumb movement and radial and ulnar deviation of the wrist.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Islam Medical College of Sialkot from January 2018 to January 2019.

Materials and Methods: All patients with De Quervain’s disease are included in our study. This study includes 152 patients. We recorded the tenderness on first dorsal compartment and pain felt on Finkelstein test using Visual analogue scale before and after the treatment fortnightly and within 30 days. We also noted the Mean Age gender wise and recorded treatment results for statistical analysis using SPSS Version-20.

Results: In our data De Quervain’s disease was found in 60 males (33% of total patients) and 92 females (67% of total patients) with a male to female ratio of 1:1.5. The Mean age group recorded was 36.80 ± 4.462 years and a mean Vas score (mm) of 93.9 before injection and 6.38 post-injection was observed with a mean success rate of 89% and significant improvement in pain on the radial side of wrist and we observed a negative Finkelstein test post-injection.

Conclusion: Thus we find that steroid injections assist in significant improvement in De Quervain’s disease and helps in reducing re-occurrence.

Key Words: Corticosteroid injections, De Quervain’s disease, Finkelstein test, Visual analogue Scale

INTRODUCTION

In 1895 a Swiss Surgeon named Fritz de Quervain identified the wrist disease now called as De Quervain’s tenosynovitis or gamer’s thumb or mother’s thumb. He described it as the illness in which the entrapped tendon disturbs the first dorsal compartment of the wrist. In this state the tendon sheaths condense around the abductor pollicis longus and extensor pollicis brevis causing gliding of these tendons in the fibro-osseus tunnel at the radial styloid on lateral side of wrist.

Objective: To study the outcome of corticosteroids injections in De Quervain’s disease produces lateral wrist pain and can also cause acute conditions subsequently leading to disabilities. In this condition pain is caused by thumb movement and radial and ulnar deviation of the wrist. The abductor pollicis longus is multistranded, large tendon and extensor pollicis brevis is small tendon. These tendons are separated by septum and helps in abducting and extending the thumb.

Inflammation of either the tendon sheaths or swelling of the tendon’s called “Tendinosis” causes the pain with thumb movements or radial and ulnar deviation of the wrist. Usually the disease was most common in woman mostly ageing above forty and fifty however it’s still difficult to reason the branching source of it. In most patients it is causes due to injuries in extensor pollicis longus and abductor muscles caused due to repeat movements in wrists for instance lifting infants doing house chores or lifting grocery items or heavy objects, hammering or skiing. Other reasons include pregnancy, diabetes or rheumatoid arthritis.

In order to treat the disease the physician first take the history where usual complains involve pain in moving thumb or pinching or holding objects and then examines physically the soreness of the 1st dorsal compartment at the radial styloid and then performs the Finkelstentest.
In finkelstein test the thumb is first flexed in the palm and fist is made. Then ulnar deviation is made by examiner at patient wrist which produces sharp pain in the distribution of the tendon’s proximally in the forearm and distally in the hand.

In the end the aim is to treat the patient with either non-surgical or surgical interventions which includes splints, anti-inflammatory medications and use of corticosteroid injections or surgeries. In our study we are observing outcomes of treating patients with corticosteroid injection which has been known to provide significant improvements in wrist.

MATERIALS AND METHODS

The detailed study was conducted in the Department of Orthopedic, Islam Medical College of Sialkot and 152 patients with De Querven’s disease during January 2018 to January 2019 are included in this study.

1 ml Methylprednisolone acetate with 2 ml of Xylocaine in first dorsal compartment.

We used Finkelstein test to examine the patients and record the severity of tenderness of first dorsal compartment however pain was rated using the VAS (Visual analogue Scale) before and post treatment. Our team took follow-ups and clinically assessed patients for 30 days on fortnightly basis and recorded the outcomes post treatment and collected the data and outcomes were statistically analyzed using SPSS Version 20.

Exclusion Criteria:
- Patients who denied steroid injection for long term treatment
- Patients suffering from rheumatoid arthritis
- Patients suffering from malunion due to a previous distal radius fracture

Inclusion Criteria: All the patients of De Quervain’s disease were included in this study who were ready to take steroid injection for long term procedure.

Procedure: The area is prepared with alcohol swab. 1 ml (40mg) of methylprednisolone acetate and 2 ml of Xylocaine is mixed in 5cc syringe. Then needle of the syringe is removed and 3cc syringe needle is applied. The mix injected in first dorsal compartment of affected wrist. The needle is pointing to the styloid radially and vertically to the abductor polices longus and extensor polices brevis tendons. We noted the synovial sheath by observing the changes in volume. We also gave paracetamol for pains relief to patients.

RESULTS

One hundred and Fifty-two (152) patients comprising 60 males (33% of total patients) and 92 females (67% of total patients) were listed in the study with a male to female ratio of 1:1.5. The Mean age group recorded was 36.80 ± 4.462 years where the maximum age documented was 47yrs and minimum was 30 year old; with most women being recent mothers. (Table-1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total Population n=152</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age ± SD</td>
<td>36.8 ± 4.462</td>
</tr>
<tr>
<td>Maximum</td>
<td>47</td>
</tr>
<tr>
<td>Minimum</td>
<td>30</td>
</tr>
<tr>
<td>Male to Female</td>
<td>33% : 67%</td>
</tr>
</tbody>
</table>

We recorded 44% Females with right hand pain and 16% with left while all males i.e. 39% had pain in their left side wrist. (Figure-1) Overall we recorded mean time of 28 days in analyzing clinical symptoms of all patients.

![Figure No.1: De-Quervain’s Patients affected Sides](image1)

![Figure No.2: Outcomes on VAS Scale before and post-treatment (mm)](image2)

![Figure No.3: Success Rate Gender wise post treatment](image3)
After the treatment of patients with methylprednisolone acetate injection we recorded an average decline in VAS score in females from 93.45 to 6.38mm and 95.28 to 6.37mm after final two follow-ups fortnightly and at month-end. (Figure-2)

After treatment an overall average success rate of 89% is noted with 85% in Females due to some complications occurring post pregnancy while 93% were recorded in males with a negative Finkelstein test subsequent to injection. (Figure-3)

Usually corticosteroid injection have side effects and in our research data only 4 patients had incidences of skin depigmentation on the site of the injection while others just felt pain which transit away in a day.14

**CONCLUSION**

Thus we conclude that corticosteroid injection are harmless and proves an operative treatment in management of De Quervain’s disease of wrist and showed notable improvement in patients.

**REFERENCES**


**DISCUSSION**

In order to treat the De Quervain’s disease, corticosteroid injections have become a standard procedure and is vastly used by physicians however other traditional methods to treat include non-steroidal anti-inflammatory medicines and surgeries. De Quervain’s divided between 0.5% of men in offices and 1.3% of women. Also it’s spread in pregnant or recent mothers and even post-menopausal women also suffer from it. In our study the mean age group recorded was 36.80 ± 4.462 years with 67% females and in a similar study 70% were female with mean age of 36.6 years. Mehinasab, Alemohammad in their work showed 86.3% female patients, with mean age of all patients 32.6 years. In our study we used 1 ml Methylprednisolone acetate with 2 ml of Xylocain in front dorsal compartment while other reported studies used slightly different quantities and concentrations like 0.25 ml of 40 mg/ml (10mg) Methylprednisolone and two other works show used similar concentration as our study. In our study an overall average success rate of 89% is noted with 85% in Females while 93% were recorded in males while Hadianfard et al showed improvement in almost 80% patients while Madani-kivi et al showed 93% success rates.

**Figure No.4: Patients with complications**

Amongst all only 4 patients had incidences of skin depigmentation on the site of the injection and 8 patients required second injection while 2 patients needed surgery. Almost all patients shared similar side effect i.e. pain on injection point which disappeared after a day.

**Author's Contribution:**

Concept & Design of Study: Muhammad Asif
Drafting: Muhammad Arif, Muhammad Omer, Farooq Tanveer
Data Analysis: Tanveer Haider, Rizwan Anwar, Mohammad Abdul Hanan
Revisiting Critically: Muhammad Arif, Muhammad Asif
Final Approval of version: Muhammad Arif

**Conflict of Interest:** The study has no conflict of interest to declare by any author.
Immunomodulatory Effects of Aloe Vera on Skin of BCG Vaccinated Albino Rats
Huma Riaz¹, Aisha Akbar², Maria Ilyas¹ and Mariam Saad³

ABSTRACT

Objective: To determine the immunomodulatory and anti-inflammatory effects of Aloe Vera gel by observing the changes in scar of Mantoux reaction on rat skin.

Study Design: Randomized Control Trial Study

Place and Duration of Study: This study was conducted at the Anatomy Department of PGMI, Lahore in March 2016 till February 2017.

Materials and Methods: The randomized experiment was performed on 24 albino rats (divided in 4 groups) of either sex. Group A was control. Group B, C and D were vaccinated by BCG intra dermally on day one. Group B was on placebo for thirty days. Group C and Group D were on different doses of Aloe Vera (For comparative study) orally by 5 cc disposable syringe for thirty days. On 30th day, Mantoux injection was given to Group B, C and D. After 72 hours the Mantoux injection site was observed grossly. Rats were sacrificed and specimen of skin were taken from that injection site, fixed and stained with H&E for microscopic analysis to observe the inflammatory and immune response.

Results: Statistically significant decrease in scar size of Mantoux reaction was observed in experimental groups (C and D) given variable doses of Aloe Vera (p<0.001) as compared to the group B. Leukocyte infiltration in Aloe Vera administered groups increased significantly (p=0.047) as compared to group B showing their role in anti-inflammatory response.

Conclusion: The results proved that Aloe Vera reduces the inflammation and promote the growth of collagen fibers when orally taken.

Key Words: Aloe Vera, Inflammatory reaction, Immune response.


INTRODUCTION

Aloe Vera is a succulent plant with fleshy leaves belongs to a family called Aloaceae. It has more than 400 species but only two species Aloe barbedensis Miller and Aloe aborascens are used for trade in the world.¹ It has polysaccharide that has potential to have effects on innate immune system. The carbohydrate derived polysaccharide has immune mediator capacity.² Aloe Vera traditionally used to cure skin cancer, arthritis, eczema, psoriasis, minor burns and digestive problems.³ It has a mannan protein containing several amino acids called wound healing hormones.⁴

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

Gel part of the leaf contain an acemannan a large polysaccharide have anti-inflammatory, immunomodulatory and antioxidant properties. Immune modulators means that these macro molecules have the ability to slowdown or speed up the immune system response thus protecting the body against itself.⁵ BCG is an attenuated vaccine recommended in healthy babies as close to the time of birth as possible with dose 0.1mg/ml percutaneous in upper part of right arm to enhance the immunity against tuberculosis.⁶ BCG induces CD4+ and CD8+ T lymphocytes that have cytotoxic potential in rats when given intradermal.⁷ Mantoux test is tuberculin sensitivity test and is screening tool for tuberculosis. A standard dose of 5 tuberculin units (TU) 0.1ml is injected intradermal and read 48 to 72 hours later.⁸ The reaction to intracutaneous injected tuberculin is the classic example of delayed (cellular) hypersensitivity reaction. T-Lymphocytes sensitized by prior infection are recruited to the skin where they release lymphokines.⁹ These lymphokines induce in duration through local vasodilitation, edema, fibrin deposition and recruitment of other inflammatory cells to the area. The reaction after Mantoux test is the response of the area of skin through inflammatory phase, fibroblastic phase and remodeling phase.¹⁰ Aloe Vera gel was extracted with the help of department of PCSIR and dose of 300 mg/kg was calculated.¹¹
MATERIALS AND METHODS

A total of 24 albino rats of average weight 100-150 grams were obtained from animal house of Post Graduate Medical Institute Lahore. This animal house had a setup according to international standards for breeding and housing of experimental animals. After acclimatization divided into four groups randomly. Group A was control. Group B was vaccinated with BCG. Group C and Group D were after BCG vaccination given doses of Aloe Vera 300 mg and 600 mg respectively by disposable syringe orally daily for one month. After 30 days Groups B, C and D were given Mantoux test percutaneous at abdominal region. After 72 hours the reaction site is observed grossly and then skin specimen were taken from the site for histological observations. For hematological parameters blood samples were taken from heart chambers of control and experimental animals group.

Analysis of Samples: Analysis of blood for hematological parameters were done from Indus lab Shadman Lahore. (Lymphocyte count and Immunoglobulins IgG and IgM was analyzed. Histological slides were made by Pathology department of Lahore General Hospital Lahore. Micrometry and photography done on teaching microscope of Anatomy department of PGMI Lahore.

Data Analysis: Data was analyzed using SPSS 21.0 (Statistical Package for Social Sciences). Quantitative data like weight, inflammatory cell infiltration count, number of fibroblast and hematological parameters were described in form of Mean +/- SD. Analysis of variance was done with Kruskal Wallis H test for quantitative variable. Pair wise comparison was made by a post hoc Tukey’s test. The qualitative data such as vascular congestion and fibrosis was described in form of frequency and percentages. Chi square was applied to observe association between categorical variables within groups. A p-value <0.05 was considered as statistically significant.

RESULTS

The data was collected from 24 albino rats of either sex. The observations of all studies subjects were recorded on various parameters, after giving Aloe Vera for one month to experimental groups C and D. At the end of study Mantoux reaction size was 0.68 mm +0.12 in experimental group C treated with Aloe Vera 300mg/kg and 0.69 mm +0.15 in group D with Aloe Vera 600 mg / kg for one month orally. While in group B (without Aloe Vera) area of inflammation was found bigger i.e. 0.89mm +0.13. Significant p-value of 0.001 was found when ANOVA was applied. For comparative study post hoc Tuckey test was used. The mean leukocyte infiltration in all groups was observed. Data was not normally distributed as assessed by Shapiro-Wilk test. Kruskal Wallis test was applied to compare the leukocyte infiltration among groups. It was found that the mean leukocyte infiltration count were significantly different. p-Value=0.0047 Group C with Aloe Vera dose 300 mg/kg was found to have leukocyte/white blood cells 5.2mm per square per field. Group D with Aloe Vera dose 600mg/kg also gave the similar result i.e. increase number of leucocyte with value of 4.5 mm per square per field. Group B without Aloe Vera gave the value of 3.0 mm per square per field. This anti-inflammatory action is due to decreased prostaglandin E2 synthesis from arachidonic acid by inhibition of cyclooxygenase pathway.5

Table No.1: Comparison of size of Mantoux reaction among groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (Control)</th>
<th>Group B (Only PCG Vaccination)</th>
<th>Group C (Aloe Vera 300 mg/kg)</th>
<th>Group D (Aloe Vera 600 mg/kg)</th>
<th>P Value#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of Mantoux Reaction</td>
<td>0.00±0.00</td>
<td>0.98±0.13</td>
<td>0.77±0.12</td>
<td>0.78±0.15</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*p value is significant = 0.001

Table No.2: Comparison of Leucocyte Infiltration among groups.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (Control)</th>
<th>Group B (Only PCG Vaccination)</th>
<th>Group C (Aloe Vera 300 mg/kg)</th>
<th>Group D (Aloe Vera 600 mg/kg)</th>
<th>P Value#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leucocyte Infiltration count (mm2 per field)</td>
<td>4.5±0.5</td>
<td>3.0±1.1</td>
<td>5.2±1.3</td>
<td>4.5±2.3</td>
<td>&lt;0.047</td>
</tr>
</tbody>
</table>

*p value is significant = 0.047

Table No.3: Comparison of Neutrophil Count among groups.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (Control)</th>
<th>Group B (Only PCG Vaccination)</th>
<th>Group C (Aloe Vera 300 mg/kg)</th>
<th>Group D (Aloe Vera 600 mg/kg)</th>
<th>P Value#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutrophil Count</td>
<td>1.0±0.6</td>
<td>1.2±0.4</td>
<td>1.5±0.5</td>
<td>2.0±0.0</td>
<td>&lt;0.13*</td>
</tr>
</tbody>
</table>

P-value:0.013
Table No.4: Comparison of number of fibroblasts among groups.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (Control)</th>
<th>Group B (Only PCG Vaccination)</th>
<th>Group C (Aloe Vera 300 mg/kg)</th>
<th>Group D (Aloe Vera 600 mg/kg)</th>
<th>P Value#</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of fibroblasts (mm² per field)</td>
<td>1.8±0.4</td>
<td>3.3±0.8</td>
<td>4.8±1.0</td>
<td>5.2±1.2</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

As p-value: 0.001 for number of fibroblast was found highly significant in groups C and D with Aloe Vera.

Hematological Parameters

Table No.5: Comparison of IgG level among groups.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (Control)</th>
<th>Group B (Only PCG Vaccination)</th>
<th>Group C (Aloe Vera 300 mg/kg)</th>
<th>Group D (Aloe Vera 600 mg/kg)</th>
<th>P Value#</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgG level</td>
<td>4196.7±81.6</td>
<td>4306.8±64.3</td>
<td>4373.5±57.1</td>
<td>3895.5±59.0</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Graph No.1: Comparison of size of Mantoux reaction among groups.

Graph No.2: Bar chart showing comparison of leucocyte infiltration among groups.

There was significant difference among experimental group B and C. There was no remarkable difference was found in group C & D.

Graph No.3: Bar chart showing comparison of Neutrophil count among groups.

Graph No.4: Bar chart showing comparison of number of fibroblasts among groups.

As p-value: 0.001 for number of fibroblast was found highly significant in groups C and D with Aloe Vera.
In our study albino rats were used as experimental animal model. As their resemblance with human characteristics, availability and low price. Animal models have been the holy grail of vaccine research for many years. Aloe Vera, a traditional herb and a succulent plant has been used for centuries for treatment of wounds and minor burns. Aloe Vera industry is gaining lots of attention as latest research proved lots of benefits of this magical herb. Aloe Vera contains 75 potentially active constituents, vitamins, enzymes, minerals, sugar, lignin, saponin, salicylic acids and amino acid. Term immune modulation means increase or decrease responsiveness to immune system. Latest research on Aloe Vera demonstrated that immune stimulating effects are dependent on the activation of the innate immune cells like neutrophils, macrophages, lymphocytes and NK (Natural Killer) cells by production of tumor necrosis factors and leukotrienes. Herbs that contain ascorbic acid, poly phenols and tannis act as antioxidant. They act by scavenging of reactive oxygen and nitrogen free radicals. Most important constituent of this medicinal plant is carbohydrate containing polysaccharides like acemannan and glucomannan. Acemannan is sometimes referred to as the foundation of other gradients. These polysaccharides have property to activate various toll like receptors and involve several innate immune stimulator that result in ensuring the immune response. Aloeride in gel part of Aloe Vera act as an immunostimulant, either alone or in combination with other aloe components, may have significant potential for wound healing and immunotherapy. Many immune modulatory activities including stimulation of cytokine secretion, histamine release, immunoglobulin release, macrophage stimulation. This study is about anti-inflammatory action and immune response of Aloe Vera on skin of albino rats by giving them vaccination and after that applying injury to skin by giving Mantoux test which is delayed type IV sensitivity reaction. Acute wound healing take four stages, these are hemostasis, inflammation, proliferation and remodeling. There are thousands of articles on Aloe Vera published during last few decades that proved that it has positive role in inflammation. Inflammation depends on leukocyte infiltration and their role in infection and inflammation. High poly saccharides and anthroquinones present in Aloe Vera can act as pro-oxidant and pro-inflammatory product. Polysaccharides with high molecular weight were found to exhibit the most potent macrophage activity, due to increase cytokines production, nitric oxide (NO) release expression of surface markers and phagocytic activities. A study by Langmead in 2004 proved that Aloe Vera reduces the inflammatory response by its ingredient mannose-6-phosphate. Neutrophils adhere to endothelium of blood vessels and block the micro vessels and cause a local decrease in blood flow. Aloe Vera decreases the cell mediated immunity by decreasing the secretion of lymphokiences and reduce the levels of interleukins (IL-5 and IL-10). Aloe Vera mucilage includes some ingredients like vitamin C and vitamin E which play crucial role in inflammation and lowering the immune response. Aloe Vera can act as pro-oxidant and pro-inflammatory product. Polysaccharides with high molecular weight were found to exhibit the most potent macrophage activity, due to increase cytokines production, nitric oxide (NO) release expression of surface markers and phagocytic activities. Neutrophils adhere to endothelium of blood vessels and block the micro vessels and cause a local decrease in blood flow. Aloe Vera decreases the cell mediated immunity by decreasing the secretion of lymphokiences and reduce the levels of interleukins (IL-5 and IL-10). Aloe Vera mucilage includes some ingredients like vitamin C and vitamin E which play crucial role in acceleration of wound healing with production of collagen fibers. Lysle oxidase levels are associated with degree of cross linking of collagen fibers that are newly synthesized. A recent study of Aloe Vera used topically and orally in rats showed increased levels of this enzyme, along with increased levels of this enzyme, along with increased amount of collagen. Oral administration of Aloe Vera affected the composition of lymphocyte subsets and immunoglobulins positively. It stimulated both cellular and humoral immune responses after immunization. IgG levels was found increased in group C (Aloe Vera 300mg/kg) but decreased in group D (Aloe Vera 600mg/kg). These results indicates that higher doses of Aloe Vera extract deliver immunosuppressive effect as research by GhasemVahedi. The data of our study has revealed encouraging results when Aloe Vera taken orally which could help to evolve new strategy of treatment for reduction of inflammation and lowering the immune response. Aloe Vera is easily available in Pakistan and could be used to alleviate the symptoms of auto-immune diseases like rheumatoid arthritis, ankylosing spondylisis, systemic lupus erythematosus, vasculitis and many more.

CONCLUSION
Aloe vera decreases the inflammatory response as size of Mantoux test was reduced. Its role on fibroblast and collagen fiber formation proved the wound healing capacity of Aloe Vera.
Author’s Contribution:
Concept & Design of Study: Huma Riaz
Drafting: Aisha Akbar
Data Analysis: Maria Ilyas, Mariam Saad
Revisiting Critically: Huma Riaz, Aisha Akbar
Final Approval of version: Huma Riaz

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES
Impact of Nuchal Cord on Perinatal Outcome and Mode of Delivery
A Survey at Tertiary Care Hospital
Shereen Sukhan, Drakhshan Nauman, Nadia Saif, Faiza Saghir and Fareeha Farooq

ABSTRACT

Objective: To determine frequency of nuchal cord, its association with mode of delivery and perinatal outcome in newborns with nuchal cord.

Study Design: Descriptive case series study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynaecology, Unit-2, Sir Ganga Ram Hospital, Lahore from 30-04-2014 to 29-10-2014.

Materials and Methods: All 210 patients fulfilling the inclusion/exclusion criteria presenting to Obstetrics and Gynaecology, Unit-2, Sir Ganga Ram Hospital, and Lahore were included in the study after informed consent. After complete history and physical examination, Doppler USG was carried out in all patients to diagnose the presence or absence of nuchal cord. All the patients were given trial of labour with continuous electronic fetal heart rate monitoring. Mode of delivery was decided by the researcher and mode of delivery noted. Presence or absence of nuchal cord also noted at time of delivery. Demographic data and outcome in all patients was recorded on pre-designed questionnaire. Perinatal outcome assessed by noting APGAR score at 1 min and 5 min and neonatal NICU admission, in nuchal cord group. Data was analysed using SPSS version 16. P-value ≤ 0.05 was considered as significant.

Results: Total deliveries during study period were 210. Total 34 patients were diagnosed of having cord around neck so calculated incidence of cord around neck in our study is 16.2%. Mean age of the patients was 27.04±2.5 years. Mean gestational age was 38.20±1.12. Out of 210 patients, 81 patients (38.6%) were primigravida while 129 patients (61.4%) were multigravida. Nuchal cord was present in 34 cases (16.2%). Out of these 34 cases of nuchal cord, 24 cases of loose nuchal cord and 10 cases of tight nuchal cords were observed. Caesarean section was carried out in 29 patients. 7 caesarean sections done in patients with nuchal cord and 22 sections done in patients without nuchal cord. Vaginal delivery was done in 181 (86%) patients including 2 vacuum deliveries. Out of 34 patients with nuchal cord, vaginal delivery was achieved in 27 (80%) patients and caesarean section was done in 7 cases (20%). This showed p-value of 0.210 (non significant).

Conclusion: This study suggests that nuchal cords occur commonly, loose or tight nuchal cords is not associated with increased chances of caesarean section and adverse perinatal outcome. Doing elective caesarean section in such cases only increases maternal morbidity without significant difference in neonatal outcome.

Key Words: Perinatal outcome, Nuchal cord, Caesarean section, APGAR score


INTRODUCTION

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

Nuchal cord is defined as loop of umbilical cord 360 degree around the fetal neck. It is most frequent cord accident. The prevalence of nuchal cord increases with advanced gestation. It is noted that overall prevalence is 5.8% at 20 weeks and 29% at 42 weeks of gestation. The prevalence at delivery varies from 28.2%-33.7%. Colour Doppler Ultrasound can detect cord around neck with > 90% sensitivity.

There are two types of nuchal cord. Type A is freely sliding pattern which can undo itself (loose variety). Type B is nuchal cord that encircles the fetal neck in a locked pattern and cannot undo itself (Tight variety). Problems and abnormality of the nuchal cord play a significant role in perinatal morbidity and mortality.
significant relation between nuchal cord and caesarean section or poor perinatal outcome. However most stillbirth babies have demonstrated umbilical cord complication. Multiple loops of umbilical cord increase the chances of intrauterine complications and low APGAR score.

The exact perinatal effects of presence of nuchal cord are still under debate. The relationship of nuchal cord with induction and augmentation of labour, prolong 2nd stage of labour and abnormalities in fetal heart has been demonstrated.

Nuchal cord is associated with fetal heart rate abnormalities during labour, owing to the pressure on cord. This leads to fetal distress and increased incidence of operative vaginal delivery and caesarean sections. Only few local studies on impact of umbilical cord on mode of delivery and poor perinatal outcome have been done. So this study was done in tertiary care hospital of Pakistan to demonstrate the frequency of nuchal cord in term pregnancies and its impact on mode of delivery and perinatal outcome.

MATERIALS AND METHODS

Descriptive case series conducted at the Department of Obstetrics and Gynaecology, Unit-2, Sir Ganga Ram Hospital, Lahore over a period of six months from 30-04-2014 to 29-10-2014. The calculated sample size was 210 cases

Sampling Technique: Non-probability, purposive sampling.

Inclusion Criteria
- Reproductive age group 22 to 35 years.
- Singleton pregnancy (diagnosed on USG)
- Gestational age > 36 weeks (on dating scan)
- Any parity
- All previous vaginal deliveries

Exclusion Criteria
- Patients with history of antepartum haemorrhage
- Previous history of caesarean section
- Breech presentation (on USG)
- Pre-eclampsia (blood pressure > 140/90 with proteinuria) and eclampsia (pre eclampsia associated with generalized tonic colonic fits).
- Placenta praevia (on USG)
- Transvers lie (on USG)

Data collection procedure:
All 210 patients fulfilling the inclusion/exclusion criteria presenting to Obstetrics and Gynaecology, Unit-2, Sir Ganga Ram Hospital, and Lahore were included in the study after informed consent. After complete history and physical examination, Doppler USG was carried out in all patients to diagnose the presence or absence of nuchal cord. All the patients were given trial of labour with continuous electronic fetal heart rate monitoring. Mode of delivery was decided by the researcher and frequency of caesarean section due to fetal distress was estimated. Presence or absence of nuchal cord also noted at time of delivery. Demographic data and outcome in all patients was recorded on pre-designed questionnaire. Perinatal outcome assessed by noting APGAR score at 1 min and 5 min and neonatal NICU admission, in nuchal cord group.

Data analysis procedure:
The collected data was entered and analyzed in computer software SPSS software (version 16.0). Mean and standard deviation was calculated for age and gestational age. Frequencies of type of nuchal cord and its relation with mode of delivery noted. Chi square was used to compare caesarean section with or without nuchal cord. P value less than or equal to 0.05 was considered significant. Data was stratified for parity and type of nuchal cord to see the effect of these variables on the outcome. Chi square test was used post-stratification with p value ≤ 0.05 considered as significant. APGAR score of neonates of all patients with nuchal cord noted at 1 min and 5 mins and neonatal admission in NICU also noted.

RESULTS

A total of 210 patients were included in this study during the study period of six months from 30-04-2014 to 29-10-2014. Regarding age distribution of patients, 180 (85.7%) were in the age range of 22-30 years and 30 patients (14.3%) were in the age range of 31-35 years. Mean age of the patients was 27.04±2.5 years. Mean gestational age was 38.20±1.12.

Out of 210 patients, 81 patients (38.6%) were primigravida while 129 patients (61.4%) were multigravida.9 (4.3%) primigravidas and 20 (9.5%) multigravidas were delivered by LSCS.72(34.2%) primigravida and 109(52%) multigravidas were delivered normally. Nuchal cord was present in total 34 cases (16.2%). Out of these 34 cases of nuchal cord, 24 cases of loose nuchal cord and 10 cases of tight nuchal cords were observed. Caesarean sections were carried out in 29 patients (13.8%). Out of these,7(20%) patients with nuchal cord landed into caesarean section.181(86%) patients were delivered vaginally including 2 vacuum delivery. Out of 34 patients with nuchal cord, vaginal delivery was achieved in 27 (80%) patients and caesarean section was done in 7 cases (20%). This showed p-value of 0.210 (non significant) (Table 1)

Stratification with regard to parity and type of nuchal cord is presented in tables 2 and 3, which again showed non significant results.

APGAR score of 34 babies born with nuchal cord was noted at 1 min and 5 mins (Table 4). 10 neonates where having APGAR score of less than 7 at 1 min. 4 neonates were having APGAR score less than 7 at 5 mins and needed admission in NICU. These 4 neonates were having meconium stained amniotic fluid in addition to
nuchal cord. Remaining 176 patients had neonates with good APGAR score.2 neonates in each LSCS and vaginal delivery group had APGAR score < 7 at 5 mins and were admitted in NICU. Likely no perinatal mortality noted.

**Table No.1: Mode of Delivery in relation with Cord around Neck (n=210)**

<table>
<thead>
<tr>
<th>Mode of Delivery</th>
<th>With CAN (n=34)</th>
<th>Without CAN (n=176)</th>
<th>Total (n=210)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSCS</td>
<td>N</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Vaginal Delivery (including vacuum delivery)</td>
<td>27</td>
<td>79.5%</td>
<td>154</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>100%</td>
<td>176</td>
</tr>
</tbody>
</table>

P-value = 0.210

**Table No.2: Stratification of Patients with regard to parity (n=210)**

<table>
<thead>
<tr>
<th>Parity</th>
<th>Caesarean section</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Primigravida</td>
<td>09</td>
<td>72</td>
</tr>
<tr>
<td>Multigravida</td>
<td>20</td>
<td>109</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>181</td>
</tr>
</tbody>
</table>

Chi Square = 0.81
P value = 0.369

**Table No.3: Stratification of patients with regard to type of nuchal cord (n=34)**

<table>
<thead>
<tr>
<th>Nuchal cord type</th>
<th>Caesarean section</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Loose</td>
<td>05</td>
<td>19</td>
</tr>
<tr>
<td>Tight</td>
<td>02</td>
<td>08</td>
</tr>
<tr>
<td>Total</td>
<td>07</td>
<td>27</td>
</tr>
</tbody>
</table>

Chi Square = 0.00
P value = 0.956

**Table No.4: Relation of neonatal APGAR SCORE with CAN (n=34)**

<table>
<thead>
<tr>
<th>APGAR SCORE</th>
<th>At 1 Min</th>
<th>At 5 Min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal Delivery (n=27)</td>
<td>LSCS (n=7)</td>
</tr>
<tr>
<td>0-4</td>
<td>2 (5.8%)</td>
<td>1 (2.9%)</td>
</tr>
<tr>
<td>5-6</td>
<td>5(14.7%)</td>
<td>3 (8.8%)</td>
</tr>
<tr>
<td>7-10</td>
<td>20 (58.8%)</td>
<td>3 (8.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>34</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Cord around neck is well known problem encountered in term pregnancies and is notorious for fetal distress in labour, increased chances of caesarean sections and poor perinatal outcome. It is also a common reason of agony in pregnant women who come to know about cord around neck by ultrasonography. Many women opt for elective caesarean delivery to minimize risk of poor perinatal outcome.

Cord around neck is identified in 25% neoborns, and one loop of cord is present in 20-33% of term pregnancies. In my study, prevalence of nuchal cord is 16% (34 cases out of total 210 cases). Many local studies support this finding. Nasreen A showed 14.85% prevalence of nuchal cord. Contrasting result shown by Zulfiqar S who showed that frequency of tight nuchal cord was 32%. An Indian study quoted 26.15% incidence of nuchal cord. However another study documented low prevalence of nuchal cord (2.1%).

In our study, there is no significant correlation between nuchal cord and maternal age and parity. A local study also documented no association between nuchal cord and maternal age. Similarly other studies also showed no impact of nuchal cord on duration of pregnancy.

Our study showed that rate of Caesarean sections with nuchal cord was 20% (7 out of 34) and vaginal delivery in 80% cases (27 out of 34). This finding confirmed by local study where incidence of caesarean section with nuchal cord was 26.7%. Dhar et al. also concluded that incidence of caesarean section with tight nuchal cord was 27.2%. Contrasting result was shown by another study where incidence of caesarean section with tight nuchal cord was 7.82%. Another local study showed 66.7% cases of vaginal deliveries with nuchal cord.

A study by Nasreen A, showed that 50% cases with nuchal cord were delivered vaginally and 36% cases were delivered by caesarean section. Comparison of these results showed that nuchal cord did not increase incidence of caesarean section.

The impact of nuchal cord on perinatal outcomes had been studied both locally and internationally. Many studies pointed out no unfavourable perinatal outcomes with nuchal cord and many controversies exist on association of nuchal cord and perinatal outcome. Only 4 neonates out of 34 (11.7%) had APGAR score less than 7 at 5 mins and needed NICU admission. These neonates were also having meconium stained liquor. This outcome was also confirmed by a local study where only 3 neonates with nuchal cord had APGAR score less than 7 at 5 mins. Another local study showed APGAR score of < 7 at 5 mins in 8.04% cases. Dhar et al. also showed that 5.20% neonates were having APGAR score of < 7 at 5 mins of life. A retrospective population based study also confirmed that there is no association of nuchal cord with adverse...
perinatal outcome.10 These findings also confirmed by two other studies.20,21

CONCLUSION
In conclusion, this study suggests that nuchal cords occur commonly, loose or tight nuchal cords may not be associated with increased chances of caesarean section and adverse perinatal outcome. Doing elective cesarean section in such cases only increases maternal morbidity without significant difference in neonatal outcome.

Author’s Contribution:
Concept & Design of Study: Shereen Sukhan
Drafting: Drakhshan Nauman
Data Analysis: Nadia Saif, Faiza Saghir, Fareeha Farooq
Revisiting Critically: Shereen Sukhan, Drakhshan Nauman
Final Approval of version: Shereen Sukhan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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11. Taizon S. Perinatal outcome in cases with or without nuchal cord. Ann King Edward Med Uni 2014; 20:159- 64.
Comparison of Efficacy and Safety of Nifedipine Versus Beta-Sympathomimetics for Suppression of Preterm Labour

Drakhshan Nauman1, Nadia Saif2, Shereen Sukhan3, Faiza Saghir3, Fareeha Farooq3 and Maryam Rashid4

ABSTRACT

Objective: To compare the effectiveness and safety of Nifedipine with beta-sympathomimetics for suppression of preterm labour.

Study Design: Quasi-Experimental study.

Place and Duration of Study: This study was conducted at the Obstetrics and Gynaecology Department of Pakistan Ordinance Factories (POFs) Hospital, Wah Cantt from July, 2012 to June, 2013.

Materials and Methods: A total of 120 admitted pregnant women in preterm labour were studied. Patients were divided into two groups of 60 each. The patients presenting with regular painful uterine contractions at frequent intervals and with appreciable cervical change, at gestation > 24 weeks or < 37 weeks were admitted for tocolysis. Two groups were formed by using random numbers table. Group A was given Nifedipine and Group B was given Beta-sympathomimetic drug i.e. Terbutaline. All relevant information was written on proforma.

Results: During study period, 120 patients were enrolled. 60 patients were randomized to Nifedipine and 60 to Beta sympathomimetics treatment. The age distribution, gravidity and gestational age were same in both groups. Tocolysis was successful in 93% of patients in Nifedipine group and 67% of patients in Beta sympathomimetics group. It failed in 7% and 33% in Nifedipine and Beta sympathomimetics groups respectively. The mean gestational age achieved at delivery was 32.67 ± 2.248 and 32.43 ± 2.473 in Nifedipine group and Beta sympathomimetics group respectively. Nifedipine caused effective tocolysis in 83% patients within 24 hours whereas Beta sympathomimetics caused it in only 56% patients within 24 hours. Hypotension was the commonest side effect seen in 17% of patients in Nifedipine group and 43% in Beta sympathomimetics group. Tachycardia was observed in 70% of the patients and vomiting was observed in 12% of patients in Beta sympathomimetics group.

Conclusion: Nifedipine is more efficacious and safe as compared to Beta sympathomimetics in suppression of preterm labour with lesser side effects.


INTRODUCTION

Preterm labour is defined as onset of labour after 24 weeks and before 37 completed weeks of gestation.1

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About 13 million preterm births occur worldwide annually.2 The incidence of preterm labour ranges from 5% in developed countries to 25% in developing countries.3 It is considered one of the major causes of perinatal morbidity and mortality and 70-80% of perinatal deaths are due to preterm labour.4,5 The perinatal mortality falls with advancing gestational age from being 66% at 28-31 weeks, 38% at 32-33 weeks to 20% at 34-36 weeks.6 Causes of preterm labour include smoking, previous or family history of preterm birth, psychological stress, multiple pregnancy, anemia, polyhydramnios, antepartum haemorrhage, uterine and fetal anomalies, trauma, medical disorders, systemic, vaginal and urinary tract infections, cervical incompetence, premature rupture of membranes.1,3,7,8 Regular uterine contractions at frequent intervals and documented cervical change or appreciable cervical dilatation or effacement are diagnostic.9 Management includes bed rest, hydration, sedation, corticosteroid therapy, tocolysis, rescue cerclage and antibiotics.8,10
Tocolytics are the drugs used to suppress uterine contractions.11 Aim is to enable transfer of mother to tertiary care centre and to prolong pregnancy sufficiently so that corticosteroids can be given to enhance fetal lung maturity.12 No studies have shown that tocolysis can improve fetal outcome.13 A variety of tocolytic drugs are available including beta sympathomimetics (salbutamol, terbutaline, ritodrine), prostaglandin synthesis inhibitors, magnesium sulphate, progestins, cyclooxygenase inhibitors, calcium channel blockers (nifedipine), nitric oxide donors (glyceryl nitrates) and oxytocin receptor antagonists (atosiban).7,14

Beta-sympathomimetics, a phenylethylamine derivative, which was introduced in 1971 for obstetric use and was approved by FDA for tocolysis.14 It relaxes uterus and uterine vessels.9 These can be given orally or parenterally. Maternal risks include palpitations, tremors, nausea, headache, tachycardia, hypotension, chest pain, hyperglycemia, hypokalemia and pulmonary oedema.7,9,14 Fetal risks include tachycardia, hypoglycemia, ileus and intraventricular hemorrhage.7,8,14 Contraindications include cardiac disease, hyperthyroidism, uncontrolled hypertension or diabetes, asthma, and chronic hepatic or renal diseases.9 Nifedipine is calcium channel blocker and inhibits influx of calcium into myometrial and other cells and reduces muscle contraction.9 It can be given by mouth or sublingually. Various forms include immediate-release capsules of 10 mg and extended-release tablets of 20, 30, 60 and 90 mg.14 Maternal risks include hypotension, tachycardia, headache, flushing and vomiting.9,14 Fetal risks include tachycardia and hypotension.10 Caution should be taken when the maternal cardiovascular condition is compromised, such as with intrauterine infection, twin pregnancy, maternal hypertension, cardiac disease, hyperthyroidism.14

MATERIALS AND METHODS

The Quasi-experimental study was carried out in Obstetrics and Gynaecology Department of Pakistan Ordinance Factories (POFs) Hospital, Wah Cantt from July 2012 to June 2013.

Data Collection:

After history, examination and investigations two groups were formed by using random numbers table. Group A was given Nifedipine 20 mg (Adalat retard) stat by mouth then 10mg every 6 hours until the patient was well tocolyzed. Group B was given beta-sympathomimetic drug i.e. Terbutaline (Bricanyl) by intravenous infusion containing 5 ampules of Terbutaline (0.5mg/1ml ampule) in 500ml of normal saline solution initially at the rate of 8-10 drops per minute. The dose was titrated with reference to suppression of contractions, increase in pulse rate and change in blood pressure. A maternal heart rate of more than 135 beats /min was avoided. The patients were tocolyzed by one of these drugs for maximum period of 48 hours. Fetal heart was monitored half hourly. Monitoring of pulse rate, blood pressure and uterine contractions were done initially hourly for 4-6hrs then 4 hourly. If uterine contractions persisted then vaginal examination was repeated after 2 hours. Duration of tocolysis was also noted. Side effects like nausea or vomiting, tachycardia and hypotension were observed.

Inclusion Criteria: The patients presenting with regular uterine contractions at frequent intervals and or with appreciable cervical change, at gestation ≥24 weeks or < 37 weeks were admitted for tocolysis and included in study.

The exclusion criteria: Patients with cardiovascular disease, cervical incompetence, intrauterine infections, twin pregnancy, maternal hypertension or severe pre-eclampsia, placental abruption, diabetes mellitus and hyperthyroidism were excluded from study.

Data Analysis: All data was analyzed on SPSS version 10. Side-effects i.e. vomiting, tachycardia and hypotension were presented by frequencies. Mean ± S.D. were calculated for age of patient and duration of tocolysis. For comparison of qualitative variables (vomiting, tachycardia and hypotension) chi-square test was applied. P <0.05 was taken as statistically significant.

RESULTS

During the study period 120 patients were enrolled in the study; 60 were allocated to Nifedipine (Group A) and 60 received Terbutaline (Beta sympathomimetic - Group B).

The age distribution among the two groups was found to be similar. In both the groups most of the patients i.e. 28 (47%) were in the age group 25-30 years. Nifedipine group (Group A) included 20 (33%) patients whereas Beta sympathomimetics group (Group B) included 24 (40%) patients in the age group between 20-25 years. The mean age of the patients was 27.40 ± 4.49 years in Nifedipine group and 27.40 ± 4.09 years in Beta sympathomimetics group with p value of 1.000.

(Table 1)

| Table No.1: Comparison of demographic profiles of patients in two groups: |
|-----------------|-----------------|-----------------|-----------------|
| Parameter       | Nifedipine (mean ± std) (n=60) | Beta Sympathomimetics (mean ± std) (n=60) | P-Value |
| Age (years)     | 27.40 ± 4.492   | 27.40 ± 4.098   | 1.000 |
| Gestational age (weeks) | 32.67 ± 2.248 | 32.43 ± 2.473 | 0.704 |
| Gravidity       | 2.56 ± 1.165   | 2.80 ± 1.672   | 0.593 |
The gestational age between the two groups was also taken into consideration. In Nifedipine group 18 (30%) patients were < 32 weeks of gestation whereas in Beta sympathomimetics group 16 (27%) patients were of same gestational age. In Nifedipine group 28 (47%) patients were between 32-34 weeks and in Beta sympathomimetics group 32 (53%) were of same gestational age. In Nifedipine group 14 (23%) patients were > 34 weeks of gestational age whereas 12 (20%) in Beta sympathomimetics group were of same gestational age. The mean Gestational age of the patients who presented with preterm labour was 32.67 ± 2.248 years in Nifedipine group and 32.43 ± 2.473 years in Beta sympathomimetics group with p value of 0.704. The mean gravidity of the patients who presented with preterm labour was 2.56 ± 1.165 in Nifedipine group and 2.80 ± 1.672 in Beta sympathomimetics group with p value of 0.593. (Table 1)

Effectiveness of tocolysis was studied in these groups. Tocolysis was successful in 56 (93%) patients of Nifedipine group and 40 (67%) of Beta sympathomimetics group. It failed in 4 (7%) patients of Nifedipine group and 20 (33%) patients of Beta sympathomimetics group. The difference in response between the two treatment groups was statistically significant with P- value of 0.0098. (Table 2)

Table No.2: Comparison of Efficacy of Drugs in both groups

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Successful</th>
<th>Failed</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Nifedipine (n=60)</td>
<td>56</td>
<td>93</td>
<td>4</td>
</tr>
<tr>
<td>Beta-Sympathomimetics(n=60)</td>
<td>40</td>
<td>67</td>
<td>20</td>
</tr>
</tbody>
</table>

In Nifedipine group tocolysis was achieved successfully within 12 hours of administration of drug in 22 (36%) patients and 02 (03%) patient of Beta sympathomimetics group. Tocolysis was established between 13-24 hours in 30 (50%) patients in Nifedipine group and 20 (33%) patients in Beta sympathomimetics group. Tocolysis was achieved between 25-36 hours in 02 (03%) patient in Nifedipine group and 06 (10%) patients in Beta Sympathomimetics group. Tocolysis was established in 37-48 hours in 02 (03%) patient in Nifedipine group and 12 (20%) patients in Beta sympathomimetics group. Tocolysis was unsuccessful in 4 (07%) patients in Nifedipine group and 20 (33%) patients in Beta sympathomimetics group. The mean duration of achievement of tocolysis was 13.67 ± 10.886 hours in Nifedipine group and 35.63 ± 13.319 hours in Beta sympathomimetics group with p value of 0.000. Very few side effects were seen in both groups, commonest being hypotension. It was seen in 10 (17%) patients in Nifedipine group and 26 (43%) patients in Beta sympathomimetics group with p value of 0.0798. Other side effects are shown in table 3.

Table No. 3: Comparison of complications of two groups:

<table>
<thead>
<tr>
<th>Side Effects</th>
<th>Nifedipine (n=60)</th>
<th>Beta Sympathomimetics (n=60)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes (n)</td>
<td>%</td>
<td>Yes (n)</td>
<td>%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>02</td>
<td>03</td>
<td>24</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>02</td>
<td>03</td>
<td>42</td>
</tr>
<tr>
<td>Hypotension</td>
<td>10</td>
<td>17</td>
<td>26</td>
</tr>
</tbody>
</table>

DISCUSSION

Preterm birth is the leading cause of neonatal mortality and the most common reason for antenatal hospitalization. Reduction in the rate of preterm birth can decrease neonatal morbidity and mortality and as obstetrician we need to find effective and safe method to prolong pregnancy. On reviewing the national as well as international literature many studies were found in which different tocolytic agents were compared with each other.

Nifedipine was introduced as a tocolytic agent at a time when beta-agonists and magnesium sulphate dominated the arena for the prevention of preterm birth. The oral route of administration, availability of immediate and slow-release preparations, low incidence of (mild) side effects and its limited costs explain the attraction to this medication from the obstetric field and its rapid and widespread distribution. However no study have shown that tocolysis can improve fetal outcome. In my study the two drugs Nifedipine and Beta sympathomimetics were compared with each other to find out a safe and effective tocolytic agent to reduce the neonatal morbidity and mortality.

The association of preterm birth with extremes of maternal age was not significant in my study as most of the patients (47% in Nifedipine and Beta sympathomimetics group) in our study were in the range of 26-30 years. This is comparable to study done in India in 2017 by Dr Burkhna Gujjar who compared Nifedipine, Ritrodine and Isoxsuprine as tocolytic agent and majority of cases were between 21-25 years of age. Similarly a study by Nadeem Shahzad also showed that 51.7 % patients in Nifedipine group and 43.3 % patients in terbutaline group were between 21-30 years of age. Mean age of patients who presented to preterm labour in our study was 27 years in both groups and this is comparable to other studies.

While comparing parity of patients in both groups, in my study, 60% patients in Nifedipine group and 53 % in Terbutaline group were G2-G3. This is comparable to study by Nadeem Shahzad. However contrasting
results are shown by Bai G D where 66.7 % patients in Nifedipine group and 56.7 % in Ritrodine group were primigravida. In our study, efficacy was defined as prolongation of pregnancy for ≥ 48 hours. It was achieved in 93 % of patients in Nifedipine group and 67 % patients in Terbutaline group and difference is statistically significant (p value 0.0098). A study in India also showed success rate of 80% and 68% in both groups. However contrasting results were shown in a study done by Kiren K. Malik in which tocolytic success rate was only 40% with Nifedipine and 30 % with beta agonist group.

Two systematic reviews compared efficacy of Nifedipine and Ritrodine. In one review 607 women and in other review 679 women were compared. In both reviews Nifedipine was more effective in prolonging pregnancy > 48 hours. A meta-analysis in 2002, reviewed 12 randomized-controlled studies involving 1029 women and found that Nifedipine is more effective than Ritrodine and is more safe. Because each individual trial has been small, this is the best evidence to date that nifedipine can be used for tocolysis. Cessation of treatment due to adverse reaction occurred in 1 of 419 patients, vs. 29 of 414 with other tocolytic. In our study no patient had such an adverse effect to stop the treatment. Van De MW, also compared both agents and concluded that Nifedipine is more effective. However, when they evaluated efficacy on basis of prolongation of labour and delaying fetal birth it showed that birth was delayed for an average 5.0 weeks with Nifedipine and 4.3 weeks with Ritrodine (p value 0.4).

Both tocolytic agents have fetomaternal side effects. Nifedipine has fewer side effects as compared to Terbutaline. In our study, while comparing maternal side effects, vomiting, tachycardia and hypotension was more profound with Terbutaline as compared to Nifedipine. Same results were shown by an Indian study in 2017 where none of the patient treated with Nifedipine had hypotension and fetal tachycardia and 10% patients in Ritrodine group had hypotension and fetal tachycardia. Overall side effects were 20% in nifedipine group and 28% in ritrodine group. A study conducted in 2011 also concluded that overall side effects were 30% (especially headache) in Nifedipine group and 80% (especially palpitations) in Salbutamol group. Similarly a study done in Jinnah hospital in 2007 showed that 6 % patients in Nifedipine group suffered from side effects as compared to 28% patients in Salbutamol group. These results are comparable to our study.

However a study published in European Journal in 2006 have contrasting results regarding efficacy among both groups. This study showed that Ritrodine had rapid onset of action and better efficacy in delaying preterm labour for initial 48 hours. However prolongation of pregnancy beyond one week was more effective with Nifedipine and Ritrodine also showed much less side effects as compared to Ritrodine.

CONCLUSION

On the basis of better efficacy and lesser complications with Nifedipine as compared to Beta sympathomimetics, it is concluded that Nifedipine can be used with more confidence and safety as compared to Beta sympathomimetics for tocolysis.

REFERENCES


The Outcomes of Liver Abscess, in A Tertiary Care Unit
Sajid Hussain¹, Junaid Cheema² and Fatima Zulfiqar²

ABSTRACT

Objective: To study aims at the early clinical presentation, diagnosis, management and to establish guidelines in view of conservative or either intervention.

Study Design: Longitudinal study

Place and Duration of Study: This study was conducted at the Surgical Department of Allama Iqbal Memorial Teaching Hospital Sialkot from Jan 2017 to Jan 2020.

Materials and Methods: A total of 200 patients visited the OPD; only 40 were willing to be hospitalized from Jan 2017 to Jan 2020. Patients more than 20 years. Suspicion of liver abscess on the basis of clinical and diagnostic confirmation.

Results: A total of 40 cases were studied, with the mean age of 44 years; all patients male and female studied for their presentations (pain, fever, vomiting, chills, jaundice, diarrhea, tenderness, enlarged liver, management conservatively or surgically. The collected data was analyzed through SPSS 20.

Conclusion: Males affected more than female, ultrasound is the best imaging technique and aspiration found to be best in interventional technique.

Key Words: Enlarged liver, conservative, aspiration, pig tail, mortality.


INTRODUCTION

Liver abscess had a long history since 3000 B.C, for which patients present with upper abdominal pain which is more marked in right hypochondrium. If these patients are not managed earlier they will have higher morbidity and mortality. The most of the abscesses were amoebic than pyogenic.

The pyogenic variety is more marked in the western countries as compared to developing countries, which are failed to be documented due to lack of insufficient resources.

The main reasons of pyogenic abscess are ascending biliary infection through portal venous system and septicemia as result of infections caused by E.Coli, klebsiella, streptococcal followed by staph and proteus. The investigations which are carried out are ultrasonography, by aspirating reddish brown paste like material.

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Received: February, 2020
Accepted: March, 2020
Printed: May, 2020

The diagnosis of amoebic liver abscess is made by the clinical picture, examination findings, ultrasound findings and management plans.

There were enough literature present internationally to talk about the involvement of the lobes right, left or both, liver enlargement, raised LFTs, type of liver abscess amoebic pyogenic, single or multiple and different management plans. Globally, which reveals that smaller abscesses may be treated conservatively while larger needs some modalities ranging from aspirations to pig tail catheter insertion but there is no definite consensus for the management of the symptomatic liver abscess but there was a very scarce literature available to be studied in order to bridge a existing gaps and comparing our data with established data in order to predict about the clinical picture, examination findings and diagnostic tools which are available and different treatment modalities in order to decrease morbidity and mortality of the patients. The idea of the minimal invasive procedures are still of the significant importance in the treatment modalities of liver abscess, in combination with modern antibiotics. Best treatment option is the percutaneous techniques.

Keeping all above mentioned facts in mind a study was carried out in 40 patients in our local context of a tertiary care unit draining more than four million populations.

The present study is to finding out some link between the clinical presentations, examination findings and treatment modalities and comparing their efficacy with already researched before.
MATERIALS AND METHODS

A total of 200 patients visited the OPD; only 40 were willing to be hospitalized from Jan 2017 to Jan 2020.

Inclusion criteria: Patients more than 20 years
Suspicion of liver abscess on the basis of clinical and diagnostic confirmation.

Exclusion criteria: Age less than 20 years and cases associated with malignancy, immune compromised, and ascetic with other effusions.

A thorough hospital based longitudinal study age,gender,pain,fever,chills,vomiting,jaundice,diarrhea, enlarged liver, tenderness, raised liver function tests, lobes involved, single or multiple, amoebic/pyogenic, conservative or intervention like aspiration, pigtail, both or any surgical intervention, morbidity/mortality.

RESULTS

The liver abscess was more common in male30 (75%) female 10 (25%), pain was marked in 32 patients(80%),fever in 27 patients(67.5%) chills in 30 (75%) vomiting 20 patients(50%)jaundice in 20 (50%), complaint of diarrhea in 21 patients (52.5%),enlarged liver in 21 (52.5%) tenderness in 17 patients (42.5%), LFTs raised in 18 patients(45%),involved right, left or both lobes as shown in table 1 which when further analyzed found to be significant (P value 0.01749)

Table No.3: Statistics analysis of lobes in respect to treatment

<table>
<thead>
<tr>
<th>Lobe involved</th>
<th>Treatment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conservative</td>
<td>Aspiration</td>
</tr>
<tr>
<td>Right Lobe</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>% within Lobe_involved</td>
<td>15.8%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Left Lobe</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>% within Lobe_involved</td>
<td>73.3%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Both</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>% within Lobe_involved</td>
<td>16.7%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>% within Lobe_involved</td>
<td>37.5%</td>
<td>30.0%</td>
</tr>
</tbody>
</table>

Table No.4: statistics analysis

<table>
<thead>
<tr>
<th>Chi-Square Tests</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>20.110*</td>
<td>6</td>
<td>.003</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>19.490</td>
<td>6</td>
<td>.003</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.061</td>
<td>1</td>
<td>.804</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

Our study included 40 patients show mean age group of presentation was 44.35 the minimum age was 22 years while maximum age was 65 years, there is a male preponderance in our case with a ratio of 3:1 as compared to other literature ratio ranging from 10:1 to 11.7:19, in another study carried out by the kapoor et al it was 5.66:110.

Incidence of pain was in 80% of cases which was consistent with the recent study where it was 88%111,which is quite high as compared to 75% in India the incidence of jaundice was also 50%while it was 31.5% in the study of see and Rockey11.

Most of the liver abscess was amoebic 60% while it was 67% Rajakn CLstudy12 while the incidence of amoebic liver abscess was more or less same 61.81% in a study carried

Out by sudhirjayakar13 while studies carried out in western countries the incidences of pyogenic abscesses were more than amoebic abscesses carried out by the Kaplan14. Liver enlargement is not necessarily associated with liver abscess as it was present only in
21 cases (52.5%) which is consistent with the studies carried out in 56 patients studied in san Francisco hospital between 1979 to 1994[15]. Similarly LFTs are raised in 18% of the cases(45%) while 22 patients did not had any elevations in the LFTs (55%) which was consistent with the studies carried out in 352 cases in univariate and multivariate analysis[16].

Right lobe involved in 47.5% while left lobe involved in 42.5% while in case of study by Rose it was 55% involving right lobe,27.7% in left lobe and 16% in both lobes.23,25 while in a prospective study in 45 patients 80% right lobe left lobe 18% while 2%[15], similarly liver abscess involved 57.5% as a single while 42.5 as multiple abscesses which was consistent with the study of Mathieu et al and other studies .our study was also consistent with the studies carried out by Greenstein et al[16].

Most of our patients responded to the conservative treatment with good control of antibiotics 37.5% patient improved after a conservative treatment, which was consistent and coherent with the studies carried out by Akgun et al[6] where metronidazole were given to single solitary liver abscess while PCD was carried out in 12 cases (30%) which is more successful in terms of recurrence of abscess, relief of symptoms and decrease in the size of cavity and took a short duration as compared to other modalities, Pig tail catheter was used in 10 cases (25%) while surgery was carried out in only three case where all modalities failed as a last resort. The management of the liver abscess is quite debatable and it varies center to center ,lot of comparative studies have been carried out in the past where pig tail was preferred over percutaneous aspirations[17] but in 306 patients success rate and clinical improvement was more in percutaneous aspiration as there is lot of reduction in size of the cavity, while a study on the 45 patients a comparative studies of needle and catherization showed the superiority of catheterization on pig tail, similarly few other studies showed the same results and inconsistent to our studies. Total 45 patients in which 22 patients were aspirated while 23 got pig tail catherization[18] while in another study in 98 patients 13 were managed conservatively, 79 were managed through PCD while in 6 patients, laparotomy was carried out[16].

Surgical interventions were carried out in just 3 cases which presented with peritonitis. No previous attempt of percutaneous, pig tail catherization was attempted, a lot of variation also exist in this aspect, where treatment of pyogenic abscess was compared with the percutaneous drainage in a study carried out by Bertel et al[13], another study the 48 patients study with pyogenic liver abscess out of which 35 patients needed surgical intervention with 91.5 % improved results with mortality rate of 8.5%[20]. Mortality and morbidity rates were also compared, the morbidity was decreased with early diagnosis and the earliest interventions which were carried out, in our study, mortality rate was quite low as because of early diagnosis and management, the morbidity was found in 11 cases while mortality rate was 3/40 (7.5%).Hospital stay was 13.6+_8.1 days and with antibiotic therapy 34.7+ 40.6 days which was carried out in a 67 patients study with 61 male and 6 female patients[21].

**CONCLUSION**

The study revealed most common affected age group was between third and fifth decade. Males are affected more than female, incidence of amoebic liver abscess was more as compared to pyogenic liver abscess, and few responded to medical treatment, majority required aspirations found to be better followed by pig tail catherization, surgery as interventions in liver abscesses management with less morbidity and quite rare mortality.

**Author’s Contribution:**

Concept & Design of Study: Sajid Hussain
Drafting: Fatima Zulfiqar
Data Analysis: Junaid Cheema
Revisiting Critically: Fatima Zulfiqar
Final Approval of version: Sajid Hussain

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**REFERENCES**


Comparison Between Topical and Intravenous Xylocaine on Pharyngo-Laryngeal Complications in Breast Surgery Patients
Muhammad Shazad¹ and Syed Muhammad Nadeem²

ABSTRACT

Objective: to compare the immediate pharyngo-laryngeal complications using topical and intravenous lignocaine in daycase breast surgery patients.

Study Design: Randomised control trial study.

Place and Duration of Study: This study was conducted at the Department of Anaesthesiology, ICU and Pain medicine, Liaquat National Hospital, Karachi during July 2009 and August 2010.

Materials and Methods: In this article, we included eighty six ASA I and II, elective breast surgery female patients. Patients were randomized into group I (intravenous lignocaine) and group T (topical lignocaine). Topical lignocaine was sprayed using tongue depressor over base of tongue and posterior pharynx area. After one minute of propofol induction, consultant anaesthetist inserted appropriate size deflated LMA. Conditions for LMA insertion i.e; gagging, coughing or laryngospasm were recorded. Acceptable conditions if no gagging, coughing or laryngospasm resulting in successful first-pass placement and ventilation recorded.

Results: Elective breast surgery patients were randomly assigned to two groups, group I (intravenous lignocaine) and group T (topical lignocaine). The mean age in group I was 30+/- 9 years and in group T it was 31+/- 10 years. There were 86 females of which 45 females in group I and 41 females in group T. LMA insertion was compared among 86 females who underwent breast surgeries. Immediate pharyngo-laryngeal complications were noted in 5 (11.1%) in group I patients while none in group T patients. In comparison between age less and more than 30 years patients, more complications in more than 30 years age group and more in I group patients 5 (24%) while only 1 (4%) in group T (p<0.04).

Conclusion: Topical 4% lignocaine application spray over base of tongue and posterior pharynx area reduces immediate pharyngo-laryngeal complications in day case female patients more effectively than 2% intravenous lignocaine without using any intravenous muscle relaxation agent. Improving patient comfort and readiness for early discharge in ambulatory surgeries may be attributed to this anaesthesia technique.

Key Words: LMA, gagging, coughing, laryngospasm


INTRODUCTION

Day case breast surgery patients present a unique challenge to the anaesthesiologists. Different strategies been employed to prevent complications and readiness to discharge within 23 hours.¹ Breast surgeries in the low income countries with limited resources pose a mounting task.

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

Total intravenous anaesthesia, paravertebral blocks, pectoral blocks all effective but resource intensive. Multiple different placement techniques been devised for range of laryngeal mask airways.² Decreasing the pharyngo-laryngeal complications by using variety of medications to improve upon airway instrumentations and recovery.³ Morbidity decreases during general anaesthesia with laryngeal mask airway placement in breast surgery female patients enabling readiness for early discharges.⁴ Airway morbidity using endotracheal intubation poses serious challenges to anaesthesiologists especially during ambulatory surgeries.⁵ Laryngeal mask airway as an alternative to endotracheal tube has revolutionized the field of Anaesthesia.⁶ The placement of laryngeal mask airway appears easy but complications free placement requires deep anaesthesia and attenuation of pharyngo-laryngeal reflexes. Multiple drug combinations been experimented for uneventful airway management. Increasing the dose of anaesthetics or opioids may result in adverse effects to the patients. Addition of muscle relaxants may delay the reversal...
process from anaesthesia and adverse respiratory complications. Even acupressure and acupuncture been advocated for adequate attenuation of airway reflexes. Godsend LL30 to Xylocaine (Acetanilide) or Lidocaine (m-xylidide) was discovered at the Institute of Chemistry at Stockholm university, Stockholm. First clinical trials of lidocaine was conducted by pioneer Swedish anaesthesiologist, Torsten Gordh. Different modes of administration of xylolcaine like intravenous, gel application, spray, nebulization, subarachnoid, epidural and nerve blocks have been used. Different concentrations and different doses of xylolcaine used to reduce pharyngo-laryngeal complications in different studies.

Therefore, we test the hypothesis that use of 4% topical lignocaine prior to propofol induction could reduce the immediate airway complications when compared with 2% intravenous lignocaine prior to propofol induction in breast surgery female patients during ambulatory surgeries.

**MATERIALS AND METHODS**

After approval from hospital ethics review committee, informed written consent was ensured from study participants. Randomization into equal groups was done using simple sealed envelope technique prior to study initiation and opened prior to anaesthesia by the investigator who will give topical or intravenous lignocaine. Exclusion of emergency cases, risk of gastric content aspiration, pregnant females, co-existing renal or liver disease, limited mouth opening, known allergy to study drugs, refusal to give consent were excluded.

In operating room, standard monitoring, including non invasive blood pressure, pulse oximeter and ECG placed on patients. A baseline heart rate and blood pressure were recorded. Group I received intravenous lignocaine 1.5 mg/kg followed by pre-oxygenation for three minutes. Group T received 5 ml of 4% lignocaine spray to the posterior pharynx and base of tongue area in sitting position after depressing the tongue with a tongue depressor. The patients were advised to gargle as tolerable and turned supine immediately followed by pre-oxygenation for 3 minutes. After 3 minutes pre-oxygenation in both groups, intravenous nalbuphine 150 mcg/kg followed by 2mg/kg propofol over 15 seconds were injected. The LMA was inserted 60 seconds after completion of propofol injection after loss of consciousness and eye lash reflex. In case, eye lash reflex was still intact further boluses of 0.5mg/kg propofol was used. Classic LMA was selected for patients according to their corresponding weights. All LMA insertions were done using method described by Dr. Archie Brain. Water based jelly will be applied on the posterior surface of the LMA and pressed along the hard plate using the index finger. It is finally pushed further down till resistance is felt. Cuff will be inflated with prescribed air in according to LMA size. Proper LMA placement will be confirmed with bilateral equally audible breath sounds, chest movements and capnography. The LMA insertion conditions shall be graded as acceptable provided no gagging, coughing or laryngospasm on first attempt of LMA insertion and unacceptable if there is gagging, coughing or laryngospasm that prevents ventilation on LMA insertion. LMA removed either by patient on full awakening or by the anaesthetist. Oxygen will be continued using facemask until full recovery and then the patient will be moved to PACU.

Data were fed and analyzed by using statistical software SPSS-version 10. Frequency and percentages were computed for the categorical variables like age groups, gender, ASA grades and condition of LMA insertion. Mean, standard deviation, 95% confidence interval, median with IQR were computed for quantitative variables like age and weight. Chi-Square test and fisher exact test was applied to observed rate of LMA insertion conditions between groups. Independent t-test and Mann Whitney test were used to compare mean difference between groups for age and weight. P<0.05 was considered significant.

**RESULTS**

All patients were randomly assigned to two groups, group I (intravenous lignocaine) and group T (topical lignocaine).

![Figure No.1: Comparison of gender between groups](image)

<table>
<thead>
<tr>
<th>GENDER</th>
<th>GROUP I</th>
<th>GROUP T</th>
<th>P-Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>15 (28.6%)</td>
<td>19 (33.3%)</td>
<td>0.75</td>
</tr>
<tr>
<td>Females</td>
<td>42 (71.4%)</td>
<td>48 (66.7%)</td>
<td>0.38</td>
</tr>
</tbody>
</table>

| Table No.1: Propofol and nalbuphine requirement |
| --- | --- | --- | --- |
| | Group I | Group T | P-Values |
| Total Propofol Dose (mg) | 115.37±14.53 | 117.09±13.86 | 0.51 |
| Nalbuphine Dose (mg) | 8.65±1.09 | 8.77±1.04 | 0.52 |
Table No. 2: LMA insertion conditions between groups with respect to gender

<table>
<thead>
<tr>
<th>LMA Insertion</th>
<th>Group I n=57</th>
<th>Group T n=57</th>
<th>Total n=114</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Male (n=28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable</td>
<td>11(91.7%)</td>
<td>15(93.8%)</td>
<td>26(92.9%)</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>1(8.3%)</td>
<td>1(6.3%)</td>
<td>2(7.1%)</td>
</tr>
<tr>
<td>For Female (n=86)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable</td>
<td>40(88.9%)</td>
<td>41(100%)</td>
<td>81(94.2%)</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>5(11.1%)</td>
<td>0(0%)</td>
<td>5(5.8%)</td>
</tr>
</tbody>
</table>

Table No. 3: LMA insertion conditions between groups with respect to age

<table>
<thead>
<tr>
<th>LMA Insertion</th>
<th>Group I n=57</th>
<th>Group T n=57</th>
<th>Total n=164</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Age Groups ≤ 30 (n=66)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable</td>
<td>35(97.2%)</td>
<td>30(100%)</td>
<td>65(98.4%)</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>1(2.8%)</td>
<td>0(0%)</td>
<td>1(1.6%)</td>
</tr>
<tr>
<td>For Age Groups &gt; 30 (n=48)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable</td>
<td>16(76.2%)</td>
<td>26(96.3%)</td>
<td>42(87.5%)</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>5(23.8%)</td>
<td>1(3.7%)</td>
<td>6(12.5%)</td>
</tr>
</tbody>
</table>

Table No. 4: LMA insertion conditions between groups with respect to weight

<table>
<thead>
<tr>
<th>LMA Insertion</th>
<th>Group I n=57</th>
<th>Group T n=57</th>
<th>Total n=83</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Weight ≤ 60 (n=75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable</td>
<td>35(94.6%)</td>
<td>38(100%)</td>
<td>73(97.3%)</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>2(5.4%)</td>
<td>0(0%)</td>
<td>2(2.7%)</td>
</tr>
<tr>
<td>For Weight &gt; 60 (n=39)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable</td>
<td>16(80%)</td>
<td>18(94.7%)</td>
<td>34(87.2%)</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>4(20%)</td>
<td>1(5.3%)</td>
<td>5(12.8%)</td>
</tr>
</tbody>
</table>

The mean age in group I was 30 +/- 9 years and in group T was 31 +/- 10 years. ASA I patients were 47 in group I while 41 in group T. ASA II patients were 10 in group I while 16 in group T. There were 86 females of which 45 females in group I and 41 females in group T. (fig.1) LMA insertion was compared among 86 females who underwent breast surgeries. Acceptable conditions in group I were in 40 (90%) while 41 (100%) patients in group T. Immediate pharyngo-laryngeal complications were noted in 5 patients (11.1%) in group I while none in group T patients. (tab.2) In patients less than 30 years (n=66), acceptable conditions in 35 patients (97%) in group I while 30 patients (100%) in group T while unacceptable in 1 patient in group I while none in group T. In more than 30 years, acceptable conditions in 16 patients (76%) in group I while 26 patients (96%) in group T, more complications in I group patients 5 (24%) while only 1 (4%) in group T (p<0.04). (tab.3) In patients more than 60 kilograms weight, acceptable conditions in 16 patients (80%) in group I while 18 patients (95%) in group T while unacceptable conditions in 4 patients (20%) in group I while in 1 patient (5%) in T group. (p=0.34) (tab. 4).

**DISCUSSION**

Anaesthesiologists strive for a technique that provides optimal conditions for the surgery, no or minimal complications and early discharge from hospital settings. Endotracheal tube and LMA comparison showed major complications with size, cuff pressures, laryngoscope sizes, anaesthetic agents and airway reflexes attenuation. Decreased pharyngo-laryngeal complications were reported by P. Thapa and colleagues using betamethasone gel for endotracheal tube intubation in comparison to lignocaine attributed to it’s anti-inflammatory effect and osmolality of jelly as a contributing factor for mucosal irritation. In a study conducted by Sara R. and colleagues comparison of LMA supreme with endotracheal intubation made. They have used muscle relaxant during induction. In all female breast surgery patients, they concluded reduced incidence of pharyngo-laryngeal complications with LMA usage. Different drug combinations been used in the past to prevent pharyngo-laryngeal complications. 65% success reported by Wong CM and colleagues in a study experimenting combination of propofol and fentanyl. Large doses of propofol failed to prevent pharyngo-laryngeal complications as observed by Kanzawa and team. In a landmark study, Cook and colleagues reported ninety patients and compared two different intravenous lignocaine doses (0.5mg/kg and 1.5mg/kg) vs topical lignocaine 10% before thiopentone intravenous induction. They reported success of 86% using topical lignocaine. Comparatively better airway reflex obtundation and deeper plane of anaesthesia by propofol as compared to thiopentone attributed for better results in our study. Propofol and nalbuphine synergistically induced a deeper plane of anaesthesia which allowed better conditions for placement of laryngeal mask airway.

Dental patients gagging observed to be reduced by using PC6 and CV24 points in acupuncture and is a point of future research in complications free airway management. In our study we observed gagging in nine patients of I group while only in two patients of T group. (p=0.026) This result is in line with the literature review that topical administration of lignocaine for adults by World federation of Anaesthesiologists. They have used muscle relaxant during induction. In all female breast surgery patients, they concluded reduced incidence of pharyngo-laryngeal complications with LMA usage. Different drug combinations been used in the past to prevent pharyngo-laryngeal complications. 65% success reported by Wong CM and colleagues in a study experimenting combination of propofol and fentanyl. In our study we observed gagging in nine patients of I group while only in two patients of T group. (p=0.026) This result is in line with the literature review that topical administration of lignocaine for adults by World federation of Anaesthesiologists. They have used muscle relaxant during induction. In all female breast surgery patients, they concluded reduced incidence of pharyngo-laryngeal complications with LMA usage.
CONCLUSION

Topical 4% lignocaine application spray over base of tongue and posterior pharynx area reduces immediate pharyngo-laryngeal complications in day case female patients more effectively than 2% intravenous lignocaine without using any intravenous muscle relaxation agent. Improving patient comfort and readiness for early discharge in ambulatory surgeries may be attributed to this anaesthesia technique.

Author’s Contribution:
Concept & Design of Study: Muhammad Shazad
Drafting: Syed Muhammad Nadeem
Data Analysis: Syed Muhammad Nadeem
Revisiting Critically: Muhammad Shazad, Syed Muhammad Nadeem
Final Approval of version: Muhammad Shazad

Conflict of Interest: The study has no conflict of interest to declare by any author.

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10. Adriaens E, Remon JP. Mucosal irritation potential of personal lubricants relates to product osmolality as detected by the slug mucosal irritation assay. Sex Transm Dis 2008;35: 512-16.
Association of Lemon Sign of Fetal Skull With Spina Bifida

Shams Munir¹, Ayesha Shams², Nasreen Hamid³, Kamran Hamid⁴ and Muhammad Sabir⁵

ABSTRACT

Objective: To study Association of lemon sign of fetal skull with spina bifida

Study design: Observational study.

Place and Duration of Study: This study was conducted at Allama Iqbal Memorial Teaching Hospital Sialkot during Jan 2018 to Jan 2020.

Materials and methods: Fifty cases of Association of lemon sign of fetal skull with spina bifida, were included in this study. Ultrasonography was conducted for all the fifty cases showing lemon sign of fetal skull to study the association of lemon sign with the spina bifida. Written informed consent of the parents was taken before collection of data. Permission of ethical committee was also considered for collection of data and publishing in medical journal.

Results: Among fifty fetuses showing lemon sign of skull, forty nine showed spina bifida. Only one fetus demonstrating typical lemon shaped skull showed no evidence of spina bifida or associated abnormality. All the fetuses demonstrating spina bifida also shown associated features suggestive of Chiari malformations.

Conclusion: Lemon sign shows a strong association with spina bifida and spina bifida is strongly associated with Arnold Chiari malformation.

Key Words: Lemon sign, Skull, Spina bifida, Chiari Malformation


INTRODUCTION

Spina bifida is a neural tube defect. It results from incomplete or aberrant fusion of posterior bony arches, anywhere along the spine¹. Earlier in 1970-80,s maternal serum alpha feto protein level was the main tool for screening the spina bifida by amniocentesis at/around 16 weeks². However invasive methods nearly replaced with development of better quality ultrasound machines and techniques. This better detection rate of spina bifida mainly attributed to the detection of abnormal cranial contour, described as lemon sign³,⁴,⁵. This sign depicts the abnormal fetal skull shaped due to symmetrical flattening /scalloping of bilateral frontal bones, elevating the normal convex contour of bilateral frontal bones, giving lemon shaped architecture to skull⁶,⁷. Many authors have shown the relation of lemon sign with spina bifida⁸,⁹.

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6. Received: February, 2020
7. Accepted: March, 2020
8. Printed: May, 2020

In many cases, lemon sign is more conspicuous than spina bifida itself⁵, so after finding lemon shaped skull, a careful search can be made to visualize the spinal defect. Detection of spina bifida at an earlier gestation would be beneficial. Parents prefer to be informed as early as possible in cases of significant abnormalities. If ultimate choice of the parents is to terminate pregnancy, it would also be safer and easier to performed at earlier gestation. Early diagnosis of spina bifida also allows time for detailed counselling and assessment, if in-utero closure is being considered. It is found that fetal surgery to close spina bifida between 19 to 26 weeks has better outcome as compared to postnatal repair¹⁰.

The present study is aimed to determine the validity of lemon sign in diagnosing the spina bifida. Result with high association of lemon sign and spina bifida will help to prevent missing of this anomaly in early stage of gestation, so that timely intervention in the form of In utero corrective procedures or therapeutic abortion can be planned.

MATERIALS AND METHODS

Fifty cases of Association of lemon sign of fetal skull with spina bifida, were included in this study. Ultrasonography was conducted for all the fifty cases demonstrating lemon sign of fetal skull to study the association of lemon sign with spina bifida. Findings of all the cases were correlated and reconfirmed by physical examination of newborn after delivery or therapeutic abortion. Written informed consent of the parents was taken before collection of data. Permission
of ethical committee was also considered for collection of data and publishing in medical journal.

Inclusion Criteria: Only those cases included in study, showing lemon shaped fetal skull on ultrasound.

Exclusion criteria: All those cases showing no evidence of lemon fetal shaped skull on ultrasound excluded from the study.

RESULTS

Among fifty cases showing lemon sign, forty nine cases showed evidence of spina bifida. Only one fetus showing lemon sign of skull showed no evidence of spina bifida as shown in Tab: 1.

Table No.1: Spina bifida in fetuses showing lemon sign.

<table>
<thead>
<tr>
<th>Number of fetuses with lemon sign</th>
<th>Detection of Spina bifida</th>
<th>Percentage of detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>Detected</td>
<td>98%</td>
</tr>
<tr>
<td>1</td>
<td>Not detected</td>
<td>2%</td>
</tr>
</tbody>
</table>

Table No.2: Location of spina bifida in fetuses showing lemon sign.

<table>
<thead>
<tr>
<th>Location of Spina bifida</th>
<th>Number of fetuses</th>
<th>Location percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoracolumbar</td>
<td>28</td>
<td>57.2%</td>
</tr>
<tr>
<td>Lumbar</td>
<td>12</td>
<td>24.5%</td>
</tr>
<tr>
<td>Sacral</td>
<td>8</td>
<td>16.3%</td>
</tr>
<tr>
<td>Suboccipital/High cervical</td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>

Table No.3: Association of spina bifida with Chiari malformation.

<table>
<thead>
<tr>
<th>Fetuses with Chiari malformation</th>
<th>Type of chiari malformation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>Type II</td>
<td>97.9%</td>
</tr>
<tr>
<td>1</td>
<td>Type III</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Figure No.1: Sagittal sonographic image showing meningocele, marked by arrow (a), illustration showing meningocele (b).

Distribution of location of spina bifida is shown in the table 2. All the cases showing spina bifida also showed associated features with variable severity like, small infra tentorial fossa, hydrocephalus, effacement of cisterna magna, banana shaped anteriorly concave cerebellum with cerebellar tonsilar herniation, suggestive of Chiari malformatin. Forty eight of these fetuses fall in category of Chiari II malformation and one of the fetus showing spina bifida with above mentioned associated features fall in Chiari III malformation, as shown in table 3.

DISCUSSION

Neural tube malformations are the 2nd most common serious congenital defects after congenital heart anomalies\(^1\). Worldwide prevalence of neural tube defect is 1-2 per 10,000 neonates\(^2\). Spina bifida is a form of neural tube defect, that occurs due to the failure of fusion of neural tube by 28 days of gestation, causing an opening of vertebra anywhere along the dorsal aspect of spine\(^3\). Spina bifida mainly classified into two groups: closed spina bifida (Spina bifida occulta) and Open spina bifida (Spina bifida aperta)\(^4\). Spina bifida occulta is a spinal malformations with intact overlying skin. Spina bifida occulta is rarely detected at early stage of gestation\(^1\). It will not be discussed further in the present description. Spina bifida aperta involves exposure of the spinal cord and meninges with no intact overlying skin. Spina bifida aperta comprises of Meyelocele, meningoymelocele and myeloschisis. A meningeal sac containing cerebrospinal fluid that protrudes out through the bony spinal defect is known meningocele, if neuronal elements like spinal cord and nerve roots also protrude into the sac, then it is called as meningoymelocele, as shown in figure 1. In case of myeloschisis neural tissue flush with the surrounding skin\(^3\). The most common location of spina bifida is lumbosacral region, but flat or small lesions can be a real challenge to find out at any level\(^5\). Spina bifida has a strong association with lemon sign of skull. The lemon sign represents the shape of the skull at ultrasound with medial displacement of bilateral frontal bones leading to inwards scalling of frontal bones abolishing their normal convex contour. This gives a lemon like configuration to the fetal skull\(^6,16\), shown in figure:2. To properly image this sign an axial image of fetal cranium is taken by ultrasound at the level of ventricles\(^6\).

Exact pathogenesis of this abnormal fetal cranial contour is unknown. However, it is hypothesized that in case of spina bifida, there is a decrease in intraspinal
pressure that causes the inferior displacement of hindbrain. It leads to decrease in intracranial pressure, which indirectly reflects as this abnormality of cranial contour, by inward scalloping of bilateral frontal bones. However with the progression of pregnancy the lemon sign disappears. The proposed reason behind this is that with advancement of gestation frontal bones become stronger enough to cope the stress of decreased pressure without deforming of the contour. The other described reason is that, majority of spina bifida cases also show progressing hydrocephalus. It causes increased intracranial pressure leading to reversal of inward scalloping of bilateral frontal bones to outward convex contour. However, this theory fails to explain the lemon sign in fetuses with normal posterior fossa. Therefore other opinion described by furness and colleagues is that lemon like appearance of the fetal skull in cases of spina bifida might be result of mesenchymal dysplasia of cranium due to primary skeletal developmental disorder.

Spina bifida also shows other associated abnormalities like hydrocephalus, obliteration/effacement of cisterna magna, abnormal anterior concavity or rolling of cerebellum around the brainstem (known as banana sign), most likely due to partial cerebellar tonsilar herniation through the foramen magnum, collectively these abnormalities described as Chiari malformation. With the continuous growth of the fetus, tethered cord at the level of spina bifida causes caudal traction of hindbrain, It might have a role in development of chiari malformation. Prevalence of Chiari malformation is 0.1 to 0.5%.

Many investigators have described utility of lemon signs in detection of spina bifida. In 1986 Nicolaides and coworkers in their retrospective study of 70 patients of open spina bifida ,first of all described the term lemon sign. In another study, Nyberg et al described that in fetuses with spina bifida ,lemon sign had a high sensitivity (93% [13 of 14]), specificity (99% [212 of 215]) and a positive predictive value (81%[13 of 16]) . However, a small percentage of structurally normal fetuses may demonstrate the lemon sign, as described by Campbell and associates, Nyberg and coworkers, Van den and co workers 1.2%, 1.3% and 0.66% respectively.

Rationale of this study was to gather and analyse data, about utility of lemon sign in detection of spina bifida in early gestation. In the present study fifty fetuses showing lemon shaped fetal skull before 24 weeks of gestation noted. Among these, forty nine fetuses showed open spina bifida. Only one fetus showing typical lemon like configuration of skull showed no abnormality of spine. A careful search was made to evaluate other associated abnormalities in this fetus during antenatal scans and after delivery neonate was physically examined but no gross abnormality noted. Excluding the terminated fetuses, the rest of the fetuses show no evidence of lemon sign on ultrasound during latter stages of pregnancy. Among forty nine cases of spina bifida, twenty eight showed spina bifida at lumbosacral region, twelve fetuses showed at lumbar region, eight fetuses showed at sacral region and one fetus showed meningiomyelocele at suboccipital/high cervical region. All the fetuses showing spina bifida also showed features suggestive of Chiari malformation that include small infra tentorial fossa, hydrocephalous, effacement of cisterna magna, banana shaped anteriorly concave cerebellum with cerebellar tonsilar herniation. Forty eight fetuses showed chiari II malformation, whereas one fetus showed Chiari III malformation. Chiari type II malformation is associated with lumbosacral spina bifida. Chiari type III malformation is a rare anomaly, associated with low occipital/high cervical meningiomyelocele/meningioencephalocele.

Our results are almost similar with the already published data on the same subject. However, Present study in additions to suggest, the usefulness of lemon sign in early detection of spina bifida ,also described a strong association of open spina bifida with Arnold chiari malformation.

Main ultrasound feature of spina bifida is the splaying of the posterior elements of spine. At many instances it is difficult to diagnose this lesion in early pregnancy, especially in cases, when the fetuses are not in optimal position. Lesions of lower lumbar or sacral spine can be particularly challenging to diagnose in early period of gestation. In these scenarios abnormal cranial contour in the form of lemon sign, strongly suggests careful evaluation, to find out likely spinal deformity.

CONCLUSION

Current study showed that though lemon sign not specific but is highly sensitive in diagnosing the spina bifida particularly in early pregnancy, where chance of missing the lesion is high. We also concluded in this study that there is a strong association of spina bifida with the Chiari malformation. It further stresses the need of early diagnosing the spina bifida by utilizing the lemon sign of fetal skull. Early diagnosis of spina bifida could have potentially important significance, It would allow the parents to gain sufficient time and information for management, which may include pregnancy termination, expectant, or fetal surgery.

Author's Contribution:
Concept & Design of Study: Shams Munir
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Nasreen Hamid
Data Analysis: Kamran Hamid,
Muhammad Sabir
Revisiting Critically: Shams Munir,
Ayesha Shams
Final Approval of version: Shams Munir
Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

Frequency of Depression Among Medical Students of Medical Colleges
Adil Afridi¹, Zainab Nawaz² and Shakeel Asif³

ABSTRACT

Objective: To determine the frequency of depression in under graduate students of Medical Colleges.

Study Design: Descriptive cross-sectional study.

Place and Duration of Study: This study was conducted at the Department of Psychiatry, Gajju Khan Medical College Swabi Pakistan from May 2018 to November 2018.

Materials and Methods: Two hundred and fifty medical students, 50 from each class were randomly selected for this descriptive cross section study. The students were first assessed for the presence of depression using the International Classification of Diseases 10 criteria. Those who were found to have symptoms of depression were then evaluated for the severity of depression using Beck's Depression Inventory.

Results: The mean age was 20.97±1.58 years. The mean Beck’s Depression Inventory score was 19.60±11.37. The lowest score on Beck’s Depression Inventory was 2 while the highest Beck’s Depression Inventory score was 52. There were 67 (26.80%) males and 183 (73.20%) females. Depression was found in 93 (37.20%) study participants. When depression was cross-tabulated against history of substance abuse and residence of study participants, P value was found <0.05.

Conclusion: There is a high prevalence of depression among medical students and it is significantly associated with history of substance abuse and residence.

Key Words: Anxiety, Depression, Illness, Morbidity, Stress, Medical school

INTRODUCTION

Education especially related with medical is a stressful phenomenon all over the world. Study overload is a main reason where medical students are not able to relax and recreational activities are also less in numbers. These are factors may lead to early exhaustion, over stressed, anxiety, depression, decreased attention and concentration. Medical students seem to be more stressed as compared to students of any other program.¹

Depression may lead to overall deterioration in medical training and education. These factors may lead to high risk behaviors, suicidal attempts, burn out, poor quality of life as compare to general population.²³

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

Medical education lead to high expectations, more pressure both physically and psychologically from the medical students leading to poor quality of life, less productivity, educational hurdles and compromised patients care.

In NMC, Multan a study⁴ concluded that anxiety and depression frequency was 43.89% among medical students of first, second, third, fourth and final years have following ratios of prevalence (45.86%, 52.58%, 47.14%, 28.75% and 45.10% respectively) of depression and anxiety. Some studies report has high percentage of neurotic disorders among the females. Factors may be over-concern, over expectation and stress, low self esteem and self competence and exaggeration of symptoms.⁵ A study conducted in Rawalpindi reported that anxiety & depression were present (47.7%, 35.1% respectively) among the students. This ratio was found to be higher in 2nd year medical students as compared to 3rd and 4th year students.⁶

An India study concluded that the depression frequency was 71.25% among the both male and female medical students (80% mild – moderate, severe 7.5%, profound 6.7%) where 46.3% were females and 53.7% were males. Grades of depression and sex association was insignificant.⁷

A study done in Nepal has revealed the depression prevalence was 29.78 %. The prevalence of depression in first and third year medical students were 36.74 and 22.22% respectively, with female have more prevalence as compared to males (32.43% vs. 28.07%).⁸
Depression among clinical under-studies speaks to a dismissed general medical issue in Pakistan. It is critical to forestall the evil impacts of gloom on one's instructive fulfillment and profession through early discovery and legitimate interventional measures. In Pakistan there have been constrained investigations on predominance of despondency in clinical under-studies. This examination will assist with thinking about the recurrence of sorrow among clinical under-studies of various years. By recognizing sadness among clinical under-studies at a beginning period, we can forestall mental grimness among the clinical under-studies and the ones in bleak state can benefit from outside assistance to look for the expert.

MATERIALS AND METHODS

This descriptive cross sectional study was carried out at Department of Psychiatry, Gajju Khan Medical College Swabi Pakistan from 10th May 2018 to 9th November 2018. 250 medical students, 50 from each class were randomly selected for this descriptive cross section study. Medical students who have spent more than 6 months in medical college, no co-morbid physical and psychiatric illness and students who have given consent were included. Students with previous history of depression were excluded. A pre-designed proforma was given to the study participants and all the relevant details such as age, gender, year of study, marital status, family income, and residence were noted. Among the participants 34 (36.56%) study participants had mild depression, 17 (18.28%) study participants had moderate depression and 23 (24.73%) study participants had severe depression according to Beck's Depression Inventory. When depression was cross-tabulated against history of substance abuse and residence of study participants p value was found to less than 0.05. Depression was not found to be associated with age, gender, marital status, socioeconomic status, and year of study (Tables 2-3).

RESULTS

The mean age of study participants was 20.97±1.58 years. The age of the youngest study participant was 17 years and the age of the oldest study participant was 25 years. Among the study participants with depressive illness, the mean BDI score was 19.60±11.37. The lowest score on BDI was 2 while the highest BDI score was 52. There were 67 (26.80%) males and 183 (73.20%) females. Majority of the study participants were single (230; 92%). 19 (7.60%) were married while 1(0.4%) was a divorcee. Most of the study participants had a better socio-economic background with 118 (47.20%) study participants reported that the monthly income of their family was more than 80,000 rupees. 87(34.80%) study participants reported a family income between Rs. 40,000 and Rs. 80,000. Thirty-nine (15.60%) study participants had a monthly income between Rs. 21,000 and Rs. 40,000. Only six (2.40%) study participants reported that their monthly income was less than Rs. 20,000. Only 20 (8%) study participants reported a history of substance abuse. Most of the study participants (184; 73.60%) were day scholars (Table 1).

Depression was found in 93 (37.20%) study participants; 19 (20.43%) study participants had minimal depression, 34 (36.56%) study participants had mild depression, 17 (18.28%) study participants had moderate depression and 23 (24.73%) study participants had severe depression according to Beck's Depression Inventory. When depression was cross-tabulated against history of substance abuse and residence of study participants p value was found to less than 0.05. Depression was not found to be associated with age, gender, marital status, socioeconomic status, and year of study (Tables 2-3).

Table No.1: Demographics of all the study participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>20.97±1.58</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>67</td>
<td>26.8</td>
</tr>
<tr>
<td>Female</td>
<td>183</td>
<td>73.2</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>230</td>
<td>92</td>
</tr>
<tr>
<td>Married</td>
<td>19</td>
<td>7.6</td>
</tr>
<tr>
<td>Divorced</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Family Income (PKR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;80000</td>
<td>118</td>
<td>47.2</td>
</tr>
<tr>
<td>40 to 80K</td>
<td>87</td>
<td>34.8</td>
</tr>
<tr>
<td>21k to 40k</td>
<td>39</td>
<td>15.6</td>
</tr>
<tr>
<td>&lt;20k</td>
<td>6</td>
<td>2.4</td>
</tr>
<tr>
<td>History of substance abuse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td>8.0</td>
</tr>
<tr>
<td>No</td>
<td>230</td>
<td>92.0</td>
</tr>
</tbody>
</table>

Table No.2: Severity of depression among study participants (n=250)

<table>
<thead>
<tr>
<th>Severity of depression</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Depression</td>
<td>176</td>
<td>63.4</td>
</tr>
<tr>
<td>Mild Depression</td>
<td>34</td>
<td>13.60</td>
</tr>
<tr>
<td>Moderate Depression</td>
<td>17</td>
<td>6.80</td>
</tr>
<tr>
<td>Severe Depression</td>
<td>23</td>
<td>9.20</td>
</tr>
</tbody>
</table>
Around the globe medical education is considered as main source of stressful life cycle. Over emphasis and over load of medical knowledge, information may lead to less chances of relaxation and entertainment, serious consequences could be insomnia, lack of judgment, disturbed attention and concentration, low self-esteem, poor judgment and neurotic disorders. Medical students are reported to be more stressed as compared to students of any other specialty.\(^1\)

Medical students experience more stress, often have financial burden, leads to suicidal ideations and over burdened studies and immense family expectations, tough academic routines, courses, long hours workings, assignments, trainings, duty hours, presence of illnesses and increased death rates.\(^2\)

Tough medical education definitely has impact on physical and mental health of students with tough routines, difficult studies and narrow employment chances. These generations of medical students are valuable for the society but negative impact of studies may lead to less production, impaired quality of life, also patients care suffers more.

In Nishtar Medical College, Multan Pakistan, a research study found out that prevalence of anxiety and depression was 43.89% among medical students. High prevalence of depression noted in female medical graduates.\(^3\) An Indian study found that the overall prevalence of depression was found to be 71.25% with predominant mild to moderate cases and again females showed more percentage as compared to males.\(^4\)

A medical college study in Nepal found out the overall prevalence of depression among the students was 29.78% with females have more prevalence as compared to males.\(^5\)

In this study depression was found to be present in 93 (37.20%) respondents. These results are comparable with comparable studies from near-by countries\(^6,9\) and some local studies.\(^10\) However, there is a difference in the prevalence of depression among medical students in different parts of the world. A study done in UK reported lower rates of depression (10.6%-18.2%) among medical students.\(^10\)

An India study used PHQ-9 and revealed that depression and major depressive illness were 21.5% and 7.6%, respectively. Year of study, academic performance, substance misuse; residential areas have significant impact on depression prevalence.\(^11\) A Malaysian study reports 1.9% prevalence rate for depression among medical students. The study concluded that depression was associated with academic performance in class (p < 0.001) and race (p=0.004).\(^12\) A study done by Iqbal and colleagues\(^13\) revealed the percentage of depression, anxiety and stress among medical students using the Depression Anxiety Stress Scale (DASS 42) with 51.3% depression prevalence. More stress, depression was observed in final years as compare to initial classes, where females were more affected with depression as compared to males.

In Saudi Arabia DASS-21 questionnaire was applied in a medical college study for a Pre-Exam and Post-Exam fashion with n=575. Pre- exam levels were (43%, 63%, and 41%, respectively) were compare to post-exam (to 30%, 47%, and 30%, respectively) of depression, anxiety and stress which are astonishingly less, where females and smokers have high prevalence as compared to others.\(^14\) A comparative study\(^15\) was done in Middle East, China, USA medical schools to reveal exact percentages of depression, anxiety and stress by using the scale PHQ-2. Middle Eastern medical students have (41.1%) prevalence of depression, followed by China (14.1 %), and then the US (3.8%). Unmet mental health services noted in Middle Eastern school (50.8%) where as in China (34.8%) and in USA (32.8%). Depression prevalence internationally may be changed by race, cultural effects, prevailing circumstances and unmet needs of mental health services and medical help may have good impact on overall prevalence of depression in every part of the world and response rate differences might have influenced the outcomes, our results suggest that continued efforts toward identifying site-specific prevention and intervention strategies in medical student mental health are warranted, and that additional socio-cultural variable should be studied.

## CONCLUSION

Undergraduate medical students have been the most distressed group of students compared to undergraduates from any other course or specialty. Depression is associated with a stigma of its own and many depressed patients fail to seek treatment because of the stigma associated with the treatment or visiting the psychiatrist.

### Author’s Contribution:

- **Concept & Design of Study:** Adil Afridi
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- **Drafting:** Adil Afridi, Shakeel Asif
- **Revisiting Critically:** Adil Afridi, Zainab Nawaz
- **Final Approval of version:** Adil Afridi
Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES
Comparison of Outcomes Between Antibiotics Treatments Versus Appendectomy Patients With Uncomplicated Acute Appendicitis

Jehangir Khan¹, Muhammad Kashif², Ramzan³ and Muhammad Bilal⁴

ABSTRACT

Objective: To comparison between antibiotic therapy and appendectomy in patients presented with uncomplicated acute appendicitis.

Study Design: Randomized controlled trial

Place and Duration of Study: This study was conducted at the Department of Surgery Bacha Khan Medical Complex Swabi from March 2019 to February 2020.

Materials and Methods: One hundred and thirty patients of both genders presented with uncomplicated acute appendicitis were included and divided all the patients equally into two groups A and B. Each group comprised 65 patients. Group A received appendectomy while group B received antibiotic treatment. Outcomes such as hospital stay, complications, recurrence within one year and patient’s satisfaction were examined.

Results: There were 40 (61.54%) male and 25 (38.46%) female patients in group A with mean age 30.06±8.72 years while in group B 36 (55.38%) male and 29 (44.62%) were females with mean age 29.42±9.65 years. Significant difference was observed regarding hospital stay between group A and B (2.02±0.85 days Vs 6.28±2.44 days) p-value 0.001. Regarding complications group B had overall lower rate of complications as compared to group A [(2 (3.08%) Vs 10 (15.38%)] a significant difference was observed between both group (p=0.02). In group A 1 (1.54%) patient develop recurrence while in group B 16 (27.69%) developed recurrence within 1 year. In group A 63 (96.92%) patients were satisfied while in group B 44 (67.69%) patients were satisfied with treatment modality.

Conclusion: Surgical treatment is safe and effective treatment modality with higher patients satisfaction and successful treatment rate as compare to antibiotics treatment.

Key Words: Uncomplicated acute appendicitis, Antibiotic drugs, Appendectomy, Hospital stay, Recurrence, Patients satisfaction


INTRODUCTION

Appendicitis is the most well-known earnest condition by and large careful practice with a frequency ~100/100,000/year, and higher pervasiveness in men than ladies (8.6% versus 6.7%).¹² Standard treatment is appendectomy (i.e., open and laparoscopic appendectomy).

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Received: March, 2020
Accepted: April, 2020
Printed: May, 2020

Around 310,000 appendectomies are performed/year in the United States, of which 250,000 have positive an infected appendix¹, giving a negative appendectomy pace of about 15% to 30%.² Appendectomy itself is related with intra and post-usable morbidities including vascular wounds, urinary tract inconveniences, hematomas, colonic fistulas, careful site diseases, bonds, inside deterents, and huge length of medical clinic stay.²⁻⁶ The post-employable complexity rate ranges from 2% to 23% and over 3% of patients are readmitted with intestinal obstacle and post-usable grip.⁷⁻⁸ Traditionalist treatment with anti-infection agents is an elective decision for an infected appendix; in spite of the fact that the danger of disappointment is about 13% higher, yet the danger of confusions is lower. Traditionalist treatment with anti-infection agents for simple a ruptured appendix is a topical issue by and large medical procedure and there are numerous investigations in kids, grown-ups and blended populaces (kids and grown-ups) individually.⁹⁻¹¹ Among 13 precise surveys in grown-ups, 10 audits
considered just randomized controlled preliminaries (RCT) distributed during 1995 to 2015 with the quantity of included RCTs running from 3 to 6. Among them, all aside from one audit pooled adequacy and confusions among anti-infection agents and appendectomy applying meta-examination. Albeit different anti-infection agents (for example third era of cephalosporin, metronidazole, penicillin, and betalactamase) had been utilized, they were crumpled into one classification when contrasted and appendectomy.10 We conducted present study with aimed to examine the effectiveness of antibiotic treatment and compare it with surgical treatment (appendectomy).

MATERIALS AND METHODS

This randomized controlled trial was conducted at Department of surgery Bacha Khan Medical complex, Swabi during from the period 1st March 2019 to 28th Feb 2020. During this period 130 patients of both gender presented with uncomplicated acute appendicitis were analyzed. Patients ages were ranging between 15 to 45 years. We divided all the patients equally into two groups A and B and each group consist of 65 patients. Patients demographics including age, sex, body mass index, and symptoms were recorded after taking informed consent. Patients with recurrence, complicated appendectomy and those with refusal of consent were excluded. Group A patients were received surgical treatment (open or laparoscopic appendectomy) while group B received antibiotic treatment. In antibiotic group 250 mg of ciprofloxacin and 500 mg of metronidazole were given three times a day for 5 days. Treatment outcomes were examined in term of hospital stay, complications such as wound infection, perforation, nausea vomiting, and abdominal abscess. Recurrence rate was examined within 1 year after treatment between both groups. All the data was analyzed by SPSS 24. Chi-square test was applied to compare the outcomes between both groups. P-value <0.05 was taken as statistically significant.

RESULTS

There were 40 (61.54%) male and 25 (38.46%) female patients in group A with mean age 30.06±8.72 years while in group B 36 (55.38%) male and 29 (44.62%) were females with mean age 29.42±9.65 years. Mean BMI in group A was 26.42±3.6 kg/m² and in group B it was 25.54±4.7 kg/m². Pain in lower quadrant was found in all the patients of both groups 100%. Loss of appetite found in 18 (27.69%) in group A and 20 (30.77%) in group B, 15 (23.08%) in group A and 18 (27.69%) in group B patients had nausea and vomiting, fever found in 15 (23.08%) in group A and in group B it was found in 13 (20%) patients. We found no significant difference regarding age, gender, BMI and symptoms between both groups (p>=0.05) (Table 1).

We found a significant difference regarding hospital stay between group A and B (2.02±0.85 days Vs 6.28±2.44 days) p-value 0.001.

Table No.1: Age, sex, BMI and symptoms between both groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group A</th>
<th>Group B</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Yrs)</td>
<td>30.06±8.72</td>
<td>29.42±9.65</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>40 (61.54%)</td>
<td>36 (55.38%)</td>
<td>N/S</td>
</tr>
<tr>
<td>Female</td>
<td>25 (38.46%)</td>
<td>29 (44.62%)</td>
<td></td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>26.42±3.6</td>
<td>25.54±4.7</td>
<td>N/S</td>
</tr>
<tr>
<td>Symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain in lower quadrant</td>
<td>65 (100%)</td>
<td>65 (100%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Loss of Appetite</td>
<td>18 (27.69%)</td>
<td>20 (30.77%)</td>
<td></td>
</tr>
<tr>
<td>Nausea &amp; Vomiting</td>
<td>15 (23.08%)</td>
<td>18 (27.69%)</td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>15 (23.08%)</td>
<td>13 (20%)</td>
<td></td>
</tr>
</tbody>
</table>

Table No.2: Hospital stay and overall complications between both groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group A</th>
<th>Group B</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital stay (days)</td>
<td>2.02±0.85</td>
<td>6.28±2.44</td>
<td>0.001</td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (15.38%)</td>
<td>2 (3.08%)</td>
<td>0.002</td>
</tr>
<tr>
<td>No</td>
<td>55 (84.62%)</td>
<td>63 (96.92%)</td>
<td></td>
</tr>
</tbody>
</table>

Table No.3: Treatment success rate and patients satisfaction between both groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group A</th>
<th>Group B</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment successful</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>64 (98.46%)</td>
<td>49 (75.38%)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>1 (1.54%)</td>
<td>16 (27.69%)</td>
<td></td>
</tr>
<tr>
<td>Patients satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>63 (96.92%)</td>
<td>44 (67.69%)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>2 (3.08%)</td>
<td>31 (47.69%)</td>
<td></td>
</tr>
</tbody>
</table>

Regarding complications group B had overall lower rate of complications as compared to group A [(2 (3.08%) Vs 10 (15.38%)] a significant difference was observed between both group (p=0.02). Regarding complications in group A 3 patients developed wound infection, 3 had perforation, 3 had nausea vomiting and
1 with fever and in group B 2 patients had abdominal abscess (Table 2). Regarding recurrence with 1 year after treatment, we found that in group A 1 (1.54%) patient develops recurrence while in group B 16 (27.69%) developed recurrence. A significant difference was observed between both groups A and B with p-value <0.001.

Overall successful treatment rate was high in group A as compared to group B 64 (98.46%) Vs 49 (75.38%), a significant difference was observed between both groups with p-value 0.024. According to patients satisfaction in group A 63 (96.92%) patients were satisfied while in group B 44 (67.69%) patients were satisfied with treatment modality (Table 3).

**DISCUSSION**

Appendicitis is one of the most common painful disorders found all over the world and appendectomy is the common surgical intervention performed in surgical settings. Many of treatment modalities have been used for the treatment of appendicitis in which antibiotic therapy and surgical treatment have been widely used. However surgical treatment considered as treatment of choice because of better efficacy, low recurrence and cost effectiveness. In present study 130 patients were analyzed and divided into two groups, one group received antibiotic therapy and one received surgical treatment (appendectomy). Overall male patients were high in numbers 76 (58.46%) as compared to females 41.54% with mean age 29.8±8.42 years. These results showed similarity to many of previous study in which males were predominant 55% to 68% as compared to females and average age of patients were 25 years.

In our study we found that appendectomy treatment group had less hospital stay 2.02±0.85 days (ranges 1 to 3 days) as compared to antibiotics treatment group 6.28±2.44 days (ranges 3 to 10 days), a significant difference was observed between both groups with p-value <0.001. A meta analysis conducted by Salminen et al reported that median hospital stay in antibiotic and appendectomy groups was 3 days. However patients treated with antibiotics had hospital stay ranges 3 to 20 days. Another study conducted by Ibrahim et al reported that surgical treatment group had longer hospital stay 3.6±1.2 as compared to medical treatment group 2.2±0.3 days with p-value <0.05.

In present study we found that overall complications rate was high in appendectomy group 15.38% as compared to antibiotics group 3.08%. Some of studies demonstrated that appendectomy had high complications rate 10 to 25% as compared to antibiotic treatment. However, some of studies reported no significant difference regarding complications between both treatment modalities.

In this study regarding recurrence with 1 year after treatment, we found that in group A 1 (1.54%) patient develops recurrence while in group B 16 (27.69%) developed recurrence. A significant difference was observed between both groups A and B with p-value <0.000. These results were comparable to many of previous studies in which surgical treatment had less recurrence rate and high efficacy rate as compared to antibiotics groups. We found that overall successful treatment rate was high in group A as compared to group B 64 (98.46%) Vs 49 (75.38%), a significant difference was observed between both groups with p-value 0.024. According to patients satisfaction in group A 63 (96.92%) patients were satisfied while in group B 44 (67.69%) patients were satisfied with treatment modality. These results showed similarity to many of previous studies in which appendectomy resulted better efficacy with higher patients satisfaction rate as compared to antibiotic treatment.

**CONCLUSION**

Surgical treatment is safe and effective treatment modality with higher patients satisfaction and successful treatment rate as compare to antibiotics treatment. However complications rate was high in appendectomy treated patients. We found no major complication in both groups.

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4. Omundsen M, Dennett E. Delay to appendicectomy and associated morbidity: a
Determine the Frequency of Surgical Wound Infection in Patients Undergoing Elective and Emergency Abdominal Surgery

Muhammad Kashif\textsuperscript{1}, Jehangir Khan\textsuperscript{2}, Ziaullah\textsuperscript{1} and Muhammad Bilal\textsuperscript{3}

ABSTRACT

Objective: To examine the incidence of surgical wound infection in patients undergoing elective and emergency abdominal surgeries.

Study Design: Prospective/observational study

Place and Duration of Study: This study was conducted at the Department of Surgery, Bacha Khan Medical complex Swabi during from April 2019 to Dec 2019.

Materials and Methods: Three hundred and twenty patients of both genders were underwent abdominal surgeries. Patient’s ages were ranging from 5 to 65 years. Patients detailed demographics including age, sex, BMI, type of surgery, comorbidities were recorded after informed consent. Incidence of post-operative wound infection was examined and compare the findings between elective and emergency surgeries.

Results: One hundred and ninety (59.38%) were males while 130 (40.62%) were females. 64 (20%) patients were ages ≤20 years, 160 (50%) were ages 21 to 40 years, 70 (23.75%) were ages 41 to 60 years and 20 (6.25%) had ages above 60 years. 120 (37.5%) patients were underwent elective and 200 (62.5%) underwent emergency surgeries. Overall post-operative wound infection was found in 52 (16.25%) patients while 268 (83.75%) patients had no wound infection. In elective surgeries 8 (6.67%) patients developed wound infection while in emergency surgeries 44 (22%) developed wound infection, a significant difference was observed between elective and emergency abdominal surgeries with p-value 0.012.

Conclusion: The frequency of wound infection in our settings was high in patients received elective and emergency abdominal surgeries. Moreover, rate of surgical wound infection was high in emergency surgeries as compared to elective.

Key Words: Abdominal surgery, Elective, Emergency, Post-operative wound infection


INTRODUCTION

Postoperative wound infection, otherwise called surgical site infections (SSIs), confound the recuperation course of numerous patients. As characterized by the Centers for Disease Control and Prevention (CDC), these contaminations regularly happen inside 30 days of an activity at the site or part of the body where the medical procedure occurred, or inside a year if an embed is left set up and the disease is believed to be optional to medical procedure.\textsuperscript{1,3}

Bacterial colonization on the patient's skin and nutritious and genital tract are the chief contributing sources that lead to SSIs.\textsuperscript{4} The living being regularly disconnected is Staphylococcus aureus.\textsuperscript{5} Exogenous sources, for example, penetrates in clean method and working room gear may contribute, but significantly less often than endogenous greenery. Microscopic organisms inside the tissue or organ space frustrate the postoperative mending forms, and can prompt anastomotic releases, wound dehiscence, and shallow incisional contaminations.\textsuperscript{6}

The paces of SSI are a lot higher with stomach medical procedure than with different sorts of medical procedure, with a few planned examinations showing a frequency of 15%–25% relying upon the degree of tainting.\textsuperscript{7,8} Careful site disease is preventable and is related with high dismalness and mortality. Notwithstanding the overwhelming effect on the patient's course of treatment, it is related with delayed length of medical clinic remain and greater expenses.\textsuperscript{9}

Different hazard factors for SSI have been recognized after some time and would all be able to be accumulated inside at least one of the three significant
determinants of SSI: bacterial components, nearby twisted variables, and patient elements. Bacterial variables remember harmfulness and bacterial burden for the careful site. Length of preoperative remains, remote site contamination at the hour of medical procedure, and term of the methodology have likewise been related with an expanded bacterial burden and SSI rate.\textsuperscript{10} Nearby twisted components are identified with the intrusiveness of an activity and to explicit specialist's practices and careful strategy. Great careful strategy while overseeing tissues (neighborhood twisted) in the most fitting way and utilizing stitches, channels, and outside bodies just with sufficient sign is the most ideal approach to keep away from SSIs.\textsuperscript{11} The present study was conducted aimed to examine the incidence of wound infection in patients undergoing elective and emergency abdominal surgeries.

\section*{MATERIALS AND METHODS}

This prospective/observational study was conducted at Department of Surgery Bacha Khan Medical complex Swabi from 1\textsuperscript{st} April 2019 to 31st Dec 2019. A total 320 patients of both genders undergoing elective and emergency abdominal surgeries such as appendectomy, hernia repair, pancreatitis, laparotomy, colon injuries, cholecystectomy and urethroplasty were included in this study. Patient’s ages were ranging from 5 to 65 years. Patient’s detailed demographics including age, sex, BMI, type of surgery (elective and emergency), co-morbidities such as diabetes mellitus, anemia, hypertension, and smoking were recorded after informed consent. Patients with gynecological disorders, surgeries other than abdominal, patients with liver cancer and those with no consent were excluded. All the patients were received elective or emergency surgery whether it was laparoscopic or open procedure. Post-operative wound infection was examined at post-operative 1 week and at 1 month. Types of wound infection such as superficial and deep surgical site infection were examined. Compare the findings between elective and emergency surgeries. Data was analyzed by SPSS 24. Chi-square test was applied to compare the frequency of wound infection between elective and emergency surgeries. P-value <0.05 was taken as statistically significant.

\section*{RESULTS}

There were 190 (59.38\%) were males while 130 (40.62\%) were females. 64 (20\%) patients were ages ≤20 years, 160 (50\%) were ages 21 to 40 years, 70 (23.75\%) were ages 41 to 60 years and 20 (6.25\%) had ages above 60 years. 120 (37.50\%) patients were underwent elective and 200 (62.50\%) underwent emergency surgeries. Mean BMI of all the patients was 26.25±4.32 kg/m\textsuperscript{2}. The most common co-morbidity was anemia found in 76 (23.75\%) patients followed by diabetes in 60 (18.75\%) patients, hypertension in 52 (16.25\%) patients and smoking found in 48 (15\%) patients respectively (Table 1). Overall post-operative wound infection was found in 52 (16.25\%) patients in which 36 (11.25\%) developed superficial while 16 (5\%) developed deep surgical site infection while 268 (83.75\%) patients had no wound infection (Fig. 1). According to the comparison of postoperative wound infection between elective and emergency surgeries we found that in elective surgeries 8 (6.67\%) patients developed wound infection while in emergency 44 (22\%) developed wound infection, a significant difference was observed between elective and emergency abdominal surgeries with p-value 0.012 (Table 2).

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|}
\hline
\textbf{Variables} & \textbf{No.} & \textbf{\%} \\
\hline
\textbf{Gender} & & \\
Male & 190 & 59.38 \\
Female & 130 & 40.62 \\
\hline
\textbf{Age (Years)} & & \\
<20 & 64 & 20.0 \\
21 to 40 & 160 & 50.0 \\
41 to 60 & 76 & 23.75 \\
Above 60 & 20 & 6.25 \\
\hline
\textbf{Surgery type} & & \\
Elective & 120 & 37.50 \\
Emergency & 200 & 62.50 \\
\hline
\textbf{Co-morbidities} & & \\
Anemia & 76 & 23.75 \\
Diabetes & 60 & 18.75 \\
Hypertension & 52 & 16.25 \\
Smoking & 48 & 15.0 \\
\hline
\textbf{BMI (kg/m\textsuperscript{2})} & 26.25±4.32 & \\
\hline
\end{tabular}
\caption{Demographics of all the patients}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|}
\hline
\textbf{Post-operative wound infection} & \textbf{Elective} & \textbf{Emergency} & \textbf{P-value} \\
\hline
Yes & 4 (6.67\%) & 22 (22\%) & 0.012 \\
No & 56(93.33\%) & 78 (78\%) & \\
\hline
\end{tabular}
\caption{Comparison of wound infection between elective and emergency abdominal surgeries}
\end{table}
DISCUSSION

Abdominal surgeries such as appendectomy, gastrointestinal, exploration laparotomy, pancreatitis, and cholecystectomy were the most common surgeries performing in any surgical settings. Post-operative wound infection is the most frequent post-operative complication in abdominal surgeries and it can lead to increase hospital stay, cost and impacted worsened in patients. In surgical settings elective and emergency surgeries are performing. Patients with critical condition may receive emergency and patients with non-critical condition first received medical treatment than take these patients towards surgical intervention. We performed this study to examine the frequency of post-operative wound infection in patients undergoing elective and emergency abdominal surgeries. In this study total 320 patients received elective or emergency abdominal surgeries during the study period. Male patients were high in numbers 59.38% as compared to female 40.62%. Majority of patients (70%) were ages less than 40 years. These results showed similarity to many of previous studies in which males were predominant as compared to females and accounted 55% to 65% and the average age of patients whom were received abdominal surgeries was 26 years. In present study we found that 120 (37.5%) patients were underwent elective and 200 (62.5%) underwent emergency surgeries. Mean BMI of all the patients was 26.25±4.32 kg/m². The most common co-morbidity was anemia found in 76 (23.75%) patients followed by diabetes in 60 (18.75%) patients, hypertension in 52 (16.25%) patients and smoking found in 48 (15%) patients respectively. A study conducted by Alkaaki et al reported that 76.3% patients were underwent elective surgery while 23.7% were underwent emergency surgery and among all the patients diabetes mellitus was the most common co-morbidity reported in 20.8% patients followed by smoking. We found that the overall incidence of post-operative wound infection reported in 52 (16.25%) patients in which 36 (11.25%) developed superficial while 16 (5%) developed deep surgical site infection while 268 (83.75%) patients had no wound infection. A study conducted by Prashant et al demonstrated that the overall incidence of wound infection was 24% and among elective surgery it was 4% and in emergency surgery in was 44%. Another study conducted by Kumar et al regarding incidence of wound infection in elective and emergency abdominal surgeries and they reported that surgical site infection was observed in 12.5%. Among the 3 types, superficial incision SSI was most prevalent followed by deep incisional SSI and finally by organ/space SSI. Some other previous studies showed similarity to over study findings regarding wound infection in which wound infection reported 15% to 40% patients and superficial infection was the most common surgical site infection. In present study according to the comparison of postoperative wound infection between elective and emergency surgeries we found that in elective surgeries 8 (6.67%) patients developed wound infection while in emergency 44 (22%) developed wound infection, a significant difference was observed between elective and emergency abdominal surgeries with p-value 0.012. These results were similar to the study by Kumar et al in which patients with emergency surgery had high rate of wound infection as compared to elective surgery. A study by Tan et al reported dissimilarity in which elective surgery reported a higher rate of SSIs, 19.40%, as compared with 15.47% in emergency surgery. Nagur et al reported that the incidence of wound infection was high in patients underwent emergency surgery as compared to the elective surgery.

CONCLUSION

The frequency of wound infection in our settings was high in patients received elective and emergency abdominal surgeries. Moreover, rate of surgical wound infection was high in emergency surgeries as compared to elective. Superficial surgical site infection was most common among all the patients.

Author’s Contribution:
Concept & Design of Study: Muhammad Kashif
Drafting: Jehangir Khan
Data Analysis: Ziaullah, Muhammad Bilal
Revisiting Critically: Muhammad Kashif, Jehangir Khan
Final Approval of version: Muhammad Kashif

Conflict of Interest: The study has no conflict of interest to declare by any author.

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CONCLUSION

In this link write the goals of the study but avoid unqualified statements and conclusions not completely supported by data.

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When appropriate, may be included.

ACKNOWLEDGMENTS

List of all contributors who do not meet the criteria for Authorship, such as a person who provided purely technical help, writing assistance or department chair who provided only general support. Financial & Material support should be acknowledged.

REFERENCES

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