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Original Articles

Editorial

Benefits of Healthy Eating and Calories Burn

Mohsin Masud Jan
Editor

Who eat home-cooked meals five or more times per week were 28 percent less likely to be overweight and 24 percent less likely to have excess body fat than those who ate at home fewer than three times per week. That's according to a 2017 study involving more than 11,000 people published in the International Journal of Behavioral Nutrition and Physical Activity. The researchers found that those who dined at home ate more fruits and vegetables, too.

A research has shown that when vegetables are competing with other – possibly more appealing – items on your plate, you eat less of them. But when you get the vegetables alone, you eat more of them. Make a salad and sit down to eat it before you put any other food on the table. You'll not only eat more vegetables, you'll also fill up a bit so that you eat less.

A 2016 study published in JAMA Internal Medicine found that replacing animal protein with an equivalent amount of plant protein was associated with a lower risk of mortality, especially from heart disease.

Many people think of nuts as having a lot of calories and fat, but they typically don't cause people to pack on the pounds. Plus, they help reduce the risk of heart disease and type 2 diabetes, according to several studies. For instance, almonds have more fiber than many other nuts and supply calcium, while walnuts are packed with a heart-healthy omega-3 fatty acid.

More than 40 percent of the carbohydrates we consume are low in nutritional quality, according to a 2019 study published in JAMA. Simply switching from refined grains to whole grains, such as farro, bulgur, oatmeal, and even popcorn, can increase your fiber intake and help keep you full. In one study published in 2011 in the New England Journal of Medicine, adding just one serving of whole grains per day led to an average weight loss of about a third of a pound over four years.

A recent study suggests that exchanging one serving per day for a glass of water could help reduce overall calorie intake and the subsequent risk of obesity, lowering your risk of developing type 2 diabetes by 14 to 25 percent. Take a look at your fruit juice intake, too. Even 100 percent fruit juices can contribute a lot of calories and sugars to your diet.

Obesity is associated with health risks[1]. Monitoring the prevalence of obesity is relevant for public health programs that focus on reducing or preventing obesity. No significant changes were seen in either adult or childhood obesity prevalence in the United States between 2003–2004 and 2011–2012[2]. This report provides the most recent national data on obesity prevalence by sex, age, and race and Hispanic origin, using data for 2011– 2014. Overall prevalence estimates from 1999–2000 through 2013–2014 are also presented.

A new research suggests that a bacteria Lactobacillus found in fermented foods and yogurt may help prevent depression and anxiety. Researchers at the University of Virginia School of Medicine have discovered that the bacterium Lactobacillus helps the body manage stress, potentially preventing the onset of mental health conditions like depression and anxiety.

Dr. Bankole Johnson, neuroscientist in Miami agrees and said that this study highlights the role of gut microbes on stress and anxiety, and in turn, how diet affects our mental wellbeing. "Microbiota influences brain signaling, and so changes in microbiota alter brain stimulation. The gut is often called the "second brain" due to the bidirectional communication between the gut and the central nervous system. When abundant in the gut, Lactobacillus appears trusted Source to modulate this communication, influencing the production of neurotransmitters like serotonin and gamma-aminobutyric acid (GABA), which play key roles in mood regulation.

A scientist recommends increasing your intake of Lactobacillus by incorporating fermented foods such as yogurt, kefir, sauerkraut, kimchi, and pickles into your diet. Ideally, you'll consume one serving of fermented food per day. Beyond Lactobacillus-rich foods, a diet rich in omega-3 fatty acids (found in fatty fish, flaxseeds, and walnuts) has been associated with reduced depressive symptoms. A scientist said that antioxidant-rich fruits and vegetables, whole grains, and foods containing magnesium (like leafy greens, nuts, and seeds) may also be beneficial for mental health.

Eating healthy has many benefits;

- Reduce the risk of heart disease and diabetes mellitus
- Improve brain function
- Stronger bones and teeth
- Better mood
- Better sleep
- Improve digestive function
- Stronger immune system
- More energy
- Fewer eye problem
- Less joint pain

- Improved gut health
- Eating lean proteins, whole grains, healthy fats, fruits and vegetables.
- Limiting foods, high in sugar, salt, fat and refined carbs.
- Choosing whole fruits instead of juices
- Swapping soft drinks for water or herbal tea
- Ensuring each meal consist of some fresh produce.

After healthy eating calories can burn and broken-down into four categories[3].

1. Basal Metabolic Rate (BMR)
2. Thermal Effect of Food (TEF)
3. Exercise Energy Expenditure (EEE)
4. Non-Exercise Activity Thermogenesis (NEAT)

The BMR represents approximately 60% of TEE. The TEF also contributes to TEE, and by some estimates composes as much as 10% of TEE. The mechanism by which energy is expended with food ingestion and digestion, including mastication, digestion, absorption, and transportation of nutrients, constitutes the TEF. The inter individual variability of the TEF is not reviewed herein, but note that compared with lean individuals, the TEF in obese people is reduced, with studies suggesting a lower level of sympathetic nervous system activation[4] and a diminished thermogenic response to the high-carbohydrate meal.[5]

The greatest impact on how many calories you burn while working out.

Body Weight: Generally, the more you weigh, the more calories you'll burn per session. Calories are just a measure of energy, so the more you weigh, the more energy it takes to move your body. Put differently, of two people with different weights, the one who weighs more will burn more calories, because they have a greater energy expenditure when moving. People with larger bodies also tend to have larger internal organs which is a significant factor in how many calories are burned during exercise and at rest, because these organs and their processes require energy. This is one of many reasons that weight loss is so complicated – your body burns fewer calories as your weight decreases, which can lead to a weight loss plateau or even regaining weight.

Muscle Mass: Someone with more muscle mass will burn more calories than someone else who weighs the same but has less muscle. Muscle tissue burns more calories than fat tissue. During exercise, having more muscle mass will increase your total calorie burn, because your body needs to produce more energy to support the increased rate at which your muscles are contracting. Long story short, if you want to enhance your calorie burn, consider stepping up your strength-training game.

Age: After age 30, you begin to lose as much as 3 to 5 percent of your muscle mass per decade. The reasons for this aren't perfectly understood, but one review explains that it's likely because your body becomes more resistant to hormones that promote the protein synthesis that's key to muscle maintenance. This loss of muscle mass lowers your metabolic rate – the speed at which you burn calories – at rest and during exercise.

Fitness Level: The more you do a certain type of workout, the easier it seems. That's not in your head – your body actually does adapt to do things more easily over time. Overall, this is a good thing. It means that you can run faster or for longer with practice, and your muscles will be able to lift heavier weights with proper training. But it also affects your calorie burn. "As your body adapts to training, you will burn less calories with the same workouts. From your lungs to your muscles to your heart to your brain, your body becomes more efficient as you become more fit. That's why a newbie might burn significantly more calories than someone who's been doing the same workout for years.

Training Intensity: It's also possible that two people doing the same workout are burning a different number of calories because they're not actually doing the same workout. Someone exercising at a high intensity, meaning you're breathing heavily and can't carry on a conversation, can burn twice as many calories in the same amount of time as someone exercising at a low intensity.

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Original Article

Outcomes of Ponseti Technique for Idiopathic Clubfoot in Children Presenting Up to Three Years of Age

Mohammad Aslam Mengal[1], Saddam Mazar[2], Nargis Taj[3], Waseem Bari[2], Mohib Ullah Durrani[2] and Mohib Ullah Musakhail[2]

ABSTRACT

Objective: This purpose of this study is to evaluate the outcomes of Ponseti manipulation and casting technique in treating Idiopathic Congenital Clubfoot in children under three years of age.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Department of Orthopaedic Surgery, SKBZ Medical Complex Quetta from 1st September 2021 to 31st August 2022.

Methods: The study included 93 feet of 55 patients with idiopathic club foot deformity, of both genders, age from 1 week to 3 years. The deformities were corrected using the Ponseti manipulation and casting technique. Pirani Scoring System was utilized, while SPSS version 16.0 used to analyse the data.

Results: In this study, we included 55 clubfoot patients, 93 feet, with 37 males and 18 females. 9 cases had right-sided involvement, and 38 were bilateral. The pre-correction Pirani score ranged from 4 to 6, with a mean of 5.7, while post-correction scores ranged from 0 to 1, with a mean of 0.5. The mean age of the patients was 2.2 years, ranging from one week to three years. The Ponseti method resulted in 92.7% excellent outcomes.

Conclusion: We concluded that Ponseti technique was non-invasive, safe and provides efficient, satisfactory outcomes for the management of idiopathic congenital clubfoot in children presenting up to the age of three years.

Key Words: Idiopathic Congenital talipes equinovarus, Pirani scoring, Ponseti technique.

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INTRODUCTION

Idiopathic Talipes EquinoVarus (CTEV), commonly known as Clubfoot, is among the most prevalent congenital orthopaedic conditions, affecting approximately one in every 1,000 live births globally. This congenital deformity presents as a complex three-dimensional malformation characterized by a combination of four distinct features: ankle equinus (downward pointing of the foot), hind foot varus (inward turning of the heel), forefoot adductus (inward turning of the forefoot), and midfoot cavus (high arch).

The exact etiology of CTEV remains idiopathic, although several studies suggest a multifactorial origin, implicating genetic, environmental, and possibly vascular factors in its development [1,2].

CTEV is clinically significant not just because of its high prevalence, but also because untreated cases can produce severe and disabling conditions. In the long-run, there are challenges that individuals with CTEV may have to contend with, if the condition is not properly treated, or is well managed. The deformity may progress to chronic pain, restrictions to joint movement and severe functional impairment in even simple daily activities, diminishing the affected person's quality of life. Leaving clubfoot untreated inhibits a person's ability to perform activities of daily living and can lead to social stigma in societies where treatment options are very poor[3, 4]. In addition, when CTEV is poorly managed, this will also contribute to the significant economic burden on the health care system in the future due to the costs of subsequent management, surgical treatment, rehabilitation and provision of assistive devices as needed[5].

The main goals of clubfoot treatment are to rehabilitate normal walking function, achieve a painless, plantigrade foot, and ensure functionality of the limb[1,5]. These goals need to be achieved as quickly as possible, so that the patient and their family do not suffer too much disturbance to their financial and social circumstances. Addressing clubfoot has always been problematic because of the condition owing to the need

1. Department of Orthopaedic Surgery & Paediatric Surgery, Head of Department Orthopaedics, SKBZ, Quetta.
2. Department of Orthopaedic Surgery, SKBZ, Quetta.
3. Department of Gynaecology, BMC, Quetta.

Correspondence: Dr. Mohammad Aslam Mengal, Department of Orthopaedic Surgery Sheikh Khalifa Bin Zayyad (SKBZ) Al Nahyan Medical Complex, Quetta, Balochistan.
Contact No: 0334-3345607
Email: mamengal@gmail.com

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for quick and effective intervention. In the past, extensive surgical releases were the leading treatment approach to this condition. Although these procedures were able to assist in correcting the abnormality, they came with a variety of other several long-term complications as well. This included the recurrence of the treated deformity, stiffness of the joint, and adjacent joint diseases or deformities including the knee and thigh[6,7]. Such issues were often of such a nature that further treatment could be required which in turn increased the overall morbidity and healthcare costs associated with the disease process.

Over the last two decades, the Ponseti technique has undoubtably revolutionized the treatment of idiopathic clubfoot becoming the best practice worldwide. The Ponseti method is a non-invasive technique that uses manipulation maintained with plaster of paris casting in order to achieve progressive and gradual correction of the deformity. This pionering method, developed by Dr. Ignacio Ponseti in the Mid 20th Century, received attention for its effectiveness and successful long-term outcomes with less aggressive procedures[8]. Many studies demonstrate that longitudinal practices of using the Ponseti method effectively correct the deformity but at the same time decreases the percentage of operations, thus contributing to the reduction of negative effects in the long run [9,10].

Notwithstanding the good responses to the Ponseti method, the treatment of Clubfoot has its challenges. The deformity is still recurrent after the treatment, especially if the initial severity of the deformity is high or the Ponseti casting system is applied inappropriately[11]. Brace compliance after treatment, which is a fundamental step of the Ponseti method, was amongst the factors which increased the rate of recurrence. This is especially common where there is lack of sufficient education among the parents or some cultural practices do not allow for the treatment to be followed or adhered through as recommended[12]. It cannot be overstressed that regular follow up and the facilitation of parents are vital in ensuring that favorable long-term results are achieved.

Additionally, the socio-economic factors and situations strongly influence the success of the Ponseti method where it is implemented[13, 16]. In low- and middle-income countries, health care resources were not adequate to attend all cases of CTEV using the Ponseti method, with follow-up care, because of general difficulties as the availability of qualified health workers, treatment costs, and logistical problems[13,17,18]. This requires a multi-modal approach to addressing these challenges which includes: strengthening health systems, access to treatment and keeping the parents informed and supported throughout. Overall, the Ponseti method represents a radical new era in Clubfoot management and is an extremely efficient as well as non-invasive alternative to conventional surgical procedures. The Ponseti method could greatly benefit course of the disease and mitigate relapse and non-compliance by avoiding reasons to undergo relapsing care, reduce treatment costs with no significant side effect which help make it feasible in our context. Further research and innovation in clubfoot treatment is essential to maximizing the success of the Ponseti method, so that all children can walk without a disability regardless of their demographics and socioeconomic status.

METHODS

A total of 55 individuals were included in the study, of which 93 had affected legs.

Inclusion criteria were patients aged one week to three years, male and female, with idiopathic clubfoot deformity. Severity of deformity was assessed using the Pirani scoring system. We also included recurrent and neglected cases of idiopathic clubfoot.

Patients with non-idiopathic causes of deformity such as neuromuscular disorders or syndromic conditions such as arthrogryposis were excluded. In addition, cases with opposite deformities, acquired equinovarus deformities, and cases of postoperative relapses were not included in the study.

Study data were collected prospectively using a systematic proforma that included demographic information, affected side, severity of deformity, number of casts required, tenotomy requirement, and post-treatment outcomes such as Pirani score. Data on compliance with the brace regimen and follow-up were collected. The obtained data were analysed using SPSS version 16.0. Data were summarized using descriptive statistics such as frequencies, percentages, means and standard deviations. The success of the Ponseti method was measured by comparing Pirani scores before and after treatment.

The management embraced of, all babies underwent the Ponseti method; a non-surgical serial casting that allows correction of clubfoot. The Ponseti method stresses gentle, painless manipulation and gradual corrections on a weekly basis. Correct application of casts by an experienced orthopaedic specialist is accompanied with monitoring for circulation and soft tissue integrity. The casts are made of plaster of Paris, moulded carefully to hold the foot in place, snug but not tight enough to impair circulation. The process is repeated until satisfactory correction of the deformity is achieved.

The major components of the Ponseti Technique are its weekly correction with the help of the casts for 5 to 7 days before change of the cast. These weekly intervals promote the adaptation of soft tissues preventing their overload and allows gradual correction to normal foot alignment. The average amount of casts in the treatment is usually 5-7; although this number can vary depending on the severity of the clubfoot. Correction of the

deformity occurs in stages, starting with the forefoot and midfoot and then the heel, which is usually in an equinovarus position.

In the majority of cases, once the foot is nearly corrected and/or for patients with residual equinus deformity, a minor procedure for Achilles tendon percutaneous tenotomy is performed under local anaesthesia. This procedure helps release the tight Achilles tendon to allow the foot to achieve normal dorsiflexion. A final cast is then applied after tenotomy, usually for about three weeks, to allow the tendon to heal in its lengthened position.

Following the correction, patients are provided with Denis Brown shoes, which are set at 70 degrees of abduction on the corrected side and 45 degrees on the normal side. This bracing is intended to maintain the correction and prevent recurrence. The bracing protocol requires the shoes to be worn full-time for the first three months, followed by night-time and nap-time use for up to the age of four years.

The Ponseti method used for the correction of club foot treatment, including a cast and a brace, will last about 4 years of age to keep your child's feet in proper alignment and prevent recurrence. Frequent check-ups that begin with every 1-2 weeks and then every 3-6 months, are essential for following treatment progress as well compliance. Parents are taught the full process of seeking and adhering to treatment, as well as early recognition of complications and maintaining proper foot hygiene.

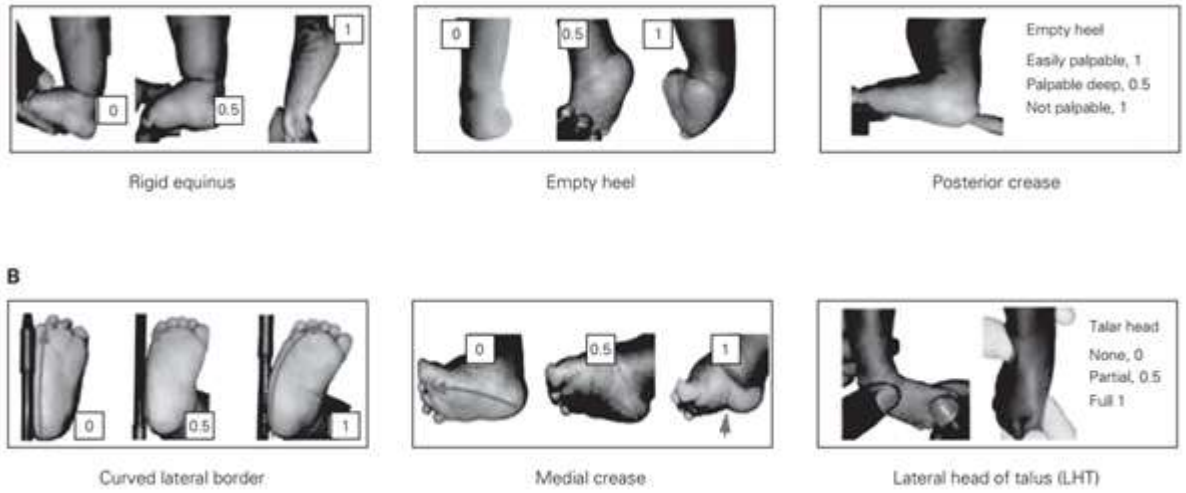

Figure: Pirani scoring system for clubfeet. (A) Hindfoot score (HS); (B) midfoot score (MS). Total score = (HS + MS) ÷ 6.

RESULTS

Table No. 1: Various variables with their values.

Variable		Value
Total number of patients		55
Total number of feet		93
Laterality	Right-sided involvement	9 (16.4%)
	Left-sided involvement	8 (14.5%)
	Bilateral involvement	38 (69.1%)
Case Type	Neglected cases	25 (45.5%)
	Recurrence cases	9 (16.4%)
Patient Age	Mean age	2.2 years
	Age range	1 week to 3 years
Treatment Method	Corrected with Ponseti serial casting alone	11 (20%)
	Required percutaneous tendo achillis tenotomy	44 (80%)
Casting Information	Number of casts (range)	3 to 9
	Average number of casts	5.8

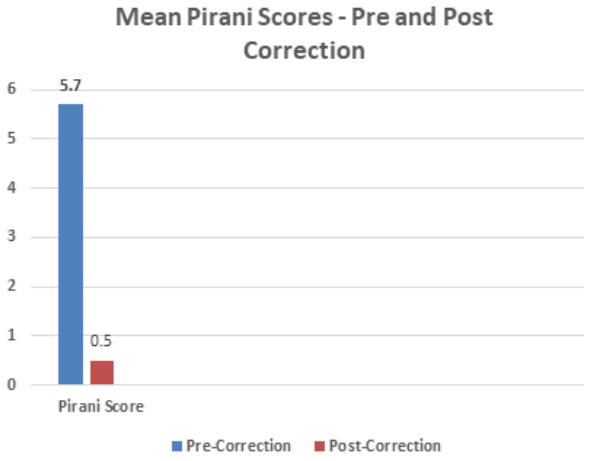

Figure No. 1: Graph demonstrating the Pre correction Pirani score of 4-6 with a mean value of 5.7, and post correction score of 1 to 0 with a mean value of 0.5.

In this study, we included 55 clubfoot patients, totalling 93 feet, with 37 males (67.3%) and 18 females (32.7%). The Ponseti method resulted in 92.7% excellent outcomes, although 5 patients were lost to follow-up, 4

discontinued bracing, and 2 opted for surgery due to recurrence and travel difficulties secondary to low socioeconomic status.

DISCUSSION

In the present study, we aimed to evaluate the outcomes of the Ponseti technique in treating patients with idiopathic clubfoot deformity (CTEV), on a group of 55 patients comprised all together as being with 93 affected legs. There was male preponderance as reported by demographic distribution, in which 67.3% were males and the remaining 32.7% of patients were female. This distribution is evidenced through literature that indicates CTEV occurs more often in men than women[6]. The majority of cases were bilateral (69.1%), which is also consistent with the known tendency of clubfoot to manifest bilaterally in a significant proportion of patients[6, 17].

One notable aspect of this study is the inclusion of neglected (45.5%) and recurrent (16.4%) cases, which are often more challenging to treat due to increased rigidity and severity of deformity. Nevertheless, the Ponseti method showed excellent results with a mean post-corrected Pirani score of 0.5 versus pre-corrected (mean) score of 5.7. This identifies the effectiveness of the technique in achieving almost complete correction, considering complex cases of neglected and recurrence CTEV, with after Ponseti management.

The mean age of the patients upon treatment was 2.2 years, with a window between one week and three years old. The presence of patients under three years old is remarkable and shows the flexibility and effectiveness of the Ponseti technique in treatment for older children, where deformity may manifest more evident or resistance to correction. Previous studies demonstrated satisfactory outcomes in older children with the Ponseti method, even when more casts or interventions such as tenotomy are required[5].

Complete correction was achieved in 80% of patients using a percutaneous Achilles tenotomy, in this study. This is similar to other reports that often tenotomy is required in a significant number of cases for residual equinus correction[6]. The mean casts applied were 5.8 ranging from 3 to 9 casts. This is consistent with standard Ponseti protocol and usually includes between 4 to 8 casts depending on the severity of deformity and responsiveness to treatment[7]. After corrective management, patient was given Denis Brown shoes for 70 degrees abduction on corrected side and 45 degrees on normal side. This is a standard brace intended to hold the correction which has been achieved by casting. Although this treatment is successful in general, compliance is the main issue; 5 patients lost to follow-up and 4 patients abandoned the braces. These two factors are the most important in avoiding the relapse. Noncompliance with the brace has been clearly identified as a major risk factor for clubfoot relapse following Ponseti treatment[6,7,8]. Two other parents opted for surgical management due to associated recurrence, reasoned with burden from socioeconomic conditions, distance to travel for follow-ups and further demonstrating the persistent struggles surrounding clubfoot management in resource limited settings[9, 10].

The excellent results obtained in 92.7% cases in this study justifies the Ponseti method as the gold standard of treatment for idiopathic clubfoot. The results are in accordance with the expected findings from other centers indicating high correction rate and low rate of or relapse to clubfoot when managed by Ponseti method[11,13]. This study is also a reminder and highlights the importance to consider the factors to compliance, socioeconomic conditions and accessibility to health care, which overall ensure the long-term success and adherence to the management [12].

Controlled trials and multi institutional cohort studies will continue to add weight to the base of evidence existing in literature, that majority children with idiopathic CTEV can be effectively treated by Ponseti technique even at a later age, relapse & recurrence cases as well as neglected/treated cases or when other procedures have failed. The high success rate demonstrated by this study, indicates the reliability of the method and that further controlled interventions will be necessary to follow up on cases with greater compliance within studies aimed at improving adherence rates for treatment protocols.

CONCLUSION

In this study we concluded that Ponseti technique was non invasive, safe and provides efficient, satisfactory outcomes for the management of idiopathic congenital clubfoot in children presenting up to the age of three years.

Limitations: Firstly, the study sample size was relatively small, which may limit the generalizability of the results to larger populations. Additionally, the study was conducted at a single medical center, meaning the outcomes may not fully reflect variations in treatment protocols or expertise across different institutions. Compliance with the bracing protocol was self-reported by caregivers, introducing potential bias or inaccuracies in data collection.

Author's Contribution:

Concept & Design of Study:	Mohammad Aslam Mengal
Drafting:	Saddam Mazar, Nargis Taj
Data Analysis:	Waseem Bari, Mohib Ullah Durrani, Mohib Ullah Musakhail
Revisiting Critically:	Mohammad Aslam Mengal, Saddam Mazar, Nargis Taj

Final Approval of version: By all above authors

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Original Article

Assessing Dental Educators' Preparedness for E-Learning: A Cross-Sectional Multi-Country Analysis

Hatim Mohammed Almahdi[1], Muhammad Adeel Ahmed[2], Rizwan Jouhar[2], Ramy Moustafa Moustafa Ali[3,5], Nazargi Mahabob[1] and Elwalid Fadul Nasir[4]

ABSTRACT

Objective: This study assessed dental educators' self-perceived readiness for e-learning in multiple institutions in six different countries.

Study Design: A cross-sectional study

Place and Duration of Study: This study was conducted at the College of Dentistry, King Faisal University Al- Ahsa, Saudi Arabia, from April to September 2023.

Methods: Participants were invited via email to complete an online survey, which was based on the Teacher Readiness for Online Learning Measure (TRLOM) scale, to assess their readiness for online learning. Participants were recruited using convenience and snowball sampling methods. The study included educators from Egypt, India, Nigeria, Pakistan, Saudi Arabia, and Sudan.

Results: This study included 96 dental educators; 53.1% were males, and 81.3% were in public institutes. The institutes provided just (8.3%) of the internet access devices for the educators. A majority (57.3%) of the educators showed high communication self-efficacy, (53.1%) showed high-perceived institutional support, (49%) rated themselves as self-directed learners, and (62.5%) stated high learning transfer self-efficacy. The learning transfer self-efficacy construct significantly correlated with all other constructs, which indicates that these are essential factors for the success of the e-learning process. It was also clear that the educator's self-directed learning significantly correlated with institutional support and communication self-efficacy.

Conclusion: Dental educators in investigated institutes showed confidence in their self-perceived readiness for e-learning. However, institutional support is crucial to overcome resource limitations and enhance e-learning effectiveness. Institutions must take proactive steps to prepare and motivate educators to transition to e-learning.

Key Words: e-learning, Dental educators, readiness, Dental education

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INTRODUCTION

Online learning, also known as e-learning, has been around since 1980; it involves acquiring knowledge through electronic technologies and media channels [(1)]. It has been defined as "electronically enabled learning". Different terms have been reported in the literature to describe e-learning including mobile, distance, remote, and digital learning [(2)]. Although there is no consensus on terminology, experts agree that e-learning is a form of distance learning that utilises various technologies and content [(1)].

E-learning has recently gained popularity in higher education, particularly dentistry, due to its appeal and flexible learning opportunities. Following the COVID-19 pandemic, there was a significant shift from traditional to e-learning in most of the higher academic institutions. This shift to e-learning poses several challenges for dental educators, who may feel unprepared to use this method as a teaching tool, especially in six different countries. However, the shift to e-learning poses several challenges for dental educators, who may feel unprepared to use this method as a teaching tool[(3)].

Electronic-readiness (E-readiness), the preparedness of a certain group to engage in the information society, is essential in designing and organizing e-learning programs[(4)]. Educators' confidence and readiness are

[1.] Department of Oral and Maxillofacial Surgery and Diagnostic Sciences / Restorative Dental Sciences[2] / Prosthodontics and Dental Implantology[3] / Preventive Dental Sciences[4], College of Dentistry, King Faisal University, Al Ahsaa, 31982, Saudi Arabia.

[5.] Department of Prosthodontics, Faculty of Dentistry, Fayoum University, Fayoum, Egypt.

Correspondence: Muhammad Adeel Ahmed, Department of Restorative Dental Sciences. College of Dentistry, King Faisal University, Al Ahsaa, 31982 Saudi Arabia.
Contact No: +966581674914
Email: mshakeel@kfu.edu.sa

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crucial to both traditional and e-learning systems and significantly influence students' outcomes.

Hung et al.[5] developed the Teacher Readiness for Online Learning Measure (TROLM) to assess e-learning readiness of educators using four domains: communication self-efficacy (CSE) in "text-based online asynchronous discussion"; institutional support (IS); self-directed learning (SDL), "a process in which learners take the initiative and responsibility for establishing personal learning goals"; and learning-transfer self-efficacy (LTSE), "how individuals effectively apply the skills and knowledge gained from a training program to a job situation."

Assessing dental educators' e-readiness is crucial in identifying areas needing additional training to use online tools effectively, ensuring high-quality education for students and aiding educational institutions in transitioning to e-learning[6]. This is particularly challenging in six different countries due to financial constraints. Hence, this study evaluates dental educators 'perceived e-readiness in six different countries.

METHODS

Study design and sampling: A descriptive cross-sectional study evaluated dental educators' perceived e-readiness for e-learning in six different countries (Egypt, India, Nigeria, Pakistan, Saudi Arabia, and Sudan) from April to September 2023. An online questionnaire was sent to dental educators who are working in academic institutions, having converted at least one physical teaching session to e-learning, having internet access, and being able to read and understand English.

The survey targeted dental educators using convenience and snowball sampling strategies. Authors and collaborators shared the online survey link with their contacts, who distributed it via social media groups and institutional email lists. One private and one public institute were selected in each of the six countries to ensure broad geographic coverage.

Questions and measures: The data were collected using a structured questionnaire. The first part of the questionnaire included questions about socio-demographic information: age, gender, type of institution, and academic rank. Furthermore, the questionnaire contained additional aspects regarding online learning devices, kind of internet connection, educators' views on internet cost, and time spent online.

The second section of the questionnaire assessed dental educators' perceived readiness for e-learning using the 18-item TROLM scale, comprising four domains. The domains and their corresponding Cronbach alpha values are:

- Communication Self-Efficacy (CSE): 4 items, $\alpha = 0.70$
- Institutional Support (IS): 5 items, $\alpha = 0.77$
- Self-Directed Learning Evaluation (SDL): 4 items, $\alpha = 0.63$
- Learning-Transfer Self-Efficacy (LTSE): 5 items, $\alpha = 0.84$

Each domain's score was calculated by summing the respective items, providing a comprehensive measure of dental educators' perceived readiness for e-learning.

Participants' responses were grouped based on agreement or disagreement using a 5-point Likert scale. "Strongly agree" and "agree" indicated agreement, while "strongly disagree" and "disagree" indicated disagreement. Response frequencies were then classified as high or low, using the mean as the cut-off point.

Data analysis: The data collected were organised, categorised, tabulated, and analysed using Statistical Package for Social Science (SPSS, 21). The data were presented as descriptive statistics, and the t-test and One-way analysis of variance (ANOVA) were used with a significance threshold of $p \leq 0.05$ and a confidence interval of 95%.

RESULTS

This study, which included ninety-six dental educators from six countries, revealed a diverse academic landscape.

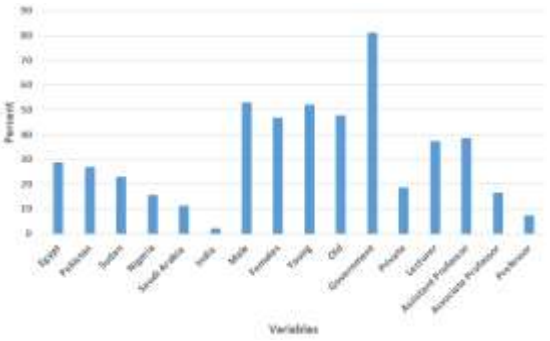

Figure No. 1: Percentages of the demographic characteristics of dental educators.

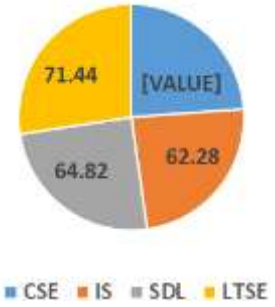

Figure No. 2: Percentages of High Agreement with TRLOM construct

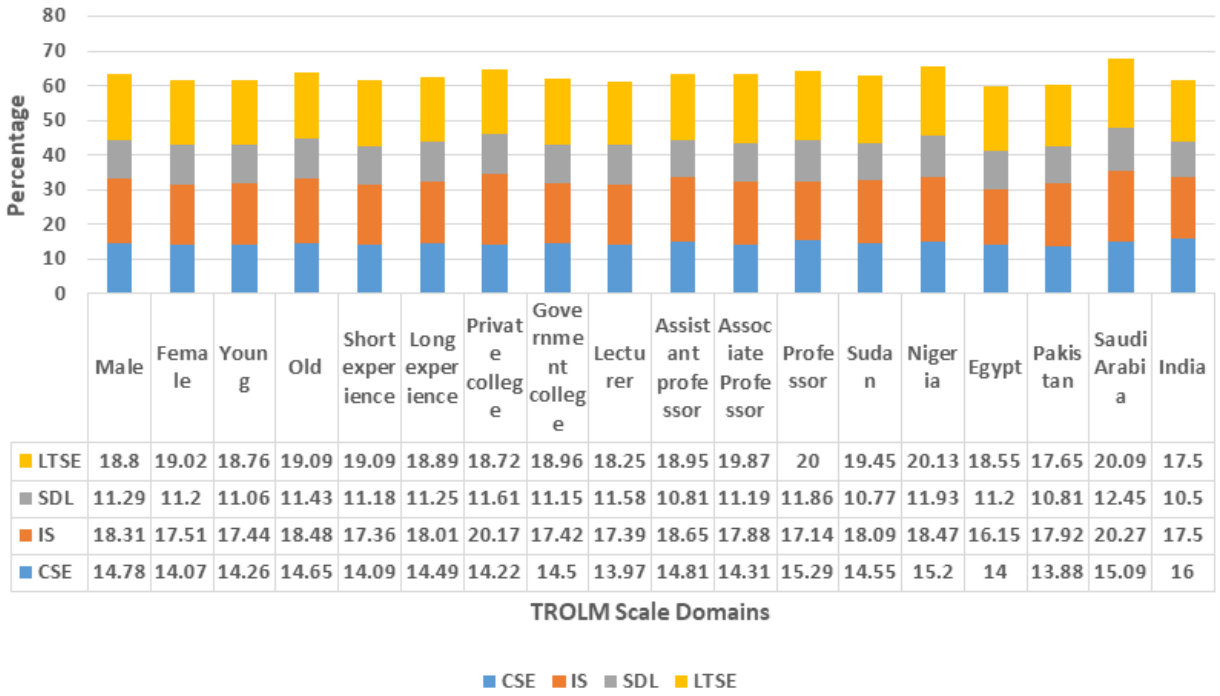

Figure No. 3: Descriptive t-test statistics of gender, age, experience, college type, position, and country on TROLM constructs (CSE, IS, SDL and LTSE).

The LTSE construct, with its significant correlations to the SDL, IS, and CSE constructs emerges as a pivotal factor in educators' learning transfer. Furthermore, the strong correlations between educators' SDL, IS, and CSE (as shown in Table 1) further emphasize the interconnectedness of these constructs.

IS was used to explain CSE, SDL, and LTSE and was tested using linear regression analysis. IS accounted for 9.6% of the variance in CSE [(R2 0.096, P ≤ .000), correlation coefficient (r= 0.324, P = .001)], 17% of the variation in SDL [(R2 0.17, P ≤ .000), correlation coefficient (r = 0.423, P = .000)], and 25.7% of the variation in LTSE [(R2 0.257, P ≤ .000), correlation coefficient (r = 0.515, P = .000)]. LTSE increases with the increase in CSE, IS, and SDL by 0.29, 0.25, and 0.08, respectively (Table 1).

Table No. 1: Linear regression of Institutional Support (IS) on TROLM dimension CSE, SDL, and LTSE (N. 96).

Construct	**Mean**	**S. D.**
LTSE	18.92	3.457
CSE	14.45	2.714
IS	17.94	3.524
SDL	11.24	1.945

Model	R	R^2	A. R^2	S. E.	Change Statistics				
					R^2	F	df1	df2	Sig. F
1	0.718[a]	0.516	0.500	2.445	0.516	32.655	3	92	0.000

a. Predictors: (Constant), SDL, CSE, IS

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95% Confidence Interval for B
		B	SE.	Beta			
1	(Constant)	1.400	1.808		0.775	0.440	-2.190-4.990
	CSE	0.288	0.101	0.226	2.863	**0.005	0.088-0.488
	IS	0.248	0.080	0.253	3.084	**0.003	0.088-0.407
	SDL	0.792	0.147	0.446	5.404	**0.000	0.501-1.084

a. Dependent Variable: LTSE

DISCUSSION

The present study assessed the e-learning readiness of dental educators in six different countries using the TROLM scale, which explores four domains of educators' readiness: SDL, IS, CSE, and LTSE[5].

The findings of this study indicate that most educators demonstrated a high level of CSE. However, it's

important to acknowledge that technological difficulties can hinder educators' progress in e-learning education, a challenge faced by many professionals in the field. Effective dental educators must have good CSE in diverse educational settings. Research has shown that increased participation in online discussions (related to CSE) is linked to positive attitudes towards learning and improved student experiences[7, 8]. Another study suggested that e-learning and teaching enhance student discussion through forums, emails, and chats [9].

Indian dental educators scored the highest in CSE among the participants in this study, which can be attributed to the high levels of IS, according to Mahajan et al.[10]. Those participants with more extended experience had better CSE, which agrees with other studies[11,12].

In this study, nearly half of the dental educators rated their institutional support (IS) as low, which negatively affected their motivation to participate in e-learning. This finding is consistent with other studies that have shown educators in higher education need adequate support in designing, implementing, and maintaining online teaching programs[13]. In this study, IS explained all other domains to various degrees (Table 1), which means that enhancing e-readiness requires a significant improvement in IS. This improvement would include, in addition to IS domain items, having issues resolved quickly, technical troubleshooting, advice on technical capabilities, provision of time needed to implement online teaching, and consideration of workload by institutions[14]. Dental educators' readiness relies on IS. Emphasising the institute's commitment can significantly impact e-readiness success[15-17]

According to this study, half of the educators reported high engagement in SDL, identifying their learning needs and goals, selecting the appropriate resources, and evaluating their progress with or without help[18]. As SDL is a vital aspect of e-learning, teachers must cultivate self-discipline to enhance their abilities[7].

Dental educators who are confident in applying their knowledge from online courses to their teaching roles (LTSE) find satisfaction in facing challenges and sharing ideas. Positive attitudes towards e-learning have increased satisfaction and the likelihood of applying this knowledge to their job performance. Furthermore, studies have revealed that an organisation's learning culture significantly impacts employee motivation and job satisfaction[19,20]. However, despite these positive aspects, practical concerns such as technophobia and a lack of resources, along with educators' reluctance to change and lack of motivation, have proven to be significant barriers to the widespread adoption of e-learning [21].

The study provides information on dental educators' e-readiness based on reliable and valid tools. In addition, it gives a better insight into dental educators' e-readiness and provides a picture of how best to support them in the transition to e-learning. However, the findings of this study are limited to educators' opinions in six countries. The limitation of the sample size, study design, and self-reporting questionnaire implies inevitable biases, including selection, information bias, and social desirability.

Dental educators‘ readiness depends on institutional support, and the commitment at the institute level can increase e-readiness. Institutions should prepare and motivate educators to transition smoothly from traditional to e-learning education

CONCLUSION

Dental educators in the investigated institutions demonstrated confidence in their ability to adapt to e-learning. Nevertheless, institutional backing is vital to address resource limitations and amplify the impact of e-learning. Institutions should take initiative to equip and inspire educators, facilitating a seamless shift to e-learning.

Abbreviations: e-learning, electronic learning; OLRS, Online Learning Readiness Scale; SDL, Self-directed learning; MFL, Motivation for learning; CIS, Computer/internet self-efficacy; LC, Learner's control.

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Disclosure: The authors declare that they have no competing interests.

Author’s Contribution:

Concept & Design of Study:	Muhammad Adeel Ahmed, Hatim Mohammed Almahdi
Drafting:	Ramy Moustafa Moustafa Ali , Nazargi Mahabob
Data Analysis:	Rizwan Jouhar, Elwalid Fadul Nasir, Hatim Mohammed Almahdi
Revisiting Critically:	Muhammad Adeel Ahmed, Rizwan Jouhar
Final Approval of version:	By all above authors

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

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Original Article

To Determine the Frequency of Homocysteinemia in Patient with Acute Coronary Syndrome

Imran Khan Sandeelo, Naheeda Nisar, Faisal Ahmed, Mustafa Hussain Imam, Nouman Kakepoto and Mahfooz Ali Shah

ABSTRACT

Objective: To determine the frequency and factors associated with the ACS patients with homocysteinemia.
Study Design: Cross-sectional study design
Place and Duration of Study: This study was conducted at the Department of Cardiology, Liaquat National Hospital & Medical College, Karachi from 1st August 2018 to 31st January 2019.
Methods: All patient of age < 45 years presenting with chest pain were enrolled in the study. The patients were classified on the basis of ACS i.e. unstable angina, STEMI and NSTEMI. After confirming the diagnosis of ACS, homocysteine levels were assessed to confirm the diagnosis of elevated level of homocysteine (> 15µmol/l). Statistical analysis was done in SPSS version 26.
Results: In this study, 107 patients with acute coronary syndrome were included for the analysis patient 40.11+2.59 years. The mean age of patient was 40.11+2.59 years. Male preponderance was observed in our study. The most common type of ACS was unstable angina 54 (50.5%) followed by NSTEMI and STEMI. However, the frequency of homocysteinemia among patient with acute coronary syndrome was 26.2%.
Conclusion: In conclusion frequency of homocysyteinemia was 26.2%, common in males of particularly 31-44 years age group.

Key Words: Acute coronary syndrome, myocardial infarction, homocysteine, STEMI, NSTEMI

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INTRODUCTION

Acute coronary syndrome (ACS) is characterized by sudden blockage or reduction in the cardiac blood flow. This includes unstable angina (UA), non-ST elevated myocardial infarction (NSTEMI), and ST-elevated myocardial infarction (STEMI). Diagnosis and classification of ACS involve a comprehensive assessment of all the clinical features along with electrocardiogram (ECG), serology testing and echocardiography. ACS representing the acute form of ischemia and is a significant illness globally. The prevalence of ACS in Pakistan was found to be 36.9%.[1]. Traditional risk factors can only account for half of all causes of ACS.

Department of Cardiology, Liaquat National Hospital & Medical College, Karachi.

Correspondence: Dr. Imran Sandeelo, Department of Cardiology, Liaquat National Hospital & Medical College, Karachi.
Contact No: 03332608071, 03332608071
Email: imran_sandeelo@hotmail.com

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To understand the remaining causes, it is needed to explore novel and emerging risk factors. These include biological serological markers like elevated sensitive C-reactive protein, homocysteine, interleukin-6, serum uric acid levels.[2] Homocysteine is an amino acid resulting from the demethylation of methionine. Elevated homocysteine levels (above 15 mmol/L) have been linked to vascular diseases such as peripheral vascular disease, carotid artery stenosis, and coronary artery disease[3]. Homocystein is found to be directly toxic to the endothelial vascular cells and also in the stimulation of the smooth mucle cells of the vascular muscles, and it is also found to be associated with venous thromboembolism[4] A study by Mukherjee et al. reported the frequency of high homocysteine in 42.86% of patients with acute coronary syndrome. However, raised homocysteine (>40 years) as compared to the younger age group (54.55% vs. 23.08%).[7] However, raised homocysteine levels were found to be more prevalent in older age groups greater than 40 years (54.5%) as compared to the younger group (24.08% less than 40 years).

This study is aims to determine frequency of homocysteinemia acute syndrome (ACS) in age less than 45 years. Several studies have shown homocysteinemia in patients with ACS.[5,6] However, the evidence is still lacking in the Pakistani population. As we do not have our own local statistics, we should

know the true frequency, age at onset in our population, and common duration of ACS at the onset. So that early suspicion is made to avoid diagnostic delay and to do further research to identify risk factors so that they can be avoided in our population.

METHODS

This was a cross-sectional study design, and the data was collected from Liaquat National Hospital and Medical College (LNH & MC). All patients > 18 years of age presenting with ACS were included. Participants with a previous history of myocardial infarction or renal insufficiency were excluded from the study. Participation in the study was entirely voluntary, and every participant was clearly briefed about the informed consent that the collected data will only be used for research purposes and will be kept confidential. The sample size of our population was calculated using the WHO sampling calculator, using the anticipated frequency of homocysteinemia in patients with ACS 23.08[7], a margin of error of 8%, and a confidence level of 95%. The required sample size is 107.

Acute myocardial infarction (AMI) was diagnosed using the recently established definition set forth by the ACC/AHA/ESC/WHF task force [8]. Unstable angina is defined as unexpected chest pain and usually occurs while resting, having any one of the symptoms like onset at rest or minimum physical exertion lasting for more than 20 minutes if the nitroglycerine is not given, having a new onset within a month with more severity, and occurring with a crescendo pattern (brought on by minimal activity, more severe, more prolonged, or increased frequency than previously). STEMI is characterized by the features of MI symptoms (myocardial infraction), electrocardiographic changes like ST elevation, and elevated serum biomarkers of cardiac myocyte necrosis. positive troponin-I (>0.30 ng/dl) at the time of presentation and 6 hours later. NSTEMI is defined as unstable angina along with an abnormal cardiac enzyme, i.e., positive Troponin-I (> 3.0 ng/dl) and/or CKMB (>25ng/dl). Hypertension was defined as a known hypertensive person who has been on anti-hypertensive medication for more than 6 months, as assessed by history and clinically. Patients were diagnosed as diabetic of known diabetics (HbA1c > 6.5) who have been on anti-diabetics for more than 6 months, as assessed by history.

All statistical analysis was performed in SPSS version 26. All the descriptive statistics, including qualitative and quantitative, are presented in tabular form. Quantitative variables are reported as mean and standard deviation. While qualitative variables such as gender, comorbidity (diabetes and hypertension), type of acute coronary syndrome, and homocysteinemia were reported in frequency (n) and percentage (%), For inferential statistics, chi-square tests were applied among the variables to determine any association. All P-values less than or equal to 0.05 will be considered statistically significant.

RESULTS

A total of 107 diagnosed patients with ACS were included in the study. The mean age of the patients is 40.11 + 2.59 years. Among the 107 patients, the majority were male, 87 (81.3%). The mean duration of the final diagnosis of ACS was 7.67 + 1.681 hours (Table 1).

Table No. 1: Represents the demographic data of the participants in frequency and percentages.

Demographic data		Frequency (%)
Age (mean ± SD)		40.11+2.59 years
Gender	Male	87 (81.3)
	Female	20 (18.69)
Diabetes	Yes	33 (30.8)
	No	74 (69.2)
Hypertension	Yes	49 (45.8)
	No	58 (54.2)
Unstable Angina		54 (50.5)
STEMI		18 (16.8)
NSTEMI		35 (32.7)

In our study, 49 (45.8%) patients were hypertensive, and 33 (30.8%) had diabetes. However, the most common type of ACS was unstable angina (50.5%), followed by NSTEMI (27.7%), and STEMI (20.0%) (shown in Table 1). Furthermore, homocysteinemia among patients with ACS was observed in 28 (26.2%) (Figure 1).

Table 2 shows the comparison of homocysteinemia with baseline characteristics such as comorbidity and ACS type. There is no significant association between homocysteinemia and baseline In comparison to the sociodemographic information (age, gender, p = 0.486), complications (diabetes, p = 0.862, hypertension, p = 0.421), time duration since diagnosis of ACS (p = 0.680), and type of ACS (p = 0.592), there was no statistically significant association found.

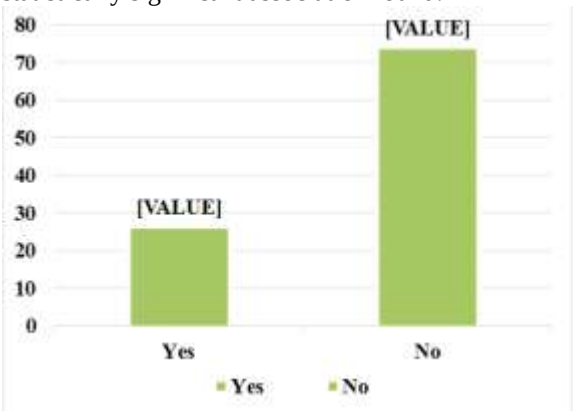

Figure No.1: Distribution of homocysteinemia among study population

Table No.2: Association of Homocysteinemia with demographic data of the patients

Independent Variables		Homocysteinemia		Total	P Value
		Yes	No		
Age (Years)	18-30	--	--	--	--
	31-44	28(26.16%)	79(73.83%)	107(100%)	
Gender	Male	24(27.5%)	63(72.41%)	87(100%)	0.486
	Female	4(20.0%)	16(80.0%)	20(100%)	
Duration of ACS diagnosis (hours)	9-June	23(27.05%)	62(72.94%)	85(100%)	0.68
	12-October	5(22.72%)	17(77.27%)	22(100%)	
Diabetes	Yes	9(27.27%)	24(72.72%)	33(100%)	0.862
	No	19(25.67%)	55(74.32%)	74(100%)	
Hypertension	Yes	11(22.44%)	38(77.55%)	49(100%)	0.421
	No	17(29.31%)	41(70.68%)	58(100%)	
Type of ACS	Unstable angina	16(36.36%)	38(86.36%)	44(100%)	0.592
	STEMI	5(27.77%)	13(72.22%)	18(100%)	
	NSTEMI	7(20.0%)	28(80.0%)	35(100%)	

DISCUSSION

Globally, CVD is one of the leading causes of morality, morbidity and in Pakistan aswell. At national level of Pakistan it lacks updated information reflecting the actual prevalence and incidence of acute coronary syndrome, despite having a high burden of CVS diseases. Recent research has reported the increase in aggressive conditions even in younger ages[9]. Homocysteine is a sulfur radical containing an amino acid, which is an intermediate metabolic byproduct of cysteine metabolism and is derived from methionine, an essential amino acid found in dietary proteins. In our study, the majority of patients were aged 31–44 years, as compared to the Mukherjee et al[7] study, in which the majority (64%) lies in the 35–45 age group, whereas in contrast to previous reported data, which shows the majority of cases reported after 50 years of age, the CREATE study[10].

In our study frequency of homocysteine was 26.2% as compare to Mukherjee et al[7] study which shows elevated homocysteine level 42.86%. It has been observed that elevated homocysteine levels are more prevalent in individuals aged over 40 (54.55%) compared to those under 40 (23.08%). This statistically significant data indicates that homocystein could serve as of the screening methord for individuals with ACS over the age of 40 years, regardless of gender[11]. The most suitable treatment for individuals falling in this age group including cobalamin (vitamin B-12) and Folic acid (vitamin B-9). Interestingly, males generally exhibit higher homocysteine levels than females, although this difference is not statistically significant. This lack of significance could be attributed to the overall higher number of males in the study. However, among females, groups tend to occurrences elevated levels. However in female which are not in there fertility period (peri and post-menopausal period) reported to have higher level of homocysteine level. Such facts highlight the importance of homocysteine level in the development of CVSD. People with homocystinuria, an inherited disorder who are found to have high levels of homocystein in their blood were reported to have early atherosclerosis and thromboembolic complications[7,12]. It is believed that homocysteine is a possible contributor to the oxidation of LDL and the growth of smooth muscle cells located in the tunica media of the vessel wall. It is also an activator of coagulation factors, and platelets also cause endothelial dysfunction.

Some medical experts have recommended maintaining the homocystein level below 10 µmol/L, especially in high-risk CVSD patients, as a therapeutic goal[13]. Studies were done to compare homocystein levels in patients with and without coronary artery diseases and revealed that patients with CAD had statistically significant elevated plasma homocystein levels as compared to those with no CAD, with risk ratios ranging from 1.2 to 10.9 after adjusting for other risk factors[14,15]. Despite our study, we didn't identify any significant association between homocysteinemia and ACS. This warrants further research to relate pathophysiology to the underlying mechanisms. Additionally, the role of other possible factors, such as genetics and multimorbidity, should be studied with different study designs.

There are certain limitations to this study. Firstly, there was firstly, more studies should be done with a large sample size. Secondly, the involvement of different departments of medicine to study all possible effects of homocysteine in a more synchronized manner. Larger cohorts are needed to establish a causal relationship among the variables.

CONCLUSION

The frequency of homocysyteinemia was 26.2% among the patients with ACS, found to be most common in males between the ages of 31 and 44.

Author's Contribution:

Concept & Design of Study:	Imran Khan Sandeelo, Naheeda Nisar
Drafting:	Faisal Ahmed, Mustafa Hussain Imam
Data Analysis:	Nouman Kakepoto 6. Mahfooz Ali Shah
Revisiting Critically:	Imran Khan Sandeelo, Naheeda Nisar
Final Approval of version:	By all above authors

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Original Article

Comparison of Common Postoperative Complications Between Lichtenstein Open Repair and Laproscopic Transabdominal Pre-Peritoneal (TAPP) Repair in Inguinal Hernia

Anam Batool[1], Hafsa Rauf[2], Warda Khalid[2], Muhammad Umair Samee[2], Mudassar Murtaza[2] and Amer Mian[2]

ABSTRACT

Objective: To evaluate the common postoperative complications of Lichtenstein mesh repair and laparoscopic TAPP repair in patients with inguinal hernias.

Study Design: Randomized controlled trial study

Place and Duration of Study: This study at the Department of Surgery, Central Park Teaching Hospital, Lahore from January 2023 to June 2023.

Methods: This comparative study was conducted at Central Park Hospital, Lahore. A total of 100 participants were divided into two groups after taking informed consent. Data was entered and analyzed by SPSS 26.

Results: The average age of the cases in Group A was 23.70 ± 5.08 and in Group B it was 25.86 ± 4.44. In this study hematoma formation, secrotal edema urinary retention and chronic pain was found significant in both groups with p-value 0.041, 0.022, 0.025 and 0.022 respectively. However, seroma formation, and hernia recurrence was found insignificant with p-values 0.079, and 0.092 respectively.

Conclusion: It is concluded that both ways are good for surgery but TAPP is safer, cheaper and time saving with the lesser incidence of post-operative complications and decreased rate of infection.

Key Words: Laparoscopic inguinal hernia, TAPP repair, Lichtenstein repair

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INTRODUCTION

A hernia is a condition in which a viscus or a portion of a viscus protrudes through the wall of the cavity in which it is typically situated. Intra-abdominal cancer, obesity, coughing, and exertion are all risk factors for hernia[1]. The abdomen, femur, umbilical cord, and inguinal area are among the anatomical locations in which hernias can develop. The most prevalent form of hernia is inguinal hernias, which account for approximately 73% of all cases[2].

[1.] Department of General Surgery / Surgery, Central Park Teaching Hospital, Lahore.

Correspondence: Dr. Anam Batool, Postgraduate Resident, Department General Surgery, Central Park Teaching Hospital, Lahore.
Contact No: 03044900023
Email: khan.batool2376@gmail.com

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An inguinal hernia (IH) is treated using a variety of surgical approaches. In the United States, approximately 700,000 hernia repairs are performed annually, with mesh repair being one of the most frequently conducted operations[3]. Nevertheless, the repair of Lichtenstein mesh is linked to an elevated risk of postoperative distress, urine retention, and the formation of hematomas. The postoperative complications have been significantly improved as a consequence of recent advancements in surgical treatments. Postoperative pain and hospital stay have been demonstrated to be reduced by minimally invasive treatments, including laparoscopic TAPP, intraperitoneal only mesh (IPOM) repair, and completely extraperitoneal (TEP)[4,5].

The objective of this investigation was to evaluate the postoperative complications of Lichtenstein mesh repair (LMR) and laparoscopic TAPP repair in patients with unilateral IH. The meta-analysis conducted by Wright et al. did not reveal any significant differences between the two procedures. On the other hand, Stoppa et al. argued that laparoscopic hernia repair (LHR) produced better outcomes in terms of less post surgical pain and a quicker return to normal physical activity. [6-8].

METHODS

This was a comparative investigation conducted at Central Park Teaching Hospital in Lahore from January 2023 to June 2023.. After fulfilling inclusion criteria a total of 100 patients were randomly allocated into two equal groups (n=50 each) by simple random sampling. This study was conducted the guidelines of Hilinski declaration after getting ethical approval (CPMC/IRB-No/1383A) from institutional review board of Central Park Medical College and Teaching Hospital Lahore. In this study, patients aged 18 to 70 who had a unilateral IH and undergoing elective surgery were eligible and recruited while the patients who had bilateral inguinal hernias, systemic/local infections, and a history of pelvic surgery were excluded from this study.

Following permission from the hospital's ethics council, patients who met the inclusion requirements were randomly assigned using a computer program. All patients provided informed written permission. Prior to the procedure, an anaesthetic assessment was performed. All of the operations were carried out by the same group of surgeons who had over two years of experience doing open and laparoscopic hernia surgeries. A predesigned performa was used to record demographic and clinical characteristics (e.g., age, gender, length of hospital stay), as well as complications after surgery.

Statistical Analysis: The data was analyzed with SPSS version 26. Quantitative factors (age, length of hospital stay) were represented as mean ± SD, while qualitative variables (gender, post-operative issues) were described as frequencies and percentages. The chi-square test was performed to compare post-operative results. A p-value of <0.05 was considered significant.

RESULTS

RESULTS

The average age of the cases in Group A was 23.70 ± 5.08 and in Group B it was 25.86 ± 4.44. A total of 50 (100%) male were enrolled in both groups. The mean length of hospital stay was 1.20 ± 0.40 in Group A and 2.14 ± 0.90 in Group B. (Table 1)

Table No. 1: Demographics and clinical parameters

		Lichtenstein (Group A)	TAPP (Group B)
Age (Mean ± S.D)		23.70 ± 5.08	25.86 ± 4.44
Gender	Male	50 (100%)	50 (100%)
Length of hospital Stay (Mean ± S.D)		1.20 ± 0.40	2.14 ± 0.90

In this study hematoma formation, secrotal edema urinary retention and chronic pain was found significant in both groups with p-value 0.041, 0.022, 0.025 and 0.022 respectively. However, seroma formation, and hernia recurrence was found insignificant with p-values 0.079, and 0.092 respectively (Table 2).

Table No. 2: Comparison of Post-operative Complications

		Lichtenstein (Group A)	TAPP (Group B)	P-Value
Hematoma Formation	Yes	4 (8%)	0 (0%)	0.041
	No	46 (92%)	50 (100%)	
Seroma Formation	Yes	3 (6%)	0 (0%)	0.079
	No	47 (94%)	50 (100%)	
Secrotal Edema	Yes	5 (10%)	0 (0%)	0.022
	No	45 (90%)	50 (100%)	
Urinary Retention	Yes	9 (18%)	2 (4%)	0.025
	No	41 (82%)	48 (96%)	
Hernia Recurrence	Yes	5 (10%)	1 (2%)	0.092
	No	45 (90%)	49 (98%)	
Chronic Pain	Yes	5 (10%)	0 (0%)	0.022

DISCUSSION

Reducing the contents, ligating the sac, and using mesh reinforcement to strengthen the posterior abdominal wall constitute the fundamental principles of IH repair. In the past, the most frequently performed operation was the repair of an open IH. However, the development of minimally invasive techniques was necessitated by the delayed return to daily activities and the increased postoperative discomfort. Laparoscopic TAPP repair was considered the safest alternative.

The initial laparoscopic repair of an IH was conducted in the 1990s[5,9]. LHR has several advantages, including lower postoperative discomfort, fewer postoperative problems, shorter hospital stays, and a shorter time of disability[10,11]. TAPP repair reduces postoperative pain because it has a lower rate of postoperative complications, which are strongly related[12-14].

The study initially comprised 100 individuals with unilateral inguinal hernias. The average age of cases in Group A was 23.70 ± 5.08, while in Group B it was 25.86 ± 4.44. Similarly findings were noticed in a previous study in which all patients were male, as is typical in our demographic.

In our investigation, hematoma formation, secrotal edoema, urine retention, and persistent discomfort were all significant in both groups (p-values 0.041, 0.022, 0.025, and 0.022, respectively). However, seroma formation and hernia recurrence were shown to be negligible (p-values = 0.079 and 0.092, respectively). In a previous study, Group I experienced a higher

percentage of postoperative complications (32%) than Group II (4%). These included the development of hematoma and seroma, scrotal edoema, and urinary retention. Inguinal incision is linked to these complications. Consequently, they are more probable to manifest during the open method than the laparoscopic technique [15]. 0% to 4% has been reported as the recurrence rates following LHR[12]. Wijerathne et al.[12] highlighted that complications and post-operative pain are highly connected. Furthermore, less post-operative pain could be linked to fewer problems connected with this method.

The incidence of chronic pain was zero in TAPP and 10% in LMR in our study. As previously reported in investigations[10,16], persistent pain was significantly more prevalent in LMR in another study. The primary explanation may be the mesh's distinct allocation of space in comparison to the open approach. Nevertheless, this necessitates further investigation. Hematoma and seroma development are also regarded as risk factors for long-term suffering following inguinal hernia treatment[15,17].According to Wennergren et al.[15], laparoscopic IH repair reduces early postoperative pain more than open Lichtenstein repair.

CONCLUSION

It is concluded that both ways are good for surgery but TAPP is safer, cheaper and time saving with the lesser incidence of post-operative complications and decreased rate of infection, however, a lager study is warranted to assess the generalizability but TAPP should be recommended and advised for the patients of hernia repair.

Author's Contribution:

Concept & Design of Study:	Anam Batool
Drafting:	Hafsa Rauf, Warda Khalid
Data Analysis:	Muhammad Umair Samee, Mudassar Murtaza, Amer Mian
Revisiting Critically:	Anam Batool, Hafsa Rauf
Final Approval of version:	By all above authors

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Original Article

A Comparative Study of Post-Operative Pain at Port-Site After Gallbladder Retrieval From Umbilical Ports Versus Epigastric Ports in Laparoscopic Cholecystectomy

Laparoscopic Cholecystectomy via Umbilical and Epigastric Ports after Gallbladder Removal

Hafsa Rauf[1], Warda Khalid[1], Anam Batool[2], Mudassar Murtaza[1], Amer Mian[1] and Mishal Shahid[3]

ABSTRACT

Objective: To evaluate the difference in the results of laparoscopic cholecystectomy performed via umbilical and epigastric ports after gallbladder removal.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the department of Surgery, Central Park Teaching Hospital, Lahore from January 2023 to June 2023.

Methods: Data collection: 100 patients; 50 in each group fulfilling selection criteria were enrolled for the study and were randomly divided in two groups. Time taken for retrieval of gallbladder, post-operative pain, bleeding, complete wound healing, re-operation were noted during follow-up. SPSS v. 25 was used to analyse the data.

Results: Mean age of the patients in umbilical port group was 44.96 ± 16.63 years and in gastric port group was 43.40 ± 15.21 years. In umbilical port group, the mean time for retrieval of gall bladder was observed as 3.96 ± 0.83 minutes and in gastric port group was 5.80 ± 1.20 minutes ($p < 0.001$). In umbilical port group, the mean pain score after 24 hours was 3.20 ± 0.89 and in gastric port group was 4.74 ± 1.16 ($p < 0.001$).

Conclusion: Umbilical port gall bladder retrieval is preferable to gastric port because it requires less time in surgery, causes less discomfort, and has a higher rate of success.

Key Words: post-operative pain, port-site, gallbladder retrieval, umbilical ports, epigastric ports, laparoscopic cholecystectomy

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INTRODUCTION

Laparoscopic cholecystectomy is a minimally invasive surgical method used to remove the gallbladder.[1] Acute and chronic inflammation of the gallbladder, symptomatic presence of gallstones, abnormal gallbladder movement, inflammation of the gallbladder without the presence of gallstones, inflammation of the pancreas caused by gallstones, and abnormal growths in the gallbladder are all indications for considering a laparoscopic removal of the gallbladder. It is recommended to do an open cholecystectomy for the same reasons.[2]

Open cholecystectomy is generally the most efficacious approach for treating gallbladder cancer in the majority of cases. Approximately 20% of the population in the United States is affected by gallstones. Approximately 300,000 individuals get cholecystectomies annually.[3] Approximately 10% to 15% of the population is affected by gallstones without experiencing any symptoms. Twenty percent of these instances manifest symptoms, specifically biliary colic. Complications, such as acute cholecystitis, gallstone pancreatitis, choledocholithiasis, and gallstone ileus, afflict between 1% to 4% of the 20% of patients who experience symptoms.[4] The incidence of gallstones is higher in the senior population, with a higher likelihood of occurrence in females compared to males. The primary constituents of gallstones are predominantly cholesterol (about 75%) and pigments (25%). Gallstones, regardless of their composition, exhibit identical clinical signs.[1-4]

[1.] Department of Surgery General Surgery[2], Central Park Teaching Hospital Lahore.
[3.] Department of Surgery, Pak Red Cresent Medical and Dental College, Lahore.

Correspondence: Dr. Hafsa Rauf, Postgraduate Resident, Department General Surgery, Central Park Teaching Hospital, Lahore.
Contact No: 03331547879
Email: hafsarauf93@gmail.com

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After a laparoscopic cholecystectomy, it is common for patients to have increased discomfort and infection at the incision site since the gallbladder must be removed before the incision can be closed. Perforation of the gallbladder wall and leakage of bile in wound might derail an otherwise routine cholecystectomy.[5, 6] There is insufficient data to make a well-informed decision on where to make the incision for gallbladder removal.[7] Thus, this research was designed to be conducted in a local context in order to gather evidence supporting a more suitable technique for gall bladder retrieval, with the aim of replacing the less efficient or sluggish methods now employed in ordinary practice.

METHODS

A cross-sectional study was conducted at department of surgery, Central Park Teaching Hospital, Lahore from January 2023 to June 2023 with the objective of comparison of post operative pain in gall bladder retrieval from umbilical and epigastric ports after approval of institution review board (CPMC/IRB-No/1382A) of Central Park Medical College. Sample size (n_x) of 100 patients; 50 in both groups was estimated by keeping the 95% confidence level, 90% power of study and mean pain score after 1 hour was 5.500±1.176 with umbilical port and 6.640±1.494 with gastric port.[8] Patients aged between 20-70 years, both gender diagnosed with cholelithiasis were enrolled in the study. Gallbladder malignancy, bleeding diatheses, prior abdominal drain installation, obstructive jaundice, acute pancreatitis, and prior port-site extension were all reasons to exclude a patient from the study.

One hundred patients who met the specified criteria were enrolled from the wards of the Department of Surgery. Explicit consent was acquired from all the patients. The demographic information of each patient, such as their name, age, gender, BMI, duration of cholelithiasis, duration of stone size, hypertension, smoking, diabetes, and ASA, was recorded. The patients were randomly allocated into two equal groups using a random number table. In group A, gall bladder was retrieved through umbilical port after removing gall bladder stone. In group B, gall bladder was retrieved through gastric port after removing gall bladder stone. Patients with standard elective four port laparoscopic cholecystectomy for benign gall bladder diseases (symptomatic gallstones, gall bladder polyps) were underwent surgery. The procedures were performed under general anaesthesia by a single surgical team, with the help of a researcher. Intraoperatively, time for gall bladder retrieval and bleeding were noted. Then patients will be shifted to post-surgical wards and were followed-up for 72 hours.

Statistical Analysis: SPSS version 25.0 was used for entry of data and analysis. Both groups were compared for mean pain score by using independent samples t-test and for efficacy by using chi-square test. P-value ≤ 0.05 as significant.

RESULTS

In this study, we enrolled a total of 100 patients and randomly assigned them to two equal groups. Average age of the patients in umbilical port group was 44.96 ± 16.63 years, while average age of the patients in stomach port group was 43.40 ± 15.21 years. The umbilical port group consisted of 29 men (58.0%) and 21 females (42.0%) while in the gastric port group consisted of 17 men (34.0%) and 33 females (66.0%). The average BMI of patients in the umbilical port group was 31.05 ± 5.03 kg/m2. The average BMI of patients in the gastric port group was 29.96 ± 4.74 kg/m^2. In umbilical port group, about 24 (48.0%) patients had ASA I and 26 (52.0%) patients had ASA II. In gastric port group, about 28 (56.0%) patients had ASA I and 22 (44.0%) patients had ASA II.

Table No. 1: Baseline characteristics of enrolled patients in both port groups

	Group	
	Umbilical port	**Gastric port**
n	50	50
Age (years)	44.96 ± 16.63	43.40 ± 15.21
Gender		
Male	29 (58.0%)	17 (34.0%)
Female	21 (42.0%)	33 (66.0%)
BMI (kg/m^2)	31.05 ± 5.03	29.96 ± 4.74
ASA		
I	24 (48.0%)	28 (56.0%)
II	26 (52.0%)	22 (44.0%)
Duration of symptoms (months)	17.02 ± 9.66	18.22 ± 9.62
Stone size (mm)	5.76 ± 2.73	5.42 ± 2.89
Hypertension		
Yes	28 (56.0%)	25 (50.0%)
No	22 (44.0%)	25 (50.0%)
Diabetes		
Yes	27 (54.0%)	22 (44.0%)
No	23 (46.0%)	28 (56.0%)
Smoking		
Yes	19 (38.0%)	14 (28.0%)
No	31 (62.0%)	36 (72.0%)

The mean duration of gall stone disease was 17.02 ± 9.66 months in patients in umbilical port group and 18.22 ± 9.62 months in gastric port group. The mean size of stone was 5.76 ± 2.73 mm in patients in umbilical port group and 5.42 ± 2.89 mm in gastric port group. In the umbilical port group, 28 individuals (56.0%) had a positive history of hypertension, while 22 individuals (44.0%) were normotensive. In the gastric port group, 25 individuals (50.0%) were

hypertensive, while the remaining 25 individuals (50.0%) were normotensive. Within the umbilical port group, 27 individuals (54.0%) had a positive history of diabetes, while 23 individuals (46.0%) did not have diabetes. Among the gastric port group, 22 individuals (44.0%) had a positive history of diabetes, while 28 individuals (56.0%) did not have diabetes. In the umbilical port group, 19 individuals (38.0%) had a positive history of smoking, while 31 individuals (62.0%) were non-smokers. In the gastric port group, 14 individuals (28.0%) had a positive history of smoking, while 36 individuals (72.0%) were non-smokers. Table – 1.

Table No. 2: Comparison of the surgical outcomes in both port groups

Outcome	Group		Significance level
	Umbilical port	Gastric port	
Time to retrieve gall bladder (min)	3.96 ± 0.83	5.80 ± 1.20	<0.0001
Pain after 1 hour	5.68 ± 1.15	6.72 ± 1.05	<0.0001
Pain after 6 hours	4.08 ± 0.83	5.32 ± 1.08	<0.0001
Pain after 12 hours	3.80 ± 0.83	5.42 ± 1.16	<0.0001
Pain after 24 hours	3.20 ± 0.89	4.74 ± 1.16	<0.0001
Need for re-exploration			0.046
Yes	2 (4.0%)	8 (16.0%)	
No	48 (96.0%)	42 (84.0%)	
Post-surgical infection			0.027
Yes	1 (2.0%)	7 (14.0%)	
No	49 (98.0%)	43 (86.0%)	
Hospital stay after surgery (days)	3.04 ± 0.81	3.98 ± 0.82	<0.0001

In umbilical port group, the mean time for retrieval of gall bladder was observed as 3.96 ± 0.83 minutes. In gastric port group, the mean time for retrieval of gall bladder was observed as 5.80 ± 1.20 minutes ($p < 0.001$). In umbilical port group, the mean pain score after 1-hour was 5.68 ± 1.15. In gastric port group, the mean pain score after 1-hour was 6.72 ± 1.05 ($p < 0.001$). In umbilical port group, the mean pain score after 6-hours was 4.08 ± 0.83. In gastric port group, the mean pain score after 6-hours was 5.32 ± 1.08 ($p < 0.0001$). In umbilical port group, the mean pain score after 12-hours was 3.80 ± 0.83. In gastric port group, the mean pain score after 12-hours was 5.42 ± 1.16 ($p < 0.001$). In umbilical port group, the mean pain score after 24 hours was 3.20 ± 0.89. In gastric port group, the mean pain score after 24 hours was 4.74 ± 1.16 ($p < 0.001$). In the group of patients with an umbilical port, re-exploration was required in 2 patients (4.0%). In the group with a stomach port, re-exploration was needed in 8 patients (16.0%) that was significant ($p < 0.05$). Among the patients in the umbilical port group, there was an infection in 1 instance, which represents a rate of 2.0%. In the stomach port group, 7 patients (14.0%) experienced post-surgical infection. The difference between the two groups was statistically significant, with a p-value of less than 0.05. The average duration of hospitalisation following surgery in the umbilical port group was 3.04 ± 0.81 days. The average duration of hospitalisation after surgery in the gastric port group was 3.98 ± 0.82 days ($p < 0.001$). Table – 2.

DISCUSSION

The most effective therapy for gallstone symptoms is laparoscopic cholecystectomy. The most common side effect reported by patients after laparoscopic cholecystectomy is pain. After a laparoscopic cholecystectomy, incisional discomfort is more prominent than visceral pain during the first 48 hours.[9, 10] In umbilical port group, the mean time for retrieval of gall bladder was observed as 3.96 ± 0.83 minutes. In gastric port group, the mean time for retrieval of gall bladder was observed as 5.80 ± 1.20 minutes ($p < 0.001$). In umbilical port group, the mean pain score after 24 hours was 3.20 ± 0.89.

Hajong et al., found that when comparing the pain scores at 1 h after surgery, those at the epigastric port were significantly higher than those at the umbilical port were (6.640 ± 1.494 vs. 5.500 ± 1.176), after 6 h was (6.620 ± 1.549 vs. 5.320 ± 1.188), after 12 h was (6.100 ± 1.549 vs. 4.660 ± 1.232), and after 24 h was (5.250 ± 1.459 vs. 3.970 ± 1.274). However, in the umbilical group, gall bladder removal took much longer (4.94 1.56 vs. 3.24 1.29).[8] However, Bashir et al. showed that there was no significant difference in postoperative pain scores at 24 hours between the two groups (p value > 0.05), despite the fact that they included 94 patients and noted a significant difference in mean time for gall bladder retrieve (p value = 0.032). It was determined that there is no discernible difference between the two ports.[11]

In a similar study, Jain et al. found that patients reported significantly less pain at the umbilical port than they did at the epigastric port simultaneously ($p<0.05$): mean pain scores at the umbilical port were 5.20 + 0.86, 4.60 + 0.74, 4.00 + 0.53, 3.40 + 0.08, and 2.73 + 0.82, respectively, across all time intervals. [12]

We performed a thorough systematic review and meta-analysis of comparative trials since there is debate about which port location is best for gallbladder extraction after laparoscopic cholecystectomy. We found that 2,394 patients had laparoscopic cholecystectomy with gallbladder extraction via umbilical (n= 1194) or epigastric (n= 1200) port in five randomized trials and one prospective cohort research. There was a moderate decrease in discomfort after 24 hours after gallbladder removal via umbilical port and epigastric port ($p>0.05$). However, after doing a sensitivity analysis in which the most influential source of variability was taken out of the equation, the VAS decrease after 24 hours became statistically significant.[13-16]

The results suggest that using a metallic-dilator, aggressively stretching the muscles & sheath, and breaking the skin are all linked with an increased risk of complications. Contrarily, umbilical port is often put by an open approach, resulting in a comparatively broader port-site that makes gallbladder removal easier by requiring less patient bending. In first 48-hours of laparoscopic procedure, the incisional pain that is reason of 70% of discomfort, has been observed to be more prominent than visceral pain. Consequently, it may be possible to have less discomfort immediately after a laparoscopic cholecystectomy if the gallbladder is retrieved with as little tissue stress as possible.[16, 17]

In our study, infection occurred in 1 (2.0%) case in umbilical port group, while in gastric port group, 7 (14.0%) patients had post-surgical infection (p-value < 0.05). The infection rate among the umbilical and epigastric groups was similarly low. The follow-up time in the included studies is not long enough to reliably evaluate the outcome of port-site hernia. When the gallbladder is removed laparoscopically, there is a greater chance of bile leakage, stone implantation, and port-site infection. This is especially problematic for the epigastric port since infection there is notoriously difficult to eradicate. Some suggest that the risk of a challenging epigastric port-site infection may be mitigated by switching positions and passing the laparoscope camera via the umbilical port during gallbladder removal when using the umbilical port.[11, 18, 19]

CONCLUSION

Umbilical port gall bladder retrieval is linked with shorter operation times, less discomfort, and higher success rates than stomach port gall bladder retrieval. In the future, we may utilize the umbilical port instead of the stomach port to remove the gall bladder, which will result in faster patient recovery and a higher quality of life.

Author's Contribution:

Concept & Design of Study:	Hafsa Rauf
Drafting:	Warda Khalid, Mudassar Murtaza, Anam Batool
Data Analysis:	Amer Mian, Mishal Shahid
Revisiting Critically:	Hafsa Rauf, Warda Khalid
Final Approval of version:	By all above authors

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Original Article

Defining Prostate-Specific Antigen (PSA) Threshold Level for Prediction of Advanced Prostate Cancer in a Subset of Karachi (Pakistan) Population

Zehra Abidi[1], Nuzhat Hassan[1], Faraz Ahmed Baig[2] and Inayatullah Khan[1]

ABSTRACT

Objective: The primary goal of this study is to determine the diagnostic potential of PSA levels in prostate cancer, the histopathological pattern of aggression in terms of the Gleason grading system, and bone metastasis in a subset of the Karachi population.

Study Design: Comparative cross-sectional study.

Place and Duration of Study: This study was conducted at the Ziauddin University, Karachi on 126 prostate biopsy specimens from a subset of the Karachi population from February 2023 to January 2024.

Methods: The samples were recruited after the histopathological confirmation and were composed of 68 prostate adenocarcinoma (PCA) and 58 benign prostatic hyperplasia (BPH) along with the clinic-pathological data. Quantitative analysis of PSA and Gleason scores was done. The area under the receiver operating characteristic curve (AuROC) was generated to determine the sensitivity, specificity, positive predictive value, negative predictive value, positive likelihood ratio, negative likelihood ratio, and diagnostic accuracy of PSA level was evaluated for diagnostic performance with positive biopsy. One-way ANOVA was applied among different grades of PCA.

Results: The PSA levels showed higher sensitivity (AuROC=0.999) for the diagnosis of PCA and good performance in determining tumoral grade and the possibility of distant metastasis. We found that PSA levels higher than 7.055 could be a threshold value for predicting PCA in suspected biopsy.

Conclusion: The data showed that PSA can predict PCA, Gleason grade, and bone metastasis. In addition to that, we were able to document a threshold point to suspect PCA during the early pathological course.

Key Words: PCA (prostate adenocarcinoma), BPH (benign prostatic hyperplasia), AUROC (area under receiver operating curve), PSA (prostate-specific antigen).

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INTRODUCTION

The second most common malignant tumor in older men is PCA[(1)]. Asia has seen an increase in PCA cases in recent decades[(2)]. Presently, Digital rectal examination (DRE) abnormalities and increased PSA levels are the basis for prostate cancer screening[(3)]. Although, when used together, PSA and DRE showed greater performance in the early onset of PCA, both investigations failed to achieve the definitive diagnostic value[(4)].

[1.] Department of Anatomy / Pathology, Ziauddin University, Karachi.

Correspondence: Dr. Zehra Abidi, Department of Anatomy, Ziauddin University, Karachi.
Contact No: 03312273704
Email: zehra.12526@zu.edu.pk, posshu@gmail.com

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Higher sensitivity and low specificity of PSA are the biggest challenges in the clinical diagnosis of PCA[(5)]. As a consequence, higher false positive rates were reported, contributed by increased prostate volume commonly observed in benign conditions and factors such as infection[(6).] Despite that, elevated PSA levels still serve as a primary method of screening for PCA as novel biomarkers are currently unavailable[(7)].

The widely accepted cutoff for the serum PSA level is 4ng/ml which underlines 35 to 43% of cases diagnosed accurately[(8)]. Unfortunately, this cut-off value is more applicable to the Western population while no cutoff is available for the Pakistani population, which is genetically distinct. Additionally, elevated PSA levels may also reflect a greater likelihood of higher Gleason score and advanced disease[(9)]. We, therefore, studied the effectiveness of PSA levels for diagnosis and aggressiveness of PCA in routine clinical practice.

METHODS

This comparative cross-sectional study was performed at the multidisciplinary lab of Ziauddin University

Clifton campus, Karachi. The samples were retrieved from The Laboratory Sadder Karachi, Pakistan, after the ethical approval of the Ethics Review Committee of Ziauddin Hospital Karachi, Pakistan. (Reference code: 6360123ZAANA).

Data from 126 prostate biopsy specimens were collected by convenient sampling technique, which was recently diagnosed with PCA (n=68) and BPH (n=58). All patients were receiving primary care at different tertiary care hospitals in Pakistan. Any secondary pathology of the prostate by local invasion and poorly fixed tissues was excluded. The patient's demographic and pathological data were retrieved from biopsy reports following diagnosis, including specimen number, age, hospital, diagnosis, histopathological report, and history of bone metastasis. PSA levels were also collected.

Statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 24. Age, PSA levels, and Gleason score were represented by mean ±S.D. Gleason Grade and Bone metastasis were represented by frequency and percentage. ROC was plotted to assess the diagnostic performance of PSA levels. By using Youden's index method, the best cut-off value of PSA level was assessed to diagnose PCA.

By using this cut-off value of PSA, the sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were also assessed. Gleason Grading and bone metastasis were also evaluated. One-way ANOVA was applied among PSA levels and different Gleason grade groups to compare the PSA levels among them. P-value ≤ 0.05 was considered statistically significant.

RESULTS

The clinical data of PCA (n=68) revealed that the mean age was 69.62±7.79 years while the average PSA level was 24.11±15.58 ng/ml. Similarly, BPH (n=58) showed the mean PSA and age of 4.12±1.71 ng /ml and 66.48±7.87 respectively. The other clinical variables showed an overwhelming majority of high-grade tumors (Gleason score >8) in the PCA group whereas the mean for the Gleason score was observed to be 7.32±0.8. Metastasis (bone) was reported in 15/68 cases of PCA (Table 1)

The plots for serum PSA showed higher levels in subjects of PCA with increased Gleason score and bone metastasis (Figures 1 and 2). These results were also in agreement with the area under the ROC reflecting an overall diagnostic predictability (0.99) for PCA, however, these values were (0.97) and (0.76) for Gleason score and bone metastasis respectively (Table 2). We found that the chances of diagnosing PCA were much higher than that of BPH when the PSA level was beyond the threshold point of 7.055 ng/ml. Overall, at this threshold point, the positive predictive value was 97.14% and the negative predictive value was 100%. Lastly, the recorded sensitivity and specificity of PSA for diagnosis of PCA were noted to be 100% and 96.5% respectively along with a diagnostic accuracy of 98.41% (Table 2).

PSA levels were compared among 5 different Gleason grades and statistically significant results were found at P-value < 0.001 by applying one-way ANOVA. Post hoc analysis among the multiple comparison of groups revealed statistically significant results for PSA levels as shown in (Table 3) grade 1 and grade 4 (P-value < 0.001), grade 1 and grade 5 (P-value < 0.001), grade 2 and grade 4 (P-value <0.001), grade 2 and grade 5 (P-value <0.001), grade 3 and grade 4 (P-value <0.001), grade 3 and grade 5 (P-value <0.001) and grade 4 and grade 5 (P-value <0.001).

Table No. 1: Descriptive Analysis:

VARIABLES	MEAN ± S.D / FREQUENCY (%)
AGE	68.17±7.95 years
PCA cases (n=68)	69.62 ± 7.79 years
BPH cases (n=58)	66.48 ± 7.87 years
PSA LEVELS	
Overall	14.91±15.22 ng/ml
PCA(n=68)	24.11 ± 15.5 ng/ml
BPH(n=58)	4.12 ± 1.71 ng/ml
Frequency of PCA Grades	
Grade 1(n=5)	7.4%
Grade 2 (n=18)	26.5%
Grade 3 (n=25)	36.8%
Grade 4 (n=1)	22.1%
Grade 5 (n=5)	7.4%
GLEASON SCORE(n=68)	7.32 ± 0.8
BONE METASTASIS(n=68)	
PRESENT	15(22.1%)
ABSENT	53(77.9%)

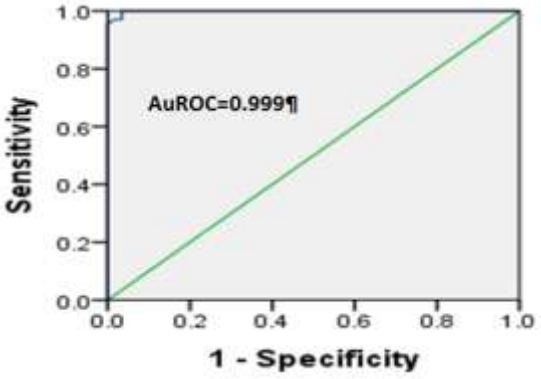

Figure No. 1: Receiver operating characteristic curve (ROC) of serum prostate-specific antigen in the prediction of tissue diagnosis.

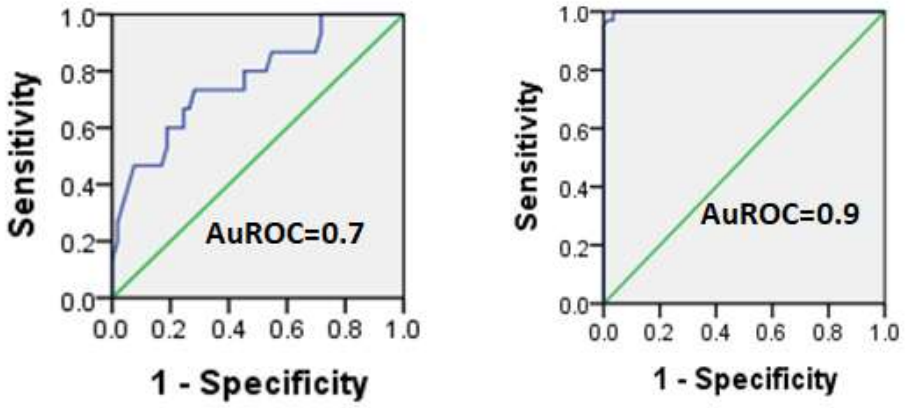

FIGURE 2: Receiver operating characteristic curve (ROC) of serum prostate-specific antigen in the prediction of aggressiveness (Gleason score>7) and bone metastasis respectively.

Table 2: Sensitivity, specificity, PPV, NPV and diagnostic accuracy of PSA levels.

PSA ng/ml Cut off point	Sensitivity	Specificity	PPV	NPV	Diagnostic accuracy
7.055	100 % *(94.72)	96.55% *(88.09)	97.14% *(89.70)	100 % *(93.62)	98.41% *(94.38)

*Confidence interval

PSA, prostate-specific antigen; PPV, positive predictive value; NPV, negative predictive value;

Gleason grades	N	PSA levels (mean ±S. D)	P-value
Grade 1	5	9.53±1.93	
Grade 2	18	13.77±2.62	
Grade 3	25	20.09±6.92	
Grade 4	15	36.23±13.45	
Grade 5	5	59.70±11.59	
Total	68		
*ANOVA applied			
Multiple comparisons by post hoc analysis			
Gleason Grades		Mean Difference	P-Value
Grade 1	Grade 2	4.23	085
	Grade 3	10.55	0.08
	Grade 4	26.70	< 0.001**
	Grade 5	50.16	<0.001**
Grade 2	Grade 3	6.32	0.11
	Grade 4	22.46	<0.001**
	Grade 5	45.92	<0.001**
Grade 3	Grade 4	16.14	<0.001**
	Grade 5	39.60	<0.001**
Grade 4	Grade 5	23.46	<0.001**
*Tukey's test applied ** Significant result			

DISCUSSION

PSA and DRE are the initial steps taken by the clinician to diagnose prostate cancer. This is followed by prostate biopsy which is considered the gold standard of diagnosis.[3]. Guidelines for prostate cancer screening remain controversial. Two studies were conducted in the 1990s, in which a transrectal ultrasound-guided, systematic prostate biopsy was performed after PSA testing. Those were named the European Randomized Study of Screening for Prostate Cancer (ERPSC) and the randomized GÖTEBORG-1 experiment. PCA mortality was significantly reduced in both studies; however, there was also a greater risk of false

diagnosis[10]. Owing to the global controversy around PSA's diagnostic accuracy, several health professionals have developed unique guidelines for PSA-based PCA screening. Because of racial and cultural disparities in PCA causation, PSA may be less sensitive and specific to PCA across races. Therefore, assessing and ascertaining the diagnostic efficacy of PSA and its substitutes in all racial categories is critical[5]. We aimed to highlight the productivity of PSA levels in a subset of the Karachi population regarding PCA diagnosis, aggressiveness, and metastasis.

In our study, 126 patients of the prostate biopsy were included of which 68 were PCA with a percentage of 53.96% and 58 were BPH with a percentage of 46.03%. Since we have done convenient sampling to collect our sample size, they are not representative of the entire PCA and BPH case population in our country. However, a five-year study about prostatic lesions conducted in Lyari General Hospital, Karachi, Pakistan, which comprised 158 samples revealed a proportion of BPH and PCA 95.6% and 4.4% respectively. A meta-analysis in Pakistan showed an increasing prevalence of PCA between 2% to 8%[11].

In our study mean age and PSA in BPH cases were 66.48± 7.87 years and 4.12±1.71 ng/ml respectively. Similarly, the mean age and PSA in PCA cases were found to be 69.62±7.79 years and 24.11±15.58 ng/ml respectively. According to a study done at Dow University of Health Sciences, BPH patients were found to be typically between 60 and 70 years old, which is similar to our results[12]. Globally men over 65 are more likely to develop PCA, and over 80% of cases are detected after that age[13] Which is comparable to our results. However, in PCA patients mean PSA in the Asian population was found to be 14.8 ng/ml[14]. Higher values of 45.59 ng/ml were found in the Indonesian population in contrast to the international consensus[15] and also to our results. It is suggested that a large dataset for both groups with a uniform distribution should be assessed, and PSA levels adjusted according to racial variation.

In our study mean Gleason score was 7.32±0.8 and the most common Gleason grade with an intermediate risk category was grade 3. The score was comparable to a study based on the population of Bangladesh i.e. 7.28±1.7[16]. Another study showed high grades (grades 4 and 5) in the Chinese group and low grades (grade 2) in the U.S. cohort (17). In a collaborative report on PCA in Asia, there are more patients with the initial phase of PCA and positive Gleason Scores in most Asian parts with well-established economic and healthcare systems. Nonetheless, high-grade PCA remains the most common diagnosis for individuals in China (Gleason Score > 7)[2]. This might be the pattern of underdeveloped Asian countries with limited resources and budgets for the health care system resulting in late diagnosis. Early diagnosis is possible by upgrading the health care system.

In our study, PCA with bone metastasis had a lower frequency and percentage of about 22% which is contrary to a study in the Chinese population where a higher prevalence of 44% was found.[18]. An observational study in the Denmark population also showed reduced frequency of bone metastasis which was 9.2% with initial PCA diagnosis, later 5.7% of patients developed bone metastasis during 5-year follow-up.[19]. Even while the Danish population study produced results that were comparable to ours, the limited sample size in our study means that those results might not accurately reflect our population's estimation. Findings that diverge from those of the Chinese population could be the consequence of our community's underdiagnosis or delayed diagnosis brought on by the expensive cost of medical facilities and lack of awareness of symptoms. Updating cancer diagnostic programs, free resources, and a registration system could overcome the scenario.

In our study predictability of PSA in diagnosing PCA has shown very good performance as can be seen by the area under ROC (fig.1 and Table 2) at a threshold value of 7.055ng/ml. This threshold value showed 100% sensitivity, 96.55% specificity, 97.14% positive predictive value, and diagnostic accuracy of 98.41%. Our results are in contrast to a study conducted in Thailand revealing 66% sensitivity, 88% specificity, and 74% positive predictive value at the threshold value of 20ng/ml,[3]. Another study among the Korean population showed a 100% positive predictive value at a threshold value of PSA ≥50ng/ml. The idea that various ethnic groups had varying baseline PSA levels across all age groups is supported by another study conducted in multiethnic Asian settings[20]. Therefore, for individuals of different races and ethnicities, a given PSA value may have distinct clinical implications.

The AUROC analysis revealed that while the predictability of PSA levels with Gleason scores (aggressiveness) performed well, the performance with bone metastases was only fair (Fig.2). We didn't proceed further for the threshold value due to the small sample size. Our results of PSA performance for aggressiveness were similar to a Korean study.[21] And contrast with Jammu Kashmir population where PSA performance was good with bone metastasis[22].

In our study, there were statically significant variations in PSA levels seen among different grades of prostate cancer which are similar to the findings in the Asian population according to the United States Census Bureau[14]. This indicates that PSA levels were able to differentiate among different grades.

The strength of the study was that it generated data for the Pakistani population, although the sample size was small, we were able to generate a PSA threshold value of 7.055ng/ml for predictability of PCA. At this

threshold, the risk of developing PCA is more than the BPH. Limitations of the study were the small sample size and retrospective nature of the study.

We recommend carrying out similar studies in multiple centers in the country. The government should revise its policies of health care facilities for the population so that everyone has the opportunity to get related help. Data registries and surveys are encouraged by the authorities so that enough data can be generated as per our ethnicity and race.

CONCLUSION

According to the data, PSA can predict bone metastases, Gleason grade, and PCA. Furthermore, throughout the early pathological phase, we were able to identify a threshold point at which prostate cancer should be suspected.

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Author's Contribution:

Concept & Design of Study:	Zehra Abidi
Drafting:	Nuzhat Hassan, Faraz Ahmed Baig, Inayatullah Khan
Data Analysis:	Fariha Anum, Zehra Abidi
Revisiting Critically:	Nuzhat Hassan, Faraz Ahmed Baig, Inayatullah Khan
Final Approval of version:	By all above authors

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Original Article

Comparative Analysis of the Growth Characteristics of Dental Pulp Stem Cells and Umbilical Cord Stem Cells

Fatima Fouad Qureshi[1], Shumaila Usman[2] and Saima Akram[1]

ABSTRACT

Objective: Pulpitis is one of the most prevalent dental conditions, and it's most common treatment is root canal procedure, which is has limitations. Stem cell transplantation is the promising alternative treatment. Among the various sources of stem cells available, dental pulp stem cells and umbilical cord stem cells have distinct advantages over other sources.

Study Design: In-vitro experimental study

Place and Duration of Study: This study was conducted at the at MDRL- Ziauddin University, Karachi from April 2023 to April 2024.

Methods: Dental pulp stem cells were isolated from dental pulp collected from healthy, extracted teeth. Umbilical cord stem cells were isolated from umbilical cord collected following a c-section. The cells were cultured and then population doubling time, and cell viability was assessed. Morphological analysis was also done, followed by gene expression analysis.

Results: and conclusion: DPSCS showed a shorter population doubling time, and higher growth rate compared to UCMSCS, while expressing characteristic mesenchymal stem cell markers, making them an ideal stem cell source.

Conclusion: DPSCS are a promising alternative cell source to UCMSCS for stem cell-based therapy. They have similar morphological features compared to UCMSCS and stem cell markers but have with higher proliferation capacity, significantly lower population doubling time, and high cell viability.

Key Words: Dental pulp stem cells, Umbilical cord stem cells, Tissue engineering.

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INTRODUCTION

Stem cells are the idea source for organ and bio regeneration due to their capability to specialize and undergo multi-differentiation. Their self – renewal ability, accompanied with a significantly higher proliferation rate and growth characteristics, along with, low immunogenicity effects among other biological characteristics make them suitable for biological regeneration and tissue engineering[(1)]. Isolation of Mesenchymal stem cells can be done various different tissues, including but not limited to: Umbilical cord, Bone marrow, dental pulp, adipose tissue, placental tissue etc [(2)].

[1.] Department of Oral Pathology, Ziauddin University, Karachi.
[2.] Department of Molecular Medicine, College of Molecular Medicine, Ziauddin University, Karachi.

Correspondence: Dr. Fatima Fouad Qureshi, Bachelors of Dentistry, Department of Oral Pathology, Ziauddin University, Karachi.
Contact No: 0312-2985695
Email: f.fouadqureshi@gmail.com

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Umbilical cord is an organ that provides a conduit for the exchange of nutrients, oxygen, carbon dioxide and waste products from the maternal circulation to the foetal circulation. Umbilical cord Mesenchymal Stem cells (UCMSCS), isolated from discarded umbilical cord are easy to obtain, with a large tissue size enabling easy collection and processing. This provides an advantage over Bone marrow stem cells(BM-MSCs) and Adipose derived stem cells, both of which are obtained invasively and have limitations in tissue size. Once UCMSCS have been isolated, the cells can be cultured and cryopreserved for later usage [(3)]. Studies have also shown that compared to BM-MSC, UCMSCs have low immunogenicity since they do not express markers involved in T-cell activation. They tend to have greater anti-inflammatory capabilities due to expression of specific cytokines [(4)].

UCMSCS have various applications in the regenerative, tissue engineering and cell-based therapy. They have been used for ocular diseases/regeneration[(5)] neurodegenerative diseases[(6)], cardiovascular diseases[(7)], diabetes[(8)], bone regeneration[(9)] and even autism spectrum disorder[(10)].

Isolation of dental stem cells can be done from various different sources within the oral cavity including, dental pulp, dental follicle, gingival tissue, periodontal ligament, alveolar bone, tooth germ and apical

papilla[11, 12]. Among these, dental pulp stem cells are considered as the best cell source, especially for pulpal regeneration [12].

The structure of the tooth involves a centrally located dental pulp which is enclosed by dentine, and the pulp functions to keep the pulp safe from external trauma. Dental pulp stem cells (DPSCS) are a promising source for cell-based therapies due to some specific advantages over other stem cell sources. Their isolation can be conveniently done by using the dental pulp of extracted teeth. Healthy Teeth extracted during prescribed dental procedures, which included orthodontic extraction and wisdom tooth extraction due to pericoronitis or other reasons. Such teeth are medical waste, and usually discarded after the procedure. These teeth can be utilised, dental pulp removed and isolation of DPSCS performed. This method is non-invasive, ethical and easier when studied in comparison with various other sources of stem cells such as BM-MSCs[13].

Studies have use DPSCS for treatment of cerebral ischemia[14], bone regeneration[15], pulpal regeneration[16], treatment of neural diseases[17] and in various endocrine disorders[18]. When it comes to cell-based therapy, it is vital that we select a source that is stable, available with ease, allows isolation of cells in large quantities and safe to use. Selection of an optimum stem source is essential for ensuring success of the complicated stem cell therapy. Hence, this study is aimed at comparing the growth characteristics of UCMSCS and DPSCS, both of which are known to obtained non-invasively, and have various applications, to ensure successful future stem – cell-based treatment.

METHODS

Isolation / Culture of Dpscs: Healthy teeth were collected after routine extraction of third molars, or premolars removed for orthodontic procedures. All teeth were collected from the OPD of Ziauddin university, department of oral surgery. The teeth were collected from young adults, between the ages of 14 years and 30 years. Consent was obtained prior to collection of the extracted teeth. The pulp was isolated from the tooth following the method established previously. Briefly, the tooth was collected in chilled transport media. An access cavity was prepared on the occlusal surface of the tooth, using a straight fissure diamond bur and copious irrigation. After the pulp chamber was exposed and the canals located, the pulp was removed using a barbed broach and placed in fresh chilled transport media and taken to Multidisciplinary lab at Ziauddin university. The pulp was placed in petri dishes under the Biosafety hood and washed with Phosphate buffer saline at least 4 times. Following this, it was minced and then placed in 1x trypsin for enzymatic digestion for 30 minutes. The sample was then centrifuged and minced further. The sample was then cultured in a T-25 flask with DMEM (Dulbecco's modified eagle medium). The culture media was supplemented with 10%FBS (Foetal bovine serum), 1% Penicillin and streptomycin and 1% Sodium Pyruvate. Following which the cells were incubated at 37°C. The media was changed every 72 Hours, and the cells were subpassaged when they reached 70-80% confluency.

Isolation / Culture of Ucmscs:

Umbilical cord was collected from healthy mothers undergoing C-section surgery at Ziauddin hospital. The sample was taken after obtaining prior consent from full-term mothers, with no known co-morbidities. After the delivery, a 3-inch section of the umbilical cord was cut off close to the placental end and washed with PBS (Phosphate buffer saline) 6 times before being placed in chilled PBS for transportation. The sample was then taken to Multidisciplinary lab at Ziauddin university. The sample was then taken out on petri dishes under the biosafety hood, and the sample was washed once again PBS to ensure that no blood remained. Following this the cord was then minced into smaller pieces of about 1 cm, and then placed in a T-25 flask. Culture of the UCMSCS was done in DMEM supplemented with supplemented with 10%FBS, 1% Pen/strep along with 1% Sodium Pyruvate. Following which the cells were incubated at 37°C. The media was changed every 72 Hours, and the cells were subpassaged when they reached 70-80% confluency

Morphological Analysis: The cells were viewed using the inverted phase contrast microscope at 40X magnification. The cells were observed at each passage, pP0, P1, P2, P3 and P4 and their images were captured. The cell shape, size and various morphological features were compared at each passage.

Growth Characteristics: For the growth analysis, the cells were selected taken at each passage, i.e , P1, P2, P3, P4, For both DPSCS and UCMSCS. 100,000 cells were seeded in the flasks and incubated. The cells were the trypsinized after 24 hours, 48 hours, 72 hours, 96 hours and 120 hours. Cell counting was performed at each stage using a haemocytometer, with dead cells being stained with trypan blue and the number of cells noted at each stage.

The formula utilized to calculate the PDT is

$DT=T \ln 2/\ln (Xe/Xb)$

Where,

T = Time for which the cells were incubated.

Xb = cells that were seeded at the start of incubation period.

Xe = cells that were present when the incubation period finished

Cell Viability: The numbers of viable cells were counted by hemocytometer with trypan blue to provide a rapid estimation of quantitative culture count. A 1:1 dilution of the cell suspension and Trypan Blue dye in PBS was prepared. The cells were then loaded carefully on the hemocytometer to check the viability of the cells. Trypan blue solution was incubated for two to five

minutes before loading. Non-viable cells were stained dark blue while viable cells will remain unstained.
The formula utilized to calculate the cell viability is:
Cell Viability = No. of unstained or living cells / Total number of cells.

Gene expression Analysis: Cells were trypsinized and 1 mL TRIzol reagent was added to DPSCS and UCMSCS. Following this Chloroform was added and the incubation of the cells was done at 25 ˚C for a time period of 15-20 minutes. The mixture then underwent centrifugation at 10,000 r.p.m for 10 minutes at 4°C. Upper aqueous phase was collected as the supernatant and 1ml Isopropanol was added to the supernatant. Incubation of the mixture was done at 25°C for about 30 min and this was followed by centrifugation again at 10,000 rpm for 15 min. 1ml of 70% Ethanol was added to the RNA pellet after removal of supernatant and the mixture was again centrifuged. Removal of supernatant was done and the pellet was allowed to air dry before DPEC added. RNA concentration and Purity were quantified using a Multi-Sky Mass Spectrophotometer. cDNA synthesis was done using Revert Aid First Strand cDNA synthesis kit as stated in the manufacturer's protocols. The cDNA was then stored at -20°C. The primers were designed and purchased and then reconstituted in Tris-HCl/EDTA (TE) buffer.
Table 1 lists the primers and their sequence. . PCR was performed using the Go Taq Green Master Mix following the recommendations of the manufacturer. Briefly, the reaction mixture was prepared using: 10.5 µl of cDNA, 12.5 µl of Master mix, 0.5 µl of each primer, 1 µg of cDNA. The reaction mixture was then placed in the thermocycler for PCR. The agarose gel was prepared, and ethidium bromide was added to the mixture, following which the gel was polymerized. Gel electrophoresis was performed for 45 minutes at 70 volts. Gel documentation system Gel doc system herolab was used to analyze the gel.

Statistical Analysis: SPSS. Version 20 was utilised for analysing the statistical data. For comparison of UCMSCS and DPSCS Independent T-test was used. P-value of less than 0.05 was considered statically significant.

RESULTS

Morphological Analysis: The morphology of DPSCS showed spindle/ fibroblast like shape, with a multi-nucleated morphology and variable polygonal shape. The morphology remained same between the passages. The DPSCS tended to form colonies, forming a more polygonal shape as they became confluent forming a monolayer. The DPSCS cell size was smaller compared to UMSCS. UCMSCS showed a fibroblast like morphology, similar to other mesenchymal stem cells. They had a large centrally located nucleus and had a larger cell size and more spread-out morphology compared to DPSCS.

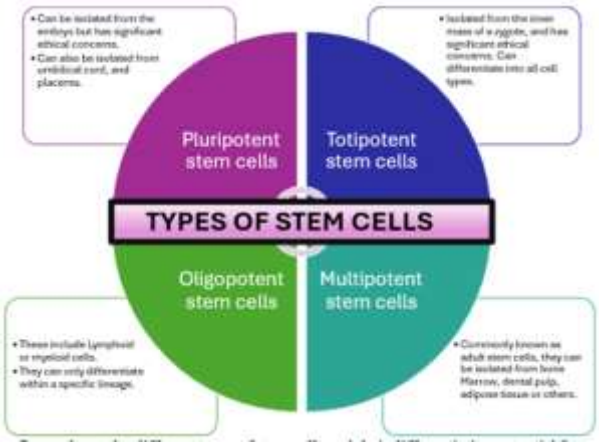

Figure No.1: The figure shows the different types of stem cells and their differentiation potential.

Table No. 1: Lists of primer sequences and product size

Gene of interest	Primer	Sequence	Product size
CD90	F Primer	TTGGATGAGGAGTGGTTGGG	181
	R primer	TTGGTTGTGGCTGAGAATGC	
CD73	F Primer	GCTCTTCACCAAGGTTCAGC	198
	R primer	TCGATCAGTCCTTCCACACC	
CD105	F Primer	TCCATTGTGACCTTCAGCCT	176
	R primer	CTTGGATGCCTGGAGAGTCA	
OCT 4	F Primer	AAAGACCATCTGCCGCTTTG	163
	R primer	GGTTCGCTTTCTCTTTCGGG	
HLA-DR	F Primer	TGGGACCATCTTCATCATCAAGG	250
	R primer	GGGCATTCCATAGCAGAGACAGAC	
GAPDH	Forward	CCAGAACATCATCCCTGCCT	185
	Reverse	CCTGCTTCACCACCTTCTTG	
VIMENTIN	Forward	TGTTTCCAAGCCTGACCTCA	182
	Reverse	CTCCGGTACTCAGTGGACTC	

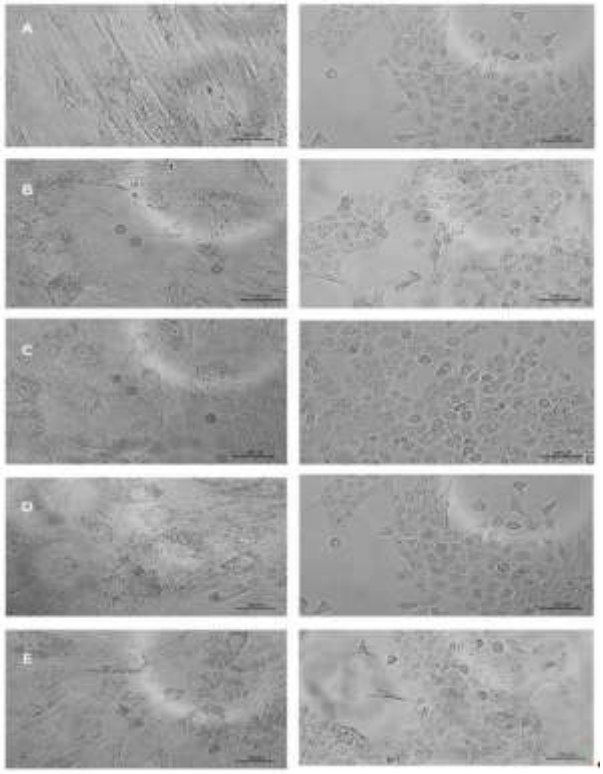

Figure No. 1: A shows DPSCS (on left) and UCMSCS (on right) at P0. B shows DPSCS and UCMSCS at P1. C shows DPSCS and UCMSCS at P2. D shows DPSCS and UCMSCS at P3. E shows DPSCS and UCMDCS at P4.

Growth Curve, Population Doubling Time and Cell Viability:

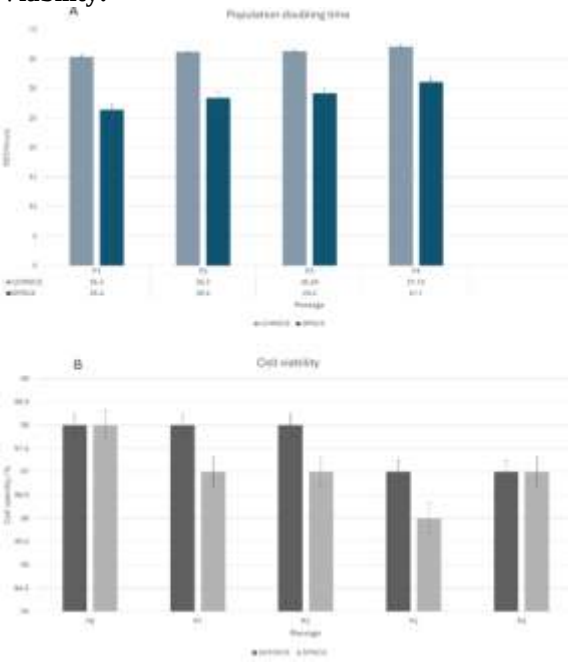

Figure *No.* 2: A shows the population doubling time for UCMSCS and DPSCS.B shows cell viability of DPSCS (orange) and UCMSCS (Blue).

UCMSCS showed a significantly higher population doubling time of around average of 36.2hours ± 0.7, with a less steep growth curve and a mean growth rate of 0.577 ± 0.041. DPSCS showed a much lower population doubling time, of around 28.7 hours ± 1.94 and a mean growth rate of 0.305 ± 0.083. The mean cell viability of UCMSCS was 97.7% ± 0.500 while the mean cell viability of DPSCS was 97.0% ± 0.816.

Gene Expression Analysis:

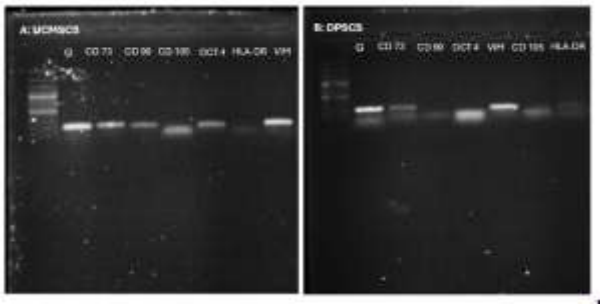

Figure No. 3: A shows the results of gel electrophoresis for UCMSCS.

UCMSCS showed positive gene expression for CD 73, CD90, CD105, OCT 4, Vimentin while they were negative for HLA-DR, which is a hematopoietic stem cell marker. DPSCS, similarly, showed positive gene expression CD 73, CD 90, OCT 4, VIM, CD 105 and negative to hematopoietic marker HLA-DR.

DISCUSSION

A promising alterative treatment to current Endodontic therapy and an advancement in regenerative endodontics is stem cell-based therapy. Various sources of stem cells are available, but UCSMSCs and DPSCS both have the advantage of being isolated from medical waste, and hence can be collected non-invasively. They are also deemed ethical acceptable, and both have shown multi-potent characteristics. Hence, this study evaluated their comparative growth characteristics.

Morphological analysis showed that UCMSCS and DPSCS both had a spindle shaped appearance, similar to fibroblasts which is typical of mesenchymal stem cells, as reported previously[19, 20]. Although, dental pulp stem cells showed a variable morphology, often exhibiting a more polygonal shape along with the spindle shape appearance. This phenotypic heterogenicity has been reported previously[21]. The UCMSMS and DPSCS both maintained morphological features from P0 to P4.

PDT and growth rate was used to assess the proliferation capacity. DPSCS growth rate of about 0.305 ± 0.083, and a mean population doubling time of 28.775 hours. No significant change was seen between passages. The proliferation rate of UCSMSCS on the other hand, was significantly lesser, with mean population doubling time at P0 to P1 around 36.2 hours and a growth rate of 0.577 ± 0.041. Our results was similar to previous studies as reported by Utumi et al[12]

who both reported DPSCS having a higher proliferation capacity. The cell viability assay showed low cell death and high viability in both UCMSCS and DPSCS.

Gene expression analysis showed that DPSCS and UCMSCS were positive for gene expression of the markers CD 73, CD 90, CD 105, OCT 4, VIM while negative for HLA-DR. This confirms their stemness, exhibiting positive mesenchymal stem cell markers, while negative for hematopoietic marker [(22)].

CONCLUSION

DPSCS are a promising alternative cell source to UCMSCS for stem cell-based therapy. They have similar morphological features compared to UCMSCS and stem cell markers but have with higher proliferation capacity, significantly lower population doubling time, and high cell viability.

Author's Contribution:

Concept & Design of Study:	Fatima Fouad Qureshi
Drafting:	Shumaila Usman, Saima Akram
Data Analysis:	Saima Akram
Revisiting Critically:	Fatima Fouad Qureshi, Shumaila Usman
Final Approval of version:	By all above authors

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

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Original Article

Assessing Mothers Vaccination Practices Attitudes and Knowledge: A Cross-Sectional Study

Naseer Ahmad Memon, Azizullah Langah, Ameer Ali Jamali, Munawar Ali Siyal, Karam Khushik and Ali Akbar Siyal

ABSTRACT

Objective: To access the knowledge, attitude, and practices regarding childhood vaccinations among mothers will be evaluated, as well as factors that determine vaccination compliance and skepticism.

Study Design: A Cross-sectional Study

Place and Duration of Study: This study was conducted at the Department of Pediatrics, Peoples university of Medical Health Sciences NawabShah from February 2023 to July 2023.

Methods: A quantitative approach of descriptive cross-sectional design was used to sample 150 mothers with children less than five years of age. To assess the levels of vaccination knowledge, attitudes and practices an interviewer administered structured questionnaire was used. Quantitative data was described by basic descriptive statistics, and associations were tested with the chi square test. The findings were described using standard deviation (SD) and p values.

Results: Out of 150 participants, 120 received vaccines strictly according to the schedule while 30 patients claimed that they received their vaccines later or fewer doses. Knowledge score of mothers was 7.8 (± 1.2). A general positive attitude towards vaccination was depicted in 85% of the respondents. A very close relationship was established between knowledge scores and vaccination compliance ($p = 0.02$). Lower scores were significantly done by those reporting hesitancy ($p < 0.05$).

Conclusion: This study shows that although the majority of mothers' adhere to vaccination schedules there is still a lack of knowledge. Awareness campaign, learning through knowledge or health interventions could help remove the ignorance and help people follow the immunization programs.

Key Words: Vaccination, mothers, attitudes, immunizations, immunization practices.

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INTRODUCTION

Immunization is an important and cheap health measure that has led to a decline of many communicable diseases for example measles, diphtheria and poliomyelitis across the globe. According to an approximate calculation, vaccinating helps save between 2 and 3 million children's lives every year, which proves the significance of the activity for Children's health worldwide[1].

However, concerning low optimal vaccine coverage rate is still an incongruity; moreover, it is still a concern even in the current face of vaccine manufacturing and accessibility improvements as well as vaccines' efficiency that has been proven[2]. These gaps lead to outbreaks of certain diseases which are immunity preventable provided immunization has been availed in right prophylactic measure[3].First of all, parents and especially mothers can greatly influence the vaccination of their children as the latter largely rely on their mother to take them to the medical facility. Maternal KAP is determined as a reasonable predictor of vaccine acceptance and compliance with immunization timetables[4]. The choice to vaccinate a child can be influenced by; knowledge and perception about vaccines, cultural beliefs, access to health services and attitudes towards doctors[5]. Higher educated mothers protect their children better by fully vaccinating them, whereas minority groups or women with misconception about vaccines. oracle cite:[6]The reluctance or refusal to accept vaccines where they are available is known as vaccine hesitancy and has gained importance in recent years[4]. There are some unfounded information especially through social media influencing people's attitude toward taking the vaccines, safety and possible side effects of vaccines have remained a cause for

Department of Pediatrics, Peoples university of Medical Health Sciences NawabShah.

Correspondence: Azizullah Langah, Associate Professor of Pediatrics, Peoples university of Medical Health Sciences NawabShah
Contact No: 0333-5439193
Email: drazizullah@pumhs.edu.pk

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hesitancy across several groups of people[7]. This study aims at establishing the level of knowledge of mothers, and their attitudes towards immunization with the view to enhancing compliance and reducing vaccine refusal. The study seeks to establish the level of knowledge, attitude and practice among mothers on childhood vaccination. In their study, the authors aim at understanding what may cause hesitancy or adherence to vaccination with a view of informing the healthcare stakeholders on some essential considerations towards the augmentation of vaccination compliance and reduction of vaccination-preventable diseases.

METHODS

This cross sectional study was carried out for 6 months in the pediatric outpatient clinic of a tertiary care hospital. To do this, 150 mothers who had at least one child under five years of age were consented into the study. In the present study, the population sample was recruited through convenience sampling. A pilot tested, formally structured questionnaire was used to elicit information regarding vaccination practices, beliefs and information. All participants completed the research survey voluntarily and available evidence was used to gain their informed consent.

Data Collection: Information was obtained through individual interviews with/by health care professionals who were provided with standard training. The questionnaire comprised three sections: knowledge about vaccination, their perceptions of vaccines and general beliefs of people, especially the scientific community regarding vaccines. Questions posed to mothers included: Which shots have been given?, Was the child given on time as scheduled?, If not, why?, What do you know about the risks and benefits of giving shots at the right time?.

Statistical Analysis: Data were entered into and analysed using Statistical Package for the Social Scientists version 24.0. Quantitative measures of central tendency were computed for descriptive purposes with demographic data and responses. To establish whether there is correlation in knowledge, attitude and practice of vaccination among these mothers, chi-square tests were conducted. Statistical analysis used depended on study design, and significance level was set at alpha= 0.05.

RESULTS

Among the 150 mothers interviewed, 80% stated that they strictly followed the recommended vaccination programmes for their children while the rest, a 20% had either delayed or not vaccinated their children at all. The mean knowledge score with regard to HIV/AIDS was 7.8 out of 10 (SD ± 1.2) among the mothers. We found a correlation between increased knowledge scores and compliance with vaccination schedules ($X2 = 6.278$, $p = 0.02$). All the perceived risks and benefits did not significantly affect the level of vaccination, except perceived susceptibility and attitudes where women with positive attitudes toward vaccination had a significantly higher probability of taking their children for the vaccine at the rightful time ($p < 0.05$).

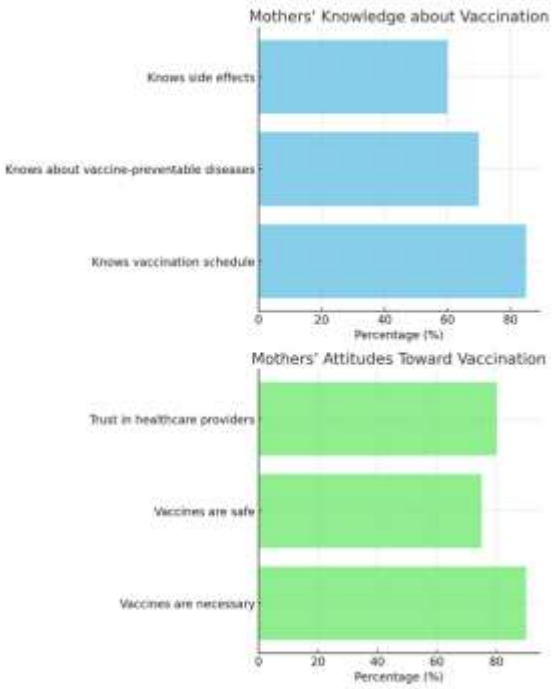

Figure No. 1: Knowledge about vaccination with percentage

Table No. 1: Demographic Characteristics of Participants

Characteristics	Category	Frequency	%
Age (years)	18-25	35	23.3
Education Level	Primary	60	40.0
Socioeconomic Status	Low	45	30.0

Table No. 2: Mothers' Knowledge about Vaccination

Knowledge Items	Yes (%)	No (%)
Knows vaccination schedule	85	15
Knows about vaccine-preventable diseases	70	30
Knows side effects	60	40

Table No. 3: Mothers' Attitudes Toward Vaccination

Attitude Items	Agree (%)	Disagree (%)
Vaccines are necessary	90	10
Vaccines are safe	75	25
Trust in healthcare providers	80	20

Table No. 4: Mothers' Practices on Vaccination

Practice Items	Yes (%)	No (%)
Complete vaccination schedule	80	20
Delayed vaccination	20	80
Missed doses	15	85

DISCUSSION

This study reveals that there is a moderate level of concordance of mothers' KAP regarding childhood vaccination with those in comparable studies. On the level of knowledge, this study found that 85% of the mothers were aware of the national recommended vaccination schedule and 70% had knowledge in vaccine-preventable disease. These results correspond with the study done in Nigeria showing that 78% of mothers had positive knowledge on vaccination schedule and diseases that could be prevented by vaccines[8]. We have seen a similar situation in India, where they established that over 80% of mothers had some understanding or were aware that vaccines are of importance in immunization and low numbers of children dying from diseases as a result of immunization[9]. Such results indicate that, although most people have some conceptual understanding regarding vaccines, this may not translate to sufficient disease or individual vaccine understanding in specific population groups. However, survey done within the Bangladesh found that the 60% of the mothers possessed basic knowledge about the vaccination schedules, but the knowledge level of the present study was higher[10]. This may be so due to variations in the level of education, healthcare and awareness or successful spread of a particular public health crusade between the two circles. Some of the areas in need of knowledge enhancement could be targeted through awareness creation campaigns in order to enhance chances of improved vaccination. Concerning attitudes 90% of the mothers in this study felt the need of vaccines in addressing the health of their children and 75% attributed the vaccines as safe. These results are similar to those of research conducted in Saudi Arabia and Turkey, and in both cases more than 85 percent of the mothers interviewed supported the opinion regarding the necessity of vaccination of children to protect them from diseases[11,12]. Perceived benefits and perceived control have been pinpointed as significant factors that can predict vaccination compliance; the following experimental evidence is extracted from Ethiopia: maternal confidence in vaccines and health care providers also influenced the compliance to vaccination schedules[13]. Still, only a quarter of the mothers in this study had safety concerns regarding the vaccine, but this was expected considering a study by Larson et al., that focused on global vaccine hesitancy where fear of safety effects was ranked as a major factor towards vaccine rejection or delay. In the same way, the studies in the United States revealed that 7-30% of parents had concerns related to the safety of the vaccines, most of which would avoid or delay vaccination[14-15]. Eliminating these factors through effective health literacy or better still, appropriate knowledge that is passed across to the population by health professionals, could go along way in addressing concerns raised and boost general vaccine uptake. The practices observed in this study are also coherent with those highlighted in other experiments. According to the survey, 80% of the mothers followed the vaccination schedule as advised; 20% received delayed or missed doses. These results are comparable with the study conducted in Pakistan in which 75% of mothers complied with the recommended vaccination schedule, and 25% responded that they delayed their child's vaccination because of misconceptions and concerns related to side effects. However, a study conducted on the mothers in Brazil revealed that majority of them 90% observed the immunization schedule while only 10% said they had delayed immunizations mainly due to transport difficulties[17].Peculiarly, the 20%, of response found wanting by this study is higher than the 15% identified in a study conducted in Japan where delays were chiefly a result of cultural values but not safety[18].

CONCLUSION

This research also reveals that most mothers were knowledgeable and possessed positive attitudes towards vaccination thus high vaccination compliance. But safety concerns related to the vaccines and falsehood and fake information from the social media affect the delay and hesitancy in a significant percentage of the mother. Such problems need to be solved in order to increase the level of immunization.

Limitations: In the light of the above work, some considerations are the following: the use of self-administered questionnaires that can generate biased results, and the use of a single healthcare setting which restricts the generalization of the findings to other areas. Further, there are some limitations to the current study that is; the role of socio-economic status was not disaggregated in the current study and therefore gave general information only regarding vaccination.

Future Findings: The subsequent studies should concentrate on identifying perception of RCs professionals in combating misperception and the effect of specific enlightenment crusade. Further benefits for improving vaccination coverage will also be achieved by understanding how economically disadvantaged persons are affected by the availability, accessibility and usage of vaccines, and by tackling challenges of distribution and storage in areas where these services are scarce.

Author's Contribution:

Concept & Design of Study:	Ameer Ali Jamali, Munawar Ali Siyal
Drafting:	Naseer Ahmad Memon, Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Data Analysis:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Revisiting Critically:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Final Approval of version:	By all above authors

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Original Article

Typhoid Salmonella Strains in Pakistan Posing a Potential Risk to Drug-Resistant

Drug Resistant Salmonella Typhi Strains in Pakistan

Karam Khushik, Ali Akbar Siyal, Munawar Ali Siyal, Ameer Ali Jamali, Naseer Ahmad Memon and Azizullah Langah

ABSTRACT

Objective: The objective of this cross sectional research study will be to determine the proportion of total and drug resistant Salmonella Typhi strains in 100 patients admitted in hospitals with typhoid fever in Pakistan.**Study Design:** A Cross sectional study .

Place and Duration of Study: This study was conducted at the Department of Pediatrics Medicine, University of Medical and Health Sciences for Women Nawabshah Sindh. From 1st Jan 2022 to 30th September 2022.

Methods: A descriptive cross-sectional design was adopted for the study whereby one hundred patients diagnosed with typhoid fever were included in the study. Blood specimen were obtained and inoculated into culture media to isolate Salmonella Typhi. As typing to determine drug resistance, antibiotic susceptibility testing was done. Descriptive statistics was conducted on SPSS version 24.0 and the level of significance used in analysis was $p < 0.05$.

Results: Of the 100 patients, 60 % of the patients were positive for drug resistant S. Typhi. The overall mean age of the patients enrolled in the study was thirty one point three years (SD ± 6.5). MDR was observed in this study to be 45%, with recipe for ciprofloxacin at $p = 0.03$. Total duration of stay also differed significantly in drug resistant bacteria patients who took longer time to recover than patients with non-resistant bacteria (mean= 14.5 days, $p < 0.05$).

Conclusion: The study shows a worrisome trend of multiresistant S. Typhi in Pakistan, based on its results. This demands for more emphasis on the public health measures to prevent or reduce the use of antibiotics as well as enhance sanitization in addition to emergence of new therapeutic approaches against the strains.

Key Words: Endemic infectious disease, Typhoid, Salmonella Typhi, drug resistance, Pakistan.

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INTRODUCTION

Typhoid fever is a serious fever that develops from the Salmonella enterica serovar Typhi (S. Typhi), transmitted through the contaminated food or water. Typhoid fever is now prevalent in most LMICs, most especially in South Asia due to insufficient access to both clean water and sanitation facilities. Based on the WHO estimate, about 11–20 million people develop typhoid fever annually, and about 1% of them die if their illness is not treated[1].

Department of Pediatrics, Peoples University of Medical and Health Sciences for Women, Nawabshah Sindh.

Correspondence: Ali Akbar Siyal, Professor Department of Pediatrics, Peoples University of medical and health sciences for women Nawabshah Sindh.
Contact No: 0300-3283727
Email: profakbarsiyal@gmail.com

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In Pakistan the disease burden of typhoid fever is substantially high because of its environment and social demographic characteristics[2] Further, the typhoid fever is more common in urban and peri urban environments where Sewerage infrastructure is lame.In the last few decades, multidrug resistance in S. Typhi including extended-spectrum beta-lactamase (ESBL) producing isolates has received increasing attention worldwide, despite initially being reported from Pakistan only. These strains show resistance to first-line antbiotics such as chloramphenicol, ampicillin and trimethoprim sulphamethoxazone[3]. An emerging risk posed by extensively drug-resistant (XDR) S. Typhi, which is resistant to most antibiotics, including fluoroquinolones and 3rd generation cephalosporins, has been identified in Pakistan since 2016[4]. The appearance of XDR strains reduces the number of potential treatments and raises the likelihood of severe disease, complications, and death. Consequently, health care providers are worried by the scarcity of proper antibiotics in controlling bacterial infections [5].Prior research points out that multidrug resistant S. Typhi strains have rapidly emerged in Pakistan and the factors include lack of prescription gateway for antibiotic, inefficient

infection control measures, and hygienically unsound environment[6]. A cross-sectional study done in Karachi during 2013 showed that more than 90% of S. Typhi isolates were having resistance to at least one group of antibiotics and XDR was observed in 27% of the strains[7]. Overall, our data support the need for enhanced monitoring, rational use of antibiotics, and successful community mobilisation to contain emerging resistant clones.Moreover, unusual manifestations of typhoid fever make clinical treatments additionally challenging because resistance to quinolones, including ciprofloxacin, has spread widely, which was one of the most effective treatments for both adult and pediatric patients. Another developing problem is decreasing sensitivity to more recent drugs such as azithromycin[8]. Lately, the burden of disease has concerned public health policies and the World Health Organisation, although the development of typhoid conjugate vaccine (TCV) has been an achievement the spreading of drug-resistant strains is persistent[9].this study is to determine the proportion of S. Typhi isolates that requir the use of third-generation cephalosporin or more in patients with typhoid fever in Pakistan and the level of resistance among the isolates to the commonly used antibiotics. As XDR typhoid becomes more frequent, it becomes imperative to identify the resistance profile in such strains to help guide the recommended treatment regimens and control interventions in high endemic areas.

METHODS

One hundred patients, who met the case definition of confirmed typhoid fever by blood culture, were recruited in the study. The inclusion criteria included patients of any age and gender. Susceptibility tests of the isolated S. Typhi strains were performed by disk diffusion method on Mueller Hinton agar, as per CLSI recommendations. The antibiotics used in this study were ciprofloxacin, azithromycin, ceftriaxone and chloramphenicol.

Data Collection: Information on the patient's characteristics, signs and symptoms at presentation and antibiotic resistance was obtained by questionnaire. Blood samples were taken For S. Typhi isolated strains, antibiotic susceptibility test was carried out using the disk diffusion method.

Statistical Analysis: Descriptive statistics analysis was done using the SPSS version 24.0 for windows. For the purpose of description of patient's characteristics quantitative data was used and chi square was used to determine whether drug resistance has relationship with clinical end point or not. Statistical significance was determined at p-value of less than 0.05.

RESULTS

According to their results, 60 percent of the 100 patients with confirmed Typhoid fever were positive to have drug resistant S. Typhi strains resistant. The mean patient age was 28.3 years (SD ± 6.5) and 55 percent of the sample being males. Out of the DR isolates, 45% were MDR and 15% XDR with resistance to cipro earm/ofloxacisin and ceftriaxone. Resistance to ciprofloxacin was 2 times higher and the difference was statistically significant (p = 0.03). XDR group of patients reported a longer duration of illness, mean time of 21 days (SD ± 4.2) than patients with non-resistant cases mean time of 14 days (SD ± 2.7, $p < 0.05$).

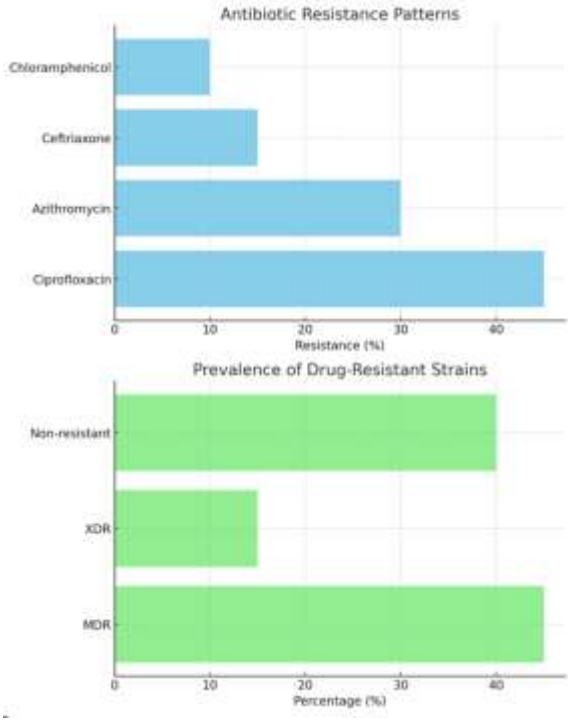

Figure No. 1: Antibiotic Resistance Pattern and prevalence of Drug Resistant Strains

Table No. 1: Demographic Characteristics of Participants

Characteristics	Category	Frequency	%
Age (years)	18-40	60	60
Gender	Male	55	55
Location	Urban	70	70

Table No. 2: Antibiotic Resistance Patterns

Antibiotic	Resistance (%)
Ciprofloxacin	45
Azithromycin	30
Ceftriaxone	15
Chloramphenicol	10

Table No. 3: Prevalence of Drug-Resistant Strains

Resistance Type	Frequency	%
Multidrug Resistant (MDR)	45	45
Extensively Drug Resistant (XDR)	15	15
Non-resistant	40	40

Table No. 4: Clinical Symptoms

Symptoms	Frequency	Percentage (%)
Fever	85	85
Abdominal Pain	70	70
Diarrhea	65	65
Fatigue	60	60

As for clinical symptoms, fever, abdominal pain, and diarrhea were most frequently observed : at least in 80% of all the patients. Regarding treatment outcomes, patients infected with drug-resistant strains also more often developed complications, such as prolonged fever and hospitalization ($p = 0.04$). Overall, patients with XDR S. Typhi were sicker, had longer lengths of stay, and needed more potent antibiotics confirming the effect of drug resistance in typhoid fever treatment.

DISCUSSION

Drug-resistant STs in Pakistan, concludes in harmony with and in contrast to prior studies carried out in the region and other parts of the world. Multidrug-resistant (MDR) as well as extensively drug-resistant (XDR) strains of S. Typhi has emerged on the horizon as a major public health concern in regions where it is endemic, such as South Asia. Among the identified S. Typhi isolates, 60% of the patients were taking MDR and/or XDR strains where 45% MDR and 15% XDR. These results are concurrent with a Karachi, Pakistan cross-sectional study which also found the frequency of MDR and XDR strains to be high above 40 percent of isolates carried multidrug resistance. Another study done in Pakistan established similar odds of MDR strains with the overall resistance of 44% of isolates to first-line antibiotics hence a growing concern of antibiotic resistance in the region. New strain of XDR typhoid has emerged in Pakistan that makes the situation even worse because the available treatment becomes restricted. In this study, the XDR strains were resistant to both ciprofloxacin and ceftriaxone, two of the last resort for treating complicated typhoid fever. This is in concordance with study done by Klemm et al. 2018 where high level of resistance was noted towards fluoroquinolone and 3rd generation cephalosporin in XDR S.Typhi isolates from Pakistan[4]. Cross resistance has led to the rapid spread of these strains across Pakistan especially in urban centers such as Karachi, the subject of many studies as a significant health hazard. On the other hand, researches conducted in examine neighbouring countries like India and Bangladesh have found slightly lower proportion of MDR and XDR S. Typhi strains. One study in India reported the prevalence of MDR strains to be 30 % and that of XDR strains to be 10 %: thus, drug resistant TB is present in India but possibly not to the same extent as in Pakistan. These differences in the patterns of antibiotic resistance could be as a result of difference in usage of the drugs, the health facility, treatment and health policies among the countries. The clinical manifestations noted in this study of patients with XDR S. Typhi highly resembled other investigations, with longer durations of recuperation and more often complications. Qamar et al. (2018) showed that patients with XDR strains needed longer hospital stays and more intensive antimicrobial therapy, including azithromycin and carbapenems, the agents that are not generally used for typical typhoid therapy[6]. This correlate with the present study's result, wherein patients with XDR have longer recovery time as those with non-resistant strain ($p < 0.05$).Several prior works have demonstrated the link between the unchecked use of antibiotics and the creation of new drug resistant S. Typhi strains. In Pakistan, easy access to drugs particularly antibiotics without prescription added to poor health literacy underpins the development of resistance[10]. A similar trend has been noticed in other developing countries where poor use of antibiotics has resulting in high resistance. A research done in Ethiopia noted that government and health departments should consider increasing the restrictions to the sale of antibiotics and conducting awareness creation on the risks of AU[11]. this study's findings that 30% of mothers attributed their lack of understanding about vaccines and consequent abuse of antibiotics to misinformation received on social media is corroborated by a study done on mothers in the United Kingdom. In that study, it was revealed that introduction of wrong facts and information on vaccines and antibiotics on social media foster the growth of drug resistance. To resolve this problem one has to find a way not only to enhance the state of healthcare policies but also to tackle the problem of wrongly processed information through the provision of relevant public health information.it can be concluded that the results of the present work are agreed with the previous studies regarding increase risk efficacy of MDR and XDR S.Typhi strains in Pakistan. The high prevalence of these resistant strains provide impetus for better stewardship, high vaccination coverage and effective public health measures in the fight against drug resistant typhoid fever.

CONCLUSION

Incidence of MDR and XDR S. Typhi in Pakistan with concern for the public health implications. The increasing levels of resistance against main drugs like ciprofloxacin and ceftriaxone has laid the need for enhanced stewardship on the use of antibiotics, immunization, and coming up with measured that can reduce the prevalence of drug-resistant typhoid.

Limitations: The primary research limitation is the conclusion of the study based on data from only one tertiary healthcare facility although the study aimed at using data from the whole population. Moreover, the number of patients in sample size was restricted to 100;

therefore, these findings are unlikely to generalize to other areas of Pakistan.

Future Findings: Subsequent studies should involve a gross population health study to define the epidemiology of drug-resistant typhoid more comprehensively. Studying the newly developed vaccines and other public health approaches targeting misuse of antibiotics used in treating salmonella Typhi might offer essential information to teaching the controlled emergence of resistant strains.

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Author's Contribution:

Concept & Design of Study:	Ameer Ali Jamali, Munawar Ali Siyal
Drafting:	Naseer Ahmad Memon, Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Data Analysis:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Revisiting Critically:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
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Original Article

Clinical Presentation of Myocarditis in Children A Cross-Sectional Study

Azizullah Langah, Naseer Ahmad Memon, Ameer Ali Jamali, Munawar Ali Siyal, Karam Khushik and Ali Akbar Siyal

ABSTRACT

Objective: To evaluate the observational, diagnostic, and therapeutic characteristics of myocarditis in 150 children attending a tertiary care hospital.

Study Design: A Cross-sectional study.

Place and Duration of Study: This study was conducted at the Department of Paediatrics Medicine, University of Medical and Health sciences for women Nawabshah Sindh from 1st April 2022 to 30th September 2023.

Methods: A descriptive letter survey was used in a sample of 150 children aged 1 month to 18 years with myocarditis. Information concerning symptoms, diagnostic tests, including echocardiography, levels of cardiac biomarkers, MRI, and treatment outcomes were obtained. Analysis of the collected data was done using the SPSS version 24.0 with a=($p< 0.05$).

Results: The age of the 150 patients ranged between 0 – 18 years with a mean age of 8.1 years and standard deviation of ± 3.9 years. Fatigue was reported by 72% of the patients, followed by shortness of breath in 68% and chest pain in 55%. Patients with heart failure were detected in 25% of cases. In combination with echocardiography, it was revealed that left ventricular systolic dysfunction was present in 82% of patients. At the onset of the obstructive sleep apnoea, developing patients experienced raised cardiac biomarkers by 88 percent. Of them 60% had a Cardiac MRI and out of those tested all were diagnosed of having myocarditis. Patients with heart failure had higher mortality than the rest ($p = 0.03$).

Conclusion: It accordingly implies that myocarditis in children produces symptoms of a broad spectrum. The earlier the diagnosis, the better; in patients who have heart failure the prognosis is even better. Echocardiography and cardiac biomarkers are still useful, whereas other techniques as cardiac MRI are more accurate.

Key Words: Myocarditis, children, echocardiography, cardiac biomarkers

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INTRODUCTION

Myocarditis is an inflammation of the myocardium and can be rather severe in children causing far-reaching complications and death. Viral infections are a common cause, there may be autoimmune reactions, and toxins can also be a source. Myocarditis in paediatric subjects currently continues to pose a diagnostic puzzle by presenting in many diverse ways, from an apparently mild illness manifesting fatigue and fever to potentially life-threatening situations such as cardiogenic shock and sudden cardiac death. Specifically, early diagnosis and management are crucial for optimising clinical prognosis and avoiding significant left ventricular dysfunction as well as other late cardiovascular sequelae, such as DCM and chronic heart failure[1].EM is most commonly due to viral myocarditis, especially enteroviruses, adenoviruses and parvovirus B19 in children. Viral myocarditis in children follows an unstable clinical course and may be either self-limited or may lead to heart failure or death[2]. Myocarditis diagnosis has been further expanded with the use of biomarkers to include high sensitive cardiac troponins and non-invasive imaging techniques including cardiac MRI which will offer high detail regarding inflammation and necrosis of myocardium[4]. Yet the advancements in diagnosis, myocarditis is still seen to be under diagnosed in children thus creating a lot of delay in handling the situation, and this results in poor outcome[4].In children, myocarditis can have some rather vague symptoms which may resemble other illnesses such as viral URIs or gastroenteritis. Since myopericarditis initial sign include chest pain, fatigue,

Department of Pediatrics, Peoples University of Medical and Health Sciences for Women, Nawabshah Sindh.

Correspondence: Naseer Ahmad Memon, Associate Professor of Pediatrics, Peoples University of Medical and Health Sciences for Women, Nawabshah Sindh.
Contact No: 0300-3216865
Email: naseer.ahmad199@yahoo.com

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shortness of breath and palpitations they mimic other ailments which children often present with especially when infected with other viruses[5]. Children are commonly only diagnosed when they are displaying severe signs of the disease, including everything from heart failure to abnormal heart rhythms. Till date researchers have also found that, delayed diagnosis and treatment has a high risk with poor prognosis and thus the need to enhance early detection[6].Biopsy of endomyocardial tissue is considered as the gold standard for diagnosing myocarditis, yet it is invasive, and therefore it is not applied to children mainly because of the potential dangers of intervention. However, it is typically diagnosed from clinical symptoms, indicated by laid-down cardiac enzymes including troponins and creatine kinase-MB, as well as with the help of diverse imaging, including echocardiography and cardiac magnetic resonance. Echocardiography remains the most frequent diagnostic technique to provide information on LD, but this method can fail to reveal slight manifestations of myocardial damage seen in MRI[7]. In addition, immunosuppressive therapy and antiviral treatment in pediatric myocarditis are still the topic of discussion, investigations showing that early therapy enhances clinical results in children with acute myocarditis[8].This cross-sectional study therefore seek to evaluate the characteristics, work up and management outcomes of myocarditis among children at a tertiary care pediatric center. With an aim of identifying the clinical features of myocarditis in children as well as the diagnostic strategies employed in the presented cohort, research effort in this study aims at identifying the most useful approaches that may help in early diagnosis and management of the condition.

METHODS

This cross-sectional study was undertaken in a tertiary care pediatric hospital over a 12-month period. In all, 150 children in the age range of 1 month–18 years with confirmed myocarditis were enrolled in the study. This included symptoms observed during clinical examination, echocardiogram, the levels of cardiac biomarkers (troponins, CK-MB) when tested, and findings from Cardiac MRI in patients who underwent the procedure. Patients with cardiac birth defect or weaning away from them underwent exclusion during the study's assessment. The data gathered in the study encompassed clients' quantitative characteristics (age, gender, etc.), clinical manifestations, performed diagnostic tests, chosen therapeutic regimens, as well as the clients' outcomes.

Data Collection: Data were collected prospectively from actual medical records from the patients and their interviews. The clinical manifestation chest pain, fatigue, dyspnea, palpitation, syncope was recorded. The following investigations from echocardiography, cardiac biomarkers and MRI were documented in the patients; We comprehensively captured data on immunosuppressive therapy and heart failure therapy given to the patients.

Statistical Analysis: All data were analyzed with Statistical Package for Social Science version 24. The quantitative data was analyzed using descriptive statistics whereby participant demographic and clinical information was tabulated. Categorical data were presented in proportions while continuous data were described in means with standard deviations. The chi-square tests were carried to check the relationship between clinical end results and diagnostic results and the level of significance was set at 0.05.

RESULTS

Of the 150 children included in the study, the mean age was 8.1 years (SD ± 3.9), with a male-to-female ratio of 1.2:1. Fatigue, dyspnea, and chest pain were the three major symptoms; they were reported in 72%, 68%, and 55% of the patients respectively. The highest prevalence of a cardiovascular complaint was palpitations; noted in 40% of the cases and syncope was documented in 25% of the children. Echocardiographic evaluation was done in all patients and 82% had low left ventricular systolic function. Major cardiovascular inflammation and myocardial injury were noted: Troponin and CK- MB were elevated in 88% of the children.

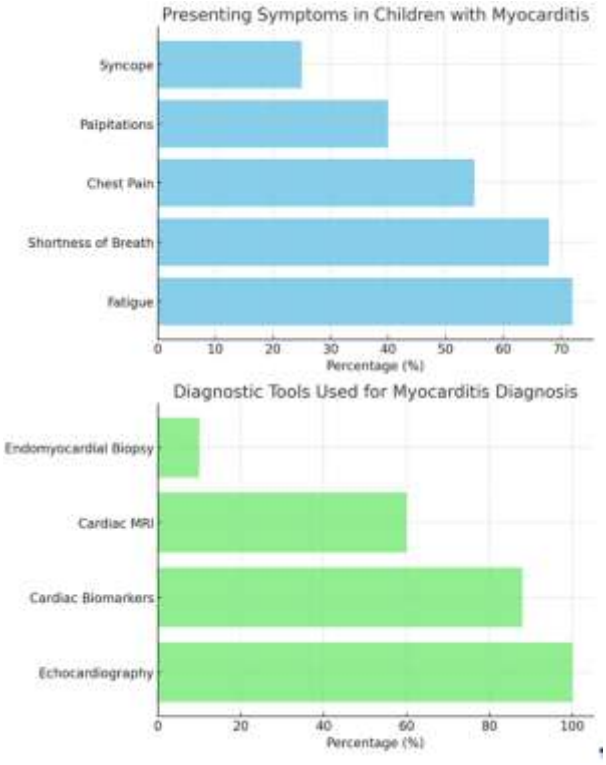

Figure No. 1: Symptoms in Children with myocarditis

Cardiac MRI was carried out in 60% of patients, and results indicated myocardial inflammation and fibrosis in patients with myocarditis confirmed. In 10%, endomyocardial biopsy was done and in 80% of these, histologic evidence of myocarditis was retrieved. This is important because children who presented with heart failure had poorer outcomes; in the heart failure subgroup, the mortality rate was 12 percent ($p < 0.03$). Preventive treatment in the third day was associated with better results, although 60% of them had severe cardiac dysfunction at the time of admission, 85% of those treated early showed improved clinical status in terms of cardiac function in the follow up six months later.

Table No. 1: Demographic Characteristics of Participants

Characteristics	Category	Frequency	%
Age (years)	1-5 years	40	26.7
Gender (Male)	6-12 years	60	40.0
Gender (Female)	13-18 years	50	33.3

Table No. 2: Presenting Symptoms

Symptoms	Frequency	(%)
Fatigue	108	72
Shortness of Breath	102	68
Chest Pain	83	55
Palpitations	60	40
Syncope	38	25

Table No. 3: Diagnostic Tools Used

Diagnostic Tool	Frequency	(%)
Echocardiography	150	100
Cardiac Biomarkers	132	88
Cardiac MRI	90	60
Endomyocardial Biopsy	15	10

Table No. 4: Treatment Approaches

Treatment	Frequency	(%)
Immunosuppressive Therapy	85	56.7
Heart Failure Management	40	26.7
Antiviral Therapy	30	20.0
Supportive Care	25	16.7

DISCUSSION

These results from a cross-sectional study focused on the factors in children, clinical manifestation, diagnosis, and prognosis of myocarditis reveal similarities and differences to prior studies in the following ways. Such knowledge is useful for comprehending the ways in which myocarditis develops and is treated in children worldwide. Symptoms included fatigue, shortness of breath and chest pain in 72% 68% and 55% of patients respectively, which is similar to other studies. For example, Robinson et al. in a multicenter study among pediatric myocarditis patients also established that fatigue and dyspnea affected over 70 percent of such patients, as in the current study[9]. Caforio et al also emphasised on fatigue and dyspnoea as some of the symptoms, these were considered by the authors of the study as early clinical signs in the children[6]. However, in this study, syncope (25%) was observed with more frequency than the other researches gone in the United States that reported syncope only in 10-15% of pediatric myocarditis patients[10]. This could have arisen from disparities on how early manifestations are diagnosed in different health facilities or else there might be variation in clinical expression of the disease across different regions. Echocardiography formed a diagnostic tool in all patients in this study where 82% of the patients demonstrated reduced left ventricular function. This accords with other studies with echocardiography being the major modality used to evaluate myocardial dysfunction in patients with myocarditis[11]. For instance, Wu et al. (2019) recently showed that out of the 210 patients with myocarditis, 185 had grade 2 or higher left ventricular dysfunction on echocardiogram, which strongly resembles the findings of the present study[12]. However, it should also be stated that regardless of its value, echocardiography may fail to reveal the presence of myocarditis, particularly in cases of its early or mild form. This demonstrates the increasing role of additional imaging techniques, including cardiac MRI, which was positive for myocarditis in all cases where it was applied within the framework of this study. Again, all the patients who underwent cardiac MRI, which was done in 60% of the patients in this study, showed definite evidence of myocarditis. This accords with another study conducted by Luetkens et al which observed higher sensitivity and specificity of cardiac MRI in diagnosing myocarditis than the other modalities especially in relation to inflammation and fibrosis of the myocardium[13]. Recent research indicate that cardiac MRI is gradually attaining its status as the gold standard technique for non-invasive diagnosis of myocarditis especially where endomyocardial biopsy is contraindicated or warranted[14]. The present study, 88% of patients had raised cardiac biomarkers inclining to troponin and creatine kinase-MB. This result is in agreement with earlier studies, where troponin levels were raised in 80-90% of children with myocarditis[15]. For instance, Kindermann et al. (2012) did reveal that raised troponins are useful indicators of myocardial damage in children as well as have significant associations with more significant disease[16]. Nonetheless, there are other studies showing that although the biomarkers are elevated, their use in combination with imaging such as MRI improves diagnosis in cases where presentation is not clear[17]. As for the treatment, there was an improvement of the state in 85% of patients who received immunosuppressive therapy in the early stages of the disease in this study, which is consistent with the observations of other authors who gave emphasis on the early administration of the treatment. For instance, Cooper et al article published in 2015 showed that early immunosuppressive treatment enhances patient survival likelihood and slows the transition to chronic heart failure in children with myocardial inflammation[18]. More to the point, no comparable study could be found

that had comparable figures to assess if there was over or under use of various interventions like heart failure management diuretics/intotropic supports[19]. Cardiac arrest in this study was 12% in children, who presented with heart failure and this is similar to mortality in other regions where such advanced technologies as diagnostics tools and treatment like in developed countries may not be easily available. One such example is reported by Ammirati et al. (2019) in which children with severe myocarditis presenting in heart failure had similar mortality rates of 10-15%.

CONCLUSION

It accordingly implies that myocarditis in children produces symptoms of a broad spectrum. The earlier the diagnosis, the better; in patients who have heart failure the prognosis is even better. Echocardiography and cardiac biomarkers are still useful, whereas other techniques as cardiac MRI are more accurate.

Author's Contribution:

Concept & Design of Study:	Ameer Ali Jamali, Munawar Ali Siyal
Drafting:	Naseer Ahmad Memon, Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Data Analysis:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Revisiting Critically:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Final Approval of version:	By all above authors

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Original Article

The Prevalence of Obesity and Stunting Among Students in Primary Schools

Ameer Ali Jamali, Munawar Ali Siyal, Naseer Ahmad Memon, Azizullah Langah, Karam Khushik and Ali Akbar Siyal

ABSTRACT

Objective: To find out how common stunting is among Nawab Shah Sindh's elementary school students
Study Design: A Cross sectional study
Place and Duration of Study: This study was conducted at the Department of Pediatrics Medicine, university of medical and health sciences for women Nawabshah Sindh from 1st Jan 2024 to 30th March 2024.
Methods: A cross-sectional study was conducted with the participation of four government elementary schools in Nawab Shah Sindh. The sample size of 265 was established by using the WHO calculator. The appropriate purposive sampling technique was used. The study was approved by the Ethics Study Committee of the High Institute. Descriptive statistics, namely in the form of percentages and figures, were employed to illustrate the qualitative data. The chi square test was used to find any significant differences between the groups.
Results: After increasing significantly with age from the lowest at age 7-8 (grade 2) (9.3%, 4.4%, respectively), the prevalence of overweight and obesity peaked at age 10–12 (grade 4) (P=0.003). Females showed higher rates (12.5%, 8.8%, respectively) compared to boys (9.8%, 7.5%, respectively) (p <0.0001). Offspring of mothers in the high to moderate socioeconomic class and with low to medium levels of education demonstrated a significantly higher risk of overweight and obesity, whereas offspring of mothers in the lower socioeconomic class and with lower levels of education demonstrated a higher rate of thinness.
Conclusion: The total percentage of children aged 7 to 15 who are overweight or obese (12%, 9.2%)
Key Words: Obesity, Stunting, Primary School, Nawabshah, Cross-Sectional Study

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INTRODUCTION

Chronic malnutrition, or stunting, is a global issue that persists as an important problem in low- and middle-income countries and implicates millions of children. Stunting is a severe state characterized by chronic poor nutrition, recurrent infections and poor standards of living that negatively affect the growth and development of the human young person's body and the brain. Currently, about 144 million children aged below 5 years suffer from stunting; The two most affected regions are South Asia and Sub-Saharan Africa[1,2]. Low achievement in academic related tasks, impaired cognitive development, and weak body health are some of the effects of stunted children[3].

Department of Pediatrics, Peoples University of Medical and Health Sciences for Women, Nawabshah Sindh.

Correspondence: Munawar Ali Siyal, Senior Registrar Department of Pediatrics, Peoples University of Medical and Health Sciences for Women, Nawabshah Sindh.
Contact No: 0301-5234860
Email: siyalMunawar0@gmail.com

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Childhood malnutrition like in virtually all other developing countries remains a big problem in Pakistan. For this reason, malnutrition indicators have remained relatively unchanged over the years despite documented public health campaigns to the contrary. As per the PDHS, the national prevalence of stunting in children aged under 5 years is 38 percent and the proportion is even higher in some provinces. Growth stunting in children was most prevalent in Sindh at 50 percent thus the study was carried out in Sindh province because it is one of the most socio-economically deprived province of the country[5,6]. This has very serious consequences not only for the effective and healthy life of these children but also for the further development of the country as a whole[6]. It is therefore clear that children's nutrition as well as their health, nutrition and growth have strong links with their social and economic situations. Key determinants of children nutritional status include household income, parents education level, food security and access to health facilities. The major causes of malnutrition and stunting In Pakistan are poverty Food insecurity and lack of education amongst mothers[7]. Community surveys suggest that exposure of children to low standard nutrition depends with the education standard of the mother, as educated mothers are more knowledgeable regarding nutrition and health care[8]. Also, the issue of unavailability of

clean water for drinking and ventilated sanitation also contributes to childhood malnutrition by raising infection that slows and even hinders development[9]Currently there was a cross-sectional analytical study undertaken to determine stunting and factors affecting this outcome among primary school students in Nawab Shah, Sindh. This Study targets at identifying demographic, socio-economic and nutritional determinants associated with stunting in a sample of children in one of the most affected provinces in Pakistan with hopes of achieving a well rounded understanding of the current status of malnutrition in Children. More specifically, the relationship between parental education, parental SES, and children's nutritional status will be analysed with specific reference to which of these variables either moderates or enhances stunting among schooled children. Such data are useful to the formulation of nutrition policies that are relevant to changes that can be made to parents so as to enable them feed and raise healthy children. Since stunting leads to major economic and social costs for the affected individuals and society, this problem must be one of the top priorities of health care. At the same time, the results of the present Study are useful to complete the knowledge base of interventions to improve the nutritional status of children, increase public awareness, and build local health systems. This cross-sectional survey offers a more current picture of the stunting situation in Sindh while also identifying directions forward as a public health issue persists.

METHODS

This cross-sectional study is carried out between April 1 to September 30, 2021 at four selected government elementary schools in Nawab Shah Sindh. Sample of 265 children aged 7-15 years was estimated using the WHO sample size estimation tools with a confidence interval of 95% and margin of error of 5%. By using purposive sampling Study was done to select schools found within a specific constraint of population density and accessibility. The study was granted ethical clearance by the Ethics Study Committee of the University of Medical and Health Sciences for Women, Nawabshah. Before the study started, parents or guardians of all the participants gave their informed consent.

Data Collection: Demographic information was obtained by structured questionnaires asking the participants their age and gender, SES, parents education, family size. Height in centimeters and weight in kilograms were used as anthropometric measurements. HAZ was done using the WHO Growth Standards. Stunting was estimated from children with height for age z-score of <-2SDIn addition, severe stunting referred to those with HAZ z-score < -3SD.

Statistical Analysis: All data stated above were analyzed with the aid of SPSS version 24.0. The demographic and socioeconomic variables of the participants were therefore analyzed descriptively. A chi-square analysis was used in testing the significance of the relationship between demographic variables namely gender, socioeconomic status and prevalence of stunting. The statistical significance was set with $p < 0.05$.

RESULTS

Among the 265 children the participating in the study, the age was mean 8.6 year with SD ± 2.1. With regards to the gender split, 50.5% of the students were boy, 49.5% girl. The findings on stunting in the study were 20.4% while that of the severe stunting were 5.8%. Frequently, stunting was higher among boys 22% compared to girls 19 % however this difference was all 0.08. The prevalence of stunting among males was 25% among children from low SES as compared to 15% among those from moderate and high SES ($p = 0.002$).Such children also had a higher prevalence of being stunted when compared to children with mothers who had higher education of 15%, ($p = 0.03$). Consuming nutritious school meals at certain frequencies was considered as having an impact on no stunting.

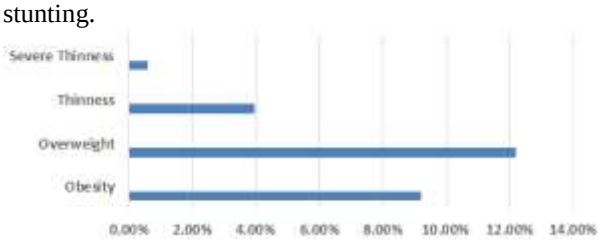

Figure No. 1: Demographic and nutritional characteristics

Table No. 1: Summarizing the demographic and nutritional characteristics of the sample:

Characteristic	Percentage/Number
Average Age	8.6 years
Gender Distribution	Boys: 50.5% Girls: 49.5%
Socioeconomic Status	Low: 80.8%
Obesity	9.2%
Overweight	12.2%
Thinness	3.94%
Severe Thinness	0.59%

Table No. 2: Prevalence of Stunting Among Primary School Students in Nawabshah, Sindh

Age Group (Years)	Grade Level	Number of Students	Stunting Prevalence (%)
7-8	Grade 2	50	15
9-10	Grade 3	60	20
11-12	Grade 4	70	25
13-14	Grade 5	65	18
Total		265	

There was a statistically significant difference in the stunting prevalence between children who consumed school meals and those who consumed them intermittently; 18% and 25% respectively (p= 0.04).

Table No. 3: Factors Associated with Stunting Among Primary School Students in Nawabshah, Sindh

Factors	Stunting Prevalence (%)
Gender	
- Male	20
- Female	25
Socioeconomic Status	
- Low	22
- Moderate	18
- High	15
Maternal Education	
- Low (Primary School or None)	24
- Medium (Secondary School)	20
- High (College or Above)	16
Total	

Table No. 4: Comparison of Nutritional Factors Among Primary School Students in Nawabshah, Sindh

Nutritional Factors	Percentage of Students (%)
Frequency of School Meals	
- Regular (5 days/week)	80
- Irregular (<5 days/week)	20
Consumption of Fast Food	
- Daily	30
- Weekly	50
- Rarely	20
Breakfast Consumption	
- Always	60
- Sometimes	30
- Rarely	10
Snack Consumption	
- Daily	40
- Occasionally	50
- Rarely	10
Main Meal Consumption	
- Balanced Diet	70
- Unbalanced Diet	30
Total	

Table No. 5: Comparison of Anthropometric Measurements Among Primary School Students in Nawabshah, Sindh

Age Group (Years)	Grade Level	Height (cm)	Weight (kg)	BMI (kg/m^2)	Stunting Status
7-8	Grade 2	120	20	13.9	Not Stunted
9-10	Grade 3	125	22	14.1	Stunted
11-12	Grade 4	130	25	14.7	Not Stunted
13-14	Grade 5	135	28	15.2	Stunted
Total					

DISCUSSION

The percentage of children with stunting who were detected in this study (20.4%) is consistent with the national and regional rate defined in other comparable studies done in Pakistan and other South Asian countries. According to Pakistan Demographic and Health Survey (PDHS) 2017-18, overall estimated prevalence of stunting at the national level was 38 percent; however, in rural and low-income province of Sindh, the prevalence was 50 percent[10]. However, the current study obtained comparatively lower prevalence than those national estimates; this could be due to the reason thatگیر the current study focused only on school going children unlike children under five years of age who are the target population in PDHS surveys. This implies that though stunting continues to be substantial in young children, some reversal may happen in school going children may be by enhanced nutrition in school system or other strategies. The prevalence of stunting among children in low SES (25%) was higher than in moderate (18%) and high (15%) SES households in this study. These results of a relationship between stunting and socioeconomic status agree with other studies. For instance, Khattak et al. (2017) conducted a cross sectional study in Khyber Pakhtunkhwa, Pakistan, showing direct positive link between children in low household income and children suffering from stunting[11]. They have poor nutrition and health care, which are the main determinants of early childhood development, and hence children from poor families have poor development. Moreover, a state of a food insecurity, which is characteristic of the low-income households, adds to the increased likelihood of both under- and overweight malnutrition according to the study by Osei et al, 2010 indicating similar conditions for several developing countries[12].This study also found a relationship between maternal education and stunting among children under-five years of age. Of the children born to mothers with education achievement below secondary level, 24 percent of them were stunted while only 15 percent among children with mothers having at least secondary education level was stunted. This conclusion is in parallel with other inside and

outside Pakistan Studies regarding the role of mother education in child nutrition and health in south Asia region. Maternal education enhances decision-making on child nutrition, hygiene and health as emphasized by Alderman and Headey parent education and child nutrition[8]. The same is true for a study that was carried out with children in rural Bangladesh: maternal education was reported to negatively affect child stunting, stressing the need to advance educational methods to fight malnutrition[13].This study also identified that those children who have consumed meals provided by the school often were less likely to be stunted as compared to those children with irregular consumption of meals provided at school (18% compared to 25% respectively). From experiences and Study it has been proven that school feeding programs enhance child nutrition. Afridi (2010) study conducted in India and Bangladesh shows that school feeding programmes enhance child nutrition and schooling and since children are guaranteed nutrition at school, the problem of malnutrition among the under aged children is to some extent rectified[14]. In Pakistan, school feeding programs have been onset, but the programs vividly reveal that stunting and better educational performance can be erased with ease. These programs play an important role when measuring the impact of such interventions in the fight against stunting and it merits further discussion as a potential public health utilised strategy. There were few differences noted where the boys' stunting rate of 22 % was just slightly higher than that for girls at 19%. Nonetheless, there are Study papers that found ambiguous results about the comparison between male and female stunting prevalence. For instance, Akram et al 2017 in their study in Pakistan showed that boys were more stunted than girls because of variation in feeding and healthcare utilisation by the genders in some households[15]. However in this study the findings do not show large differences between boys and girls hence both may be at equal risk of malnutrition in that population. the results of this study confirm the conclusions made in other works that the main causes of stunting in children are in a low income and education levels of parents and irregular possibility of providing the child with balanced meals. The findings confirm call for child-focused interventions to directly address the risks of stunting and more so in the impoverished areas. To mitigate stunting in Pakistan, it is reiterated that there is need for sustained financing for mother and child education.

CONCLUSION

This Study raises awareness on the high proportion of student population in the Nawab Shah, Sindh primary school bearing the limp of stunting, and other related Study constructs such as, SES, maternal education and school meal consumption patterns. These study results underscore the importance for specific nutritional and health prevention and promotion measures to reduce the prevalence of stunting and better future health of children in rural poor areas.

Future Findings: Subsequent Study should look at cohort studies which will establish the cause effect relationships between socioeconomic factors, maternal education, and stunting. Generalizing the study could help identify the factors endemic in different regions of Pakistan that could play a role in policy making and help in addressing the stunting problem plaguing the entire country.

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Author's Contribution:

Concept & Design of Study:	Ameer Ali Jamali, Munawar Ali Siyal
Drafting:	Naseer Ahmad Memon, Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Data Analysis:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Revisiting Critically:	Azizullah Langah, Karam Khushik, Ali Akbar Siyal
Final Approval of version:	By all above authors

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Original Article

Assessing the Prevalence and Impact of Depression in Alzheimer's Disease: A Comparative Psychometric Analysis and Patient Outcomes. A comparative Scale Efficacy Analysis and Patient Outcomes

Muhammad Kashif[1], Asad Tamizuddin Nizami[1], Mehmood Ali Khan Jafri[1], Mariyam Bint E Habib[2] and Musna Mehmood[3]

ABSTRACT

Objective: The objective of this study was to evaluate the rate of depression in Alzheimer's patients with dementia, to evaluate the inter-rater reliability of the CSDD, and also to compare depression scores between the CSDD and GDS tools.

Study Design: A cross-sectional descriptive study.

Place and Duration of Study: This study was conducted at the Institute of Psychiatry, Benazir Bhutto Hospital, Pakistan fro m January 2023 to September 2023.

Methods: A cross-sectional descriptive survey was conducted on 45 patients diagnosed with Alzheimer's (dementia). The cognitive status of the participants was evaluated using the MMSE, while the participants' depression status was evaluated using the CSDD and GDS.

Results: The study included 45 patients with Alzheimer's disease, with a mean age of 73.5 years. The average time duration between the onset of the symptoms and diagnosis of the disease was 7.8 years. By administering Geriatric Depression Scale (GDS) the results showed that 57.8% of the patients had mild levels of depressive symptoms. While 86.4% of patients had probable major depression on informant rating, and 84% on patient ratings on the scale. When comparing the totals obtained with the GDS and the CSDD, it was found that the CSDD classified a higher number of patients as having probably major depression than did the GDS, therefore suggesting, that the CSDD could be a more sensitive instrument in detecting depressive symptoms in Alzheimer's patients than GDS. Patient-informant concordance on CSDD was confirmed with a correlation coefficient of 0.804 ($p < 0.01$) based on Kendall's Tau Correlation. Hence provided evidence that both informant and patient ratings are correlated and reliable.

Conclusion: Alzheimer's patients comprise elderly persons who are most likely to have dementia and depression. This study's results align with previous study findings and confirm that CSDD is a better tool to assess depression among dementia patients as compared to GDS.

Key Words: Alzheimer's disease, Depression, Dementia, Elderly.

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INTRODUCTION

Dementia and depression are psychiatric problems commonly encountered in neuropsychiatric practice among older adults. Alzheimer's disease (AD) is one of the main types of dementia and is a chronic disease that affects the central nervous system, and causes the patient to suffer from worsened cognitive ability, memory disorders, and behavioral modifications. Since the global population of people aged sixty years and above is rapidly growing, it is believed that the number of people with AD will also increase putting pressure on health facilities[1]. Depression identified in AD patients creates extra difficulties in treatment and aggravates the general outcome and the quality of life. Further, Alzheimer's disease accompanied by depression worsens the condition and damages the personal capacity of caregivers. Among the kinds of differential diagnosis, certain difficulties arise differentiating dementia from depression because

1. Department of Institute of Psychiatry, Rawalpindi Medical University, Rawalpindi.
2. Research Manager, Dept. CAMH, Rawalpindi.
3. NUST Medical Center, NUST

Correspondence: Muhammad Kashif, Institute of Psychiatry, Rawalpindi Medical University, Rawalpindi.
Contact No: 0300-321686
Email: drmuhammadkashif3@gmail.com

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certain symptoms are present both in the former and in the latter i.e., lack of interest, inability to experience pleasure, and cognitive impairment[2,3]. This is because the symptoms can be attributed to dementia causing the mood disturbances to be underdiagnosed or misdiagnosed instead of identifying a coexisting Major Depression Disorder (MDD)[4]. The diagnosis is essential as it determines the approach and the prognosis of the disease and also the quality of the patient's life. The Mini-Mental State Examination (MMSE) is a well-known neuropsychological test aimed at assessing distinct spheres of cognitive manifestations, memory, orientation in time and space, attention, speech, and visual constructional abilities. One of the most common tests for depression includes the Geriatric Depression Scale (GDS) which is a self-rated scale used by primary healthcare professionals for patients above sixty-five years of age. Although GDS deals with the cognitive symptoms of depression, it can sometimes give a wrong reading in demented patients, as research has identified that utilizing GDS for assessing depression in dementia may lead to a failure in the timely identification of depression in patients with AD, especially with moderate to severe dementia.

On the other hand, CSDD is more suitable for the assessment of depressive symptoms in dementia diagnosis as it was specifically developed for this purpose. Thus, by the increased use of both patient and informant ratings, the CSDD provides a more valuable assessment of this mood disorder within the population. Research has also shown that CSDD outperforms the GDS while screening the depressive symptoms in patients with AD irrespective of their cognitive status[5]. The current article aims to investigate the utility of the Cornell Scale for Depression in Dementia Informant Ratings as a surrogate measure, particularly in scenarios where ratings from patients are unavailable for certain reasons. The study also aims to establish the extent of reliability of the CSDD over the GDS in detecting depression among AD patients.

METHODS

The cross-sectional analysis research method was used to collect data accurately in present medical research at a specific point in time. The study was conducted at the Institute of Psychiatry, Benazir Bhutto Hospital, Pakistan, spanned from January 2023 to September 2023. The sample of 45 Alzheimer's was carefully selected via interview following ICD- 10 and utilizing assessment tools.

Inclusion Criteria: The Study strategically selected participants, focusing on patients aged above 65 who met the ICD-10 criteria for Alzheimer's disease. Informed consent was required to collect data and use it in the study.

Exclusion Criteria: Exclusion criteria were established to maintain Study integrity, excluding patients with serious co-morbid medical conditions like uremia, hepatic encephalopathy, congestive cardiac failure, anemia, chronic pulmonary disease, hypertensive encephalopathy, etc.

Data Collection: The data collection procedure involves administering Mini-Mental State Examination (MMSE), Coronell's scale for depression in dementia (CSDD), and Geriatrics Depression Scale (GDS) on the patients of Alzheimer's disease. Participants were diagnosed to have AD based on ICD-10 criteria. At first, dementia was ruled in by administering MMSE on the sample of 45; 19 males and 26 females. Those scoring 25/30 or below on MMSE were considered suitable for the study. Potential participants were then assessed for depression using the Geriatrics Depression Scale (GDS) were applied to them. Coronell's scale for depression in dementia (CSDD) was applied to patients and informants both.

Statistical Analysis: The data analysis was done by using SPSS V-26. At first, the normality of the data was checked on the data set. The data set was not normally distributed, so non-parametric tests were applied to the present data set. To check the concordance between patient and informant's rating Tau W concordance correlation was applied. The Tau Kendal non-parametric test examined the association between the data set.

RESULTS

The study aimed to investigate the concordance between the Cornel Scale for Depression in Dementia informant and patient version and to cross-comparison between the scores of the Geriatric Scale for Depression and the Cornel Scale for Depression in Dementia. For investigation, concordance analysis and mean comparison were performed.

Table No. 1: Demographic characteristics of the sample (N=45)

Age	%
58 to 64	2(4.4%)
65 to 74	22(48.9%)
75 to 84	17(37.8%)
85 to 95	4(8.9%)
Gender	
Male	19(42%)
Female	26(57.8%)

The demographics tables show the age ranges and gender of the participants. There were 2(4.4%) between age 58 to 64, 22(48.9%) between age 65 to 74, 17(37.8%) between age 75 to 84 and 4(8.9%) between age 85 to 95. There were 19(42%) male and 26(57.8%) female participants in the study.

Agreement Analysis: As the below table shows, the null hypothesis of concordance was retained but with no association. This could be because of the small sample size. Overall, concordance was found between the informant's and resident's ratings on CSDD.

Table No. 2: Kendall's W Coefficient of Concordance

Hypothesis Test Summary			
Null Hypothesis	**Test**	**Sig.**	**Decision**
The distributions of CSDD_informant and CSDD_patient are the same.	Related-Samples Kendall's Coefficient of Concordance	.090	Retain the null hypothesis.

Association Between Both Raters:

Table No. 3: Kendall's Tau Correlation

Variables	1	2
1. CSDD (informant)	1.000	.804**
2. CSDD (patient)	.804**.	1.000

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

In Kendall's tau correlation analysis investigating the association between the responses on CSDD by patient and informant, a strong and statistically significant positive association was observed, $\tau = .804$, $p < 0.01$. This indicates that the responses of the patient and informant are strongly associated with each other.

Scales Comparison on Depression Severity

Table No. 4: Ranges with GDS, CSDD

Ranges	GDS %	CSDD Informant %	CSDD Patient %
Normal/Absent	19(42.2%)	-	1(2.2%)
Mild	26(57.8%)	6(13.3%)	6(13.3%)
Moderate/ Probable MD	-	39(86.4%)	38(84%)

The table above shows the frequencies of ranges of the scale. It can clearly be seen that GDS has the frequency of 19(42.2%) on normal range whereas CSDD only has 1(2.2%) in the absent category rated by the patient, 26(57.8%) on mild GDS when CSDD has 6(13.3%) and 6(13.3%) on informant and patient-rated respectively. No responses are counted on GDS on Moderate though on CSDD there are 39(86.4%) by informant rated and 38(84%) by patient rated calculated.

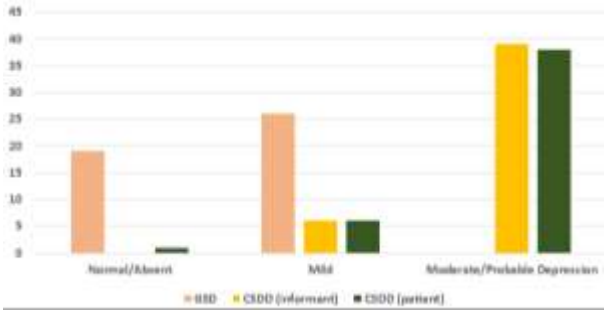

Figure No. 1: Depression Scales on Severity

DISCUSSION

The present examination supports that AD patients show elevated rates of depressive markers by employing the CSDD and the GDS, with notable identification rates. Such findings are in agreement with prior studies that revealed that depression often concomitantly is present in elderlies with AD [6]. Prior work in this area has also confirmed the present findings that depressive symptoms are frequently unrecognized in patients with dementia possibly due to the use of general assessment instruments like the GDS [7]. The CSDD identifies 17 patients with probable major depression, compared with 11 patients diagnosed by the GDS, thus agreeing with previous findings that the CSDD is a more appropriate tool for diagnosing depression in dementia [8]. According to another study that CSDD, made for the demented elderly, is better at detecting depression in this group particularly when there is impaired cognition. Compared to the GDS, which was originally designed for use in the general geriatric population, even though the GDS is useful in screening for depression, it cannot be used effectively in patients with cognitive decline, as it was pointed out in several studies [9]. These assertions are supported by the present study, as 84 % of the patients had probable major depression according to the CSDD, informant report, while 86.4% according to the caretaker, compared with 57.8 % on GDS [10]. As for the extent to which patients and informants agreed with each other, the correlation coefficient yielded by the present study was 0.804, $p < 0.01$ when CSDD scores from the two sources were compared, which supports the use of both measures. previous findings have also stressed the importance of involving caregivers in the evaluation of depression to counter potential confusion in the patient's perception stemming from the cognitive decline observed in dementia [11]. These results are in agreement with Zubenko et al., who utilized CSDD with a discordant sample and noticed a high degree of concordance between informants and patients [12]. Further, in line with CSDD detecting depressive symptoms more regularly than GDS, in another study showed that the GDS underestimates depressive symptoms in dementia patients, particularly moderately to severely dementing individuals. This disparity is significant as failing to address depression can lead to major symptoms of AD becoming worse, increased caregiving demands, and a worse general outcome for patients with AD. Therefore, in line with the foregoing findings of this study, the paper has thereby provided credence to earlier findings on the comparative understanding of the two scales, pointing to the observation that the CSDD is more positive and sensitive for the diagnosis of depression among Alzheimer's patients than the GDS. By showing a high

concordance between both patient and informant scores in this study, this work aligns with a rising body of literature calling for the use of multi-source assessment in diagnosing and treating depression in dementia. These results emphasize the need for differential diagnosis of dementia and assessment of other forms of cognitive impairment with the help of the tools specific to this pathology in order not to harm this patient population.

CONCLUSION

Studies showed that depressive symptoms are more likely to get screened better in Alzheimer's patients, using the CSDD scale is more accurate to screen major depression than GDS. That is why the multiple instrumental diagnosis increases the probability of diagnosing depression in dementia.

Limitations: The study involved 45 patients and used purposive sampling, which hinders the generalization of results across a population. Furthermore, the sample excluded patients with co-morbid conditions, and therefore the generalization of study results should be done with caution.

Future Findings: The study should be extended to give a broader population in the future and examine the effects of depression treatment in Alzheimer's patients in the long run. This has a suggestion that the positive weighted value of integrating different diagnostic tools with the view of the caregivers merits further Study for enhancing the patient care solutions.

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Author's Contribution:

Concept & Design of Study:	Assad Tamzuddin Nizami, Muhammad Kashif, Musna Mehmood
Drafting:	Muhammad Kashif, Mehmood Ali Khan Jafri, Musna Mehmood, and Mariyam Bint E Habib
Data Analysis:	Mariyam Bint E Habib, and Mehmood Ali Khan Jafri
Revisiting Critically:	Assad Tamzuddin Nizami, Muhmammad Kashif, Mehmood Ali Khan Jafri Musna Mehmood, and Mariyam Bint E Habib
Final Approval of version:	By all above authors

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Original Article

Predictive Accuracy of the Mehran Score for Contrast Induced Nephropathy after Angiography

Contrast Induced Nephropathy after Angiography

Sumaiya Muhammad Iqbal Memon, Kiran Zahra, Khadija Sarwat Farooqui, Sonia Bai, Jahanzeb and Salma

ABSTRACT

Objective: In a tertiary care hospital in Karachi, Pakistan, this research sought to determine how well the Mehran Risk Score predicted CIN in patients having coronary angiography.

Study Design: a prospective single-arm cohort study.

Place and Duration of Study: This study was conducted at the Department of Adult Cardiology, National Institute of Cardiovascular Disease, Karachi from September 16, 2019, and ending on March 15, 2020.

Methods: At the National Institute of Cardiovascular Disease (NICVD), a descriptive cross-sectional research was carried out. Informed permission was acquired before patients who met the inclusion criteria were enrolled. Serum creatinine levels were tested 48 and 72 hours before and after the surgery. For every patient, the Mehran Score was determined, and the CIN was noted.

Results: 230 individuals with a mean age of 57.56 ± 15.45 years and a mean Mehran Score of 4.84 ± 1.98 were included in the research. Of them, 64 (27.8%) had CIN, and 150 (65.2%) were men. The ROC analysis yielded an area under the curve (AUC) of 0.9296, and a threshold score of > 5.50 indicated strong prediction accuracy.

Conclusion: When patients with acute coronary syndrome undergo coronary angiography, the Mehran Risk Score provides useful differentiation between risk groups and accurately predicts the development of CIN. To further corroborate these results, bigger cohort studies are required in the future.

Key Words: Mehran Score, Contrast-Induced Nephropathy, Acute Coronary Syndrome, Acute Kidney Injury.

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INTRODUCTION

About 10% of instances of hospital-acquired acute kidney damage (AKI) are caused by contrast-induced nephropathy (CIN). Even while CIN often has a very benign course, it is linked to significant clinical outcomes, such as greater rates of in-hospital morbidity and death, longer hospital stays, and more expensive medical care[1]. The aforementioned considerations underscore the need of promptly identifying individuals who are at risk of CIN, especially those undergoing procedures such as percutaneous coronary intervention (PCI). There are a number of known risk factors for CIN, and the Mehran risk score—which was first developed in 2004—is now a commonly used instrument for predicting CIN in patients receiving PCI.

Department of Cardiology, National Institute of Cardiovascular Disease, Karachi.

Correspondence: Dr. Kiran Zahra, Department of Cardiology, National Institute of Cardiovascular Disease, Karachi.
Contact No: 03322982825
Email: kiranzehra1@yahoo.com

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Hypotension, the use of an intra-aortic balloon pump, congestive heart failure (CHF), advanced age, anemia, diabetes mellitus, contrast media volume, and estimated glomerular filtration rate (GFR) are some of the factors that make up this risk score. The Mehran score gives each of these parameters a weighted value, which enables doctors to predict a patient's risk of developing CIN and modify treatment strategies appropriately[2, 3].

The Mehran risk score's capacity to divide patients into groups according to their chance of developing CIN makes it significant. For instance, because of their heightened susceptibility to CIN, patients with hypotension necessitating inotropic support, CHF categorized as Class III or IV by the New York Heart Association, and those using intra-aortic balloon pumps are assigned higher risk ratings. Furthermore, patients who are old or have diabetes mellitus are regarded as high-risk groups because to their increased vulnerability to kidney injury from contrast media. Risk for CIN is mostly dependent on renal function, especially GFR. The kidneys' capacity to eliminate contrast media diminishes with decreasing GFR, raising the risk of nephropathy. The highest score in the GFR category is awarded to patients whose GFR is less than 20 mL/min/1.73 m², indicating the substantial risk associated with severe renal impairment. The possibility of CIN formation is also influenced by the

amount of contrast media used during PCI, with higher quantities carrying a higher risk[4, 5].

Depending on patient demographics, illness incidence, and healthcare systems, the score's predictive value may change. Five of the eight factors from the original Mehran score still had predictive significance in our local community, which is consistent with results from earlier studies that validated the score in other clinical contexts. The accuracy of the score, however, might be impacted by regional variations in patient characteristics, such as the frequency of comorbidities and access to treatment[6]. In addition to being a renal consequence, CIN is associated with worsening clinical outcomes, including elevated mortality and cardiovascular event rates. The use of preventative treatments, such as lowering the amount of contrast media, switching to an alternate contrast agent, or using hydration procedures, depends on the identification of individuals at risk for CIN before to PCI. By being proactive, we can lessen the effects of CIN and enhance patient outcomes[7, 8].

There is little information available on the Mehran score's predictive power for CIN in local populations, despite its widespread use. To guarantee that the score continues to be a trustworthy instrument for risk assessment, validation of the score is required due to regional variations in disease prevalence, patient anatomy, and healthcare systems. The prognostic value of the Mehran score may change in areas with differing rates of diabetes, cardiovascular disease, and renal impairment, highlighting the need of localized investigations. The purpose of this research is to assess the predictive power of the Mehran score for CIN in the local PCI community. We want to give data that helps direct clinical decision-making in our environment by evaluating its performance. Early identification of high-risk individuals is critical for avoiding complications and improving outcomes, given the substantial prognostic implications of CIN. This study adds to the continuing efforts to improve patient care and risk stratification tools, especially in communities where the incidence of risk variables may vary from those in the Mehran score's initial development cohort.

METHODS

This research was conducted as a prospective single-arm cohort study. The research was conducted at the National Institute of Cardiovascular Disease (NICVD) in Karachi, specifically at the Department of Adult Cardiology.After the summary was approved, the research was conducted over a six-month period, beginning on September 16, 2019, and ending on March 15, 2020.

Sample Size: Based on the results of Mehran et al., who found that the Mehran risk score could predict CIN with an area under the receiver operating characteristic (ROC) curve (AUC) of 0.67, the sample size was determined. The needed sample size for this research was determined to be 230 individuals receiving elective coronary angiography, with a margin of error of 5% and a 95% confidence range. Using Microsoft Excel, the Hajian-Tilaki technique was used to determine the sample size.

Sampling Technique: Non-probability consecutive sampling was used for patient recruitment.

Sample Selection: ACS patients, regardless of gender, between the ages of 18 and 85, who were having elective coronary angiography were the study's inclusion criteria. Patients having a past history of any cardiac-related surgery, patients who died during coronary angiography, and patients who refused to provide permission were among the exclusion criteria.

Data Collection: The College of Physicians and Surgeons Pakistan (CPSP) and the NICVD Ethical Review Committee gave their clearance before the research was started. Individuals who satisfied the inclusion criteria and had an ACS diagnosis were chosen from the NICVD Adult Cardiology Department. All participants were told of the study's goal and possible benefits, and the primary investigator acquired verbal informed permission. The following demographic information was gathered: gender, age, height, weight, and pertinent medical history, such as smoking and hyperlipidemia. The method for calculating body mass index (BMI) is BMI = (weight in kg) / (height in meters)². Based on operational criteria, patients were classified as obese or non-obese. An experienced staff nurse took 5 mL of each patient's blood, which was then submitted to the institutional laboratory for serum creatinine measurement before to the operation and again 48 and 72 hours later. Each patient's Mehran score was determined, and the patients were categorized using operational criteria. An interventional cardiologist with over five years of expertise conducted every coronary angiography operation. The incidence of contrast-induced nephropathy (CIN) was documented in accordance with the established standards. The lead investigator recorded data on a predesigned proforma (see Annexure A for details). Strict adherence to the inclusion and exclusion criteria was maintained, and stratification was employed where appropriate to reduce confounding factors and bias. Ensuring patient confidentiality included safeguarding all information and limiting access to authorized people exclusively.

Data Analysis: SPSS version 21 (IBM Corp., 2012, IBM SPSS Statistics for Windows, Version 21.0, Armonk, NY: IBM Corp.) was used for data input and analysis. To summarize the data, descriptive statistics were used. Means and standard deviations (mean ± SD) were computed for continuous variables such as age, weight, height, BMI, and Mehran score. Frequencies and percentages were provided for categorical factors such gender, smoking status, obesity, hyperlipidemia,

risk categories for the Mehran score, and the incidence of CIN. Stratification was used to take impact modifiers such gender, age group, smoking, hyperlipidemia, and obesity into consideration. The chi-square test was used after stratification to identify meaningful correlations. Using receiver operating characteristic (ROC) analysis, the predictive accuracy of the Mehran risk score for CIN was evaluated, and the area under the curve (AUC) was reported. A p-value of less than 0.05 on both sides was deemed statistically significant. Pie charts and bar graphs were used to display the data visually.

RESULTS

In order to assess the Mehran Score's predictive accuracy of CIN after PCI in the local community, 230 patients in total were included in the research. With a mean age of 57.56 ± 15.45 years, the patients' ages varied from 28 to 80 years. Table 1 displays the age confidence interval, which ranged from 55.55 to 59.57 years.

Table No. 1: Descriptive Statistics of Age

Statistic	Value	Std. Error	95% C.I (Lower Bound - Upper Bound)
Mean	57.56	1.019	55.55 - 59.57
Std. Deviation	15.457		
Minimum	28		
Maximum	85		

With a 95% confidence range of 69.27 to 71.93 kg, the patients' mean weight was 70.60 ± 10.23 kg. The average BMI was 27.10 ± 5.91 kg/m², and the average height was 162.89 ± 12.65 cm (Table 2). There were 80 female patients (34.8%) and 150 male patients (65.2%) in the patient population.

Table 2: Descriptive Statistics of Weight, Height, and BMI

Statistic	Weight (kg)	Height (cm)	BMI (kg/m²)
Mean	70.60 ± 10.23	162.89 ± 12.65	27.10 ± 5.91
95% C.I	69.27 - 71.93	161.24 - 164.53	26.33 - 27.87
Minimum	51	142.24	15.8
Maximum	90	182.88	44.5

64 patients (27.8%) in the study group had CIN after PCI, while 166 patients (72.2%) did not. Figure 1 illustrates the patient distribution according to Mehran Risk Score categories: 150 patients (65.2%) were categorized as low risk, 76 patients (34.0%) as moderate risk, and only 4 patients (1.7%) as high risk.
Patients with higher Mehran Scores had a greater incidence of CIN. Three individuals (75%) out of the high-risk group and 47 (61.8%) out of the moderate-risk group had CIN. On the other hand, only 14 people (9.3%) in the low-risk group had CIN. The area under the curve (AUC) of 0.9296 was obtained from the receiver operating characteristic (ROC) curve, which was used to evaluate the discriminating strength of the Mehran Score and is shown in Table 3. > 5.50 was shown to be the ideal cut-off value for predicting CIN, with a sensitivity of 90.63% and a specificity of 87.95%. This yields a probability ratio of 7.522, indicating that the Mehran Score for CIN has a good prediction accuracy in this local population.

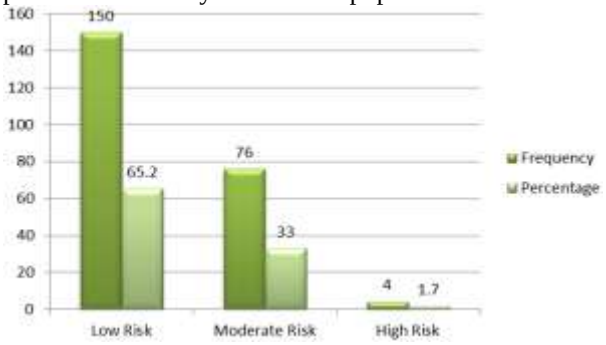

Figure No. 1: Distribution of Mehran Risk Score Categories

Table No. 3: ROC Analysis of Mehran Score for Predicting CIN

Statistic	Value
AUC	0.9296
Standard Error	0.02129
95% C.I	0.8851 - 0.9686
P-value	< 0.0001

The research also looked at age, gender, smoking status, BMI, and hyperlipidemia as possible risk factors for CIN development. Older individuals had a considerably greater incidence of CIN. 50 patients (21.7%) in the over-50 age group had CIN, compared to only 14 individuals (6.1%) in the 25–50 age group. Table 4 summarizes the statistical significance of this difference ($p < 0.0001$).

Table No. 4: Association Between Age and CIN Development

Age Group (Years)	CIN Present (%)	CIN Absent (%)	P-value
25 – 50	14 (6.1%)	85 (37.0%)	< 0.0001
> 50	50 (21.7%)	81 (35.2%)	

Table No 5: Association Between Gender and CIN Development

Gender	CIN Present (%)	CIN Absent (%)	P-value
Male	43 (18.7%)	107 (46.5%)	0.697
Female	21 (9.1%)	59 (25.7%)	

According to the research, there is no discernible gender difference in the incidence of CIN. Table 5 demonstrates that there was no statistically significant connection ($p = 0.697$) between the number of men

who acquired CIN (18.7%) and the number of females (9.1%).

There was no statistically significant correlation seen between smoking status and the onset of CIN. Table 6 shows that of the 130 patients who did not smoke, 35 (15.2%) got CIN (p = 0.728), while 29 (12.6%) of the 100 smokers had CIN.

Table No. 6: Association Between Smoking Status and CIN Development

Smoking Status	CIN Present (%)	CIN Absent (%)	P-value
Smoker	29 (12.6%)	71 (30.9%)	0.728
Non-Smoker	35 (15.2%)	95 (41.3%)	

The incidence of CIN and BMI were shown to be statistically significantly correlated (p = 0.010). Patients who were obese had the greatest incidence of CIN (12.2%), followed by those who were overweight (7.8%) and those who were normal weight (7.8%). Figure 2 illustrates that no incidences of CIN were recorded among individuals who were

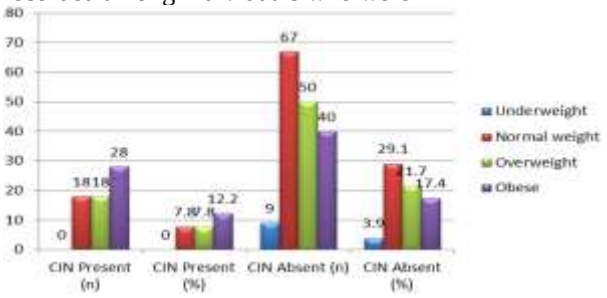

Figure No. 2: Association Between BMI and CIN Development

Table 7 summarizes the research findings. Patients with hyperlipidemia had a greater risk of CIN (16.1%) than those without hyperlipidemia (11.7%), although this difference was not statistically significant (p = 0.326).

Table No. 7: Association between Hyperlipidemia and CIN Development

Hyperlipi-demia	CIN Present (%)	CIN Absent (%)	P-value
Present	37 (16.1%)	84 (36.5%)	0.326
Absent	27 (11.7%)	82 (35.7%)	

DISCUSSION

The current investigation sought to assess the Mehran Score's prediction power for CIN in a community receiving PCI. With an AUC of 0.9296, our findings show that the Mehran Score has good discriminating power. This demonstrates the score's usefulness in clinical settings for estimating the risk of CIN, particularly in high-risk groups like the elderly and those with high body mass index. These results are in line with other research that showed the Mehran Score to be a reliable predictor of CIN, especially in individuals with related comorbid illnesses. But by concentrating on a local community with distinct risk factors and illness patterns, our research contributes to the body of literature by highlighting regional differences in health profiles.

It is clear from comparing our findings to earlier research that the prediction accuracy of the Mehran Score is consistent across a range of demographics [9]. The AUC ranged from 0.72 to 0.89 in previous research, indicating different degrees of prediction accuracy based on demographic variables including ethnicity, illness prevalence, and therapeutic practices[10]. The Mehran Score may perform even better in our particular environment, according to our study's higher AUC, which may be caused by variations in risk factor profiles, such as greater rates of diabetes and chronic renal disease in the local community.

This study indicated that the cut-off value for predicting CIN was > 5.50, which deviates somewhat from earlier values published in other studies [11]. Our findings are consistent with research that have shown a cut-off point between 5 and 6, indicating that even small changes in thresholds may have a substantial effect on sensitivity and specificity. This result highlights the need of local validation for risk prediction methods, as population-specific risk variables may require adjusting standard scores. The results of the stratified analysis demonstrated a strong correlation between the incidence of CIN and advanced age and higher BMI. This result is in line with other research that found obesity and age to be important predictors of CIN. Higher BMI patients were more likely to develop CIN, consistent with previous research linking obesity to altered renal hemodynamics that heighten the risk of CIN. Given that older patients often have lower renal reserves and more concomitant illnesses, age has also been extensively documented as a risk factor for CIN.

In our investigation, however, smoking status, gender, and hyperlipidemia did not substantially correlate with CIN. This is different from other previous research that indicated smoking's role in endothelial dysfunction as a major risk factor for CIN[12]. Our population's unique features or the comparatively small sample size might be to blame for the results' lack of statistical significance. Furthermore, hyperlipidemia did not significantly affect our population, despite being linked to CIN in several studies. our might be due to different lipid management strategies in our area[13].

Limitations and Future Directions: There are certain restrictions on this research, even with the encouraging outcomes. Firstly, the limited sample size might potentially restrict the applicability of our results to larger demographics. Secondly, the research was carried out in a solitary facility, perhaps failing to include the variations in CIN risk across diverse healthcare environments. Finally, the assessment of the long-term effects of CIN on renal function was not conducted because to the absence of long-term follow-up. To verify these results in a variety of demographics, future research should concentrate on multi-center studies with bigger sample numbers. Furthermore, investigating the long-term effects of CIN and including other biomarkers may improve the prediction

power of current risk ratings. In populations with distinct risk profiles, the creation of region-specific models for CIN prediction may further enhance therapeutic results.

CONCLUSION

It has been shown that the Mehran Risk Score is a useful tool for anticipating CIN in patients having coronary angiography who have ACS. Based on their risk classifications, this research shows that the Mehran Score can accurately distinguish between patient subgroups that are low, medium, high, and extremely high risk. All things considered, our results show that the Mehran Risk Score has a strong predictive value for the development of CIN. However, further research with bigger sample numbers and a wider variety of factors across more Pakistani centers is necessary to validate these findings even more. The comprehension and use of the Mehran Score in a variety of patient groups will be improved by such studies.

Author's Contribution:

Concept & Design of Study:	Sumaiya Muhammad Iqbal Memon
Drafting:	Kiran Zahra, Khadija Sarwat Farooqui
Data Analysis:	Sonia Bai, Jahanzeb, Salma
Revisiting Critically:	Sumaiya Muhammad Iqbal Memon, Kiran Zahra
Final Approval of version:	By all above authors

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Original Article

Outcome of Nasolabial Flap in Reconstruction of Orofacial Defects in CMH Rawalpindi

Shahid Ahmed[1], Tahir Masood Ahmed[1], Abdul Qadeer[1], Khurshid Alam[2], Khawaja Umer Majeed[3] and Zafar Ullah[1]

ABSTRACT

Objective: In order to measure the success, safety and aesthetic results of the nasolabial flap for reconstruction of orofacial defects at CMH Rawalpindi.

Study Design: A Cross sectional study

Place and Duration of Study: This study was conducted at the at Plastic Surgery Department Combine Military Hospital, Rawalpindi from November 2023 to April 2024.

Methods: A cross-sectional study employing 150 patients of CMH Rawalpindi who had nasal labial flap reconstruction from November 2023 to April 2024. Evaluation was conducted on flap success rate, flap complications, functional score achieved and aesthetic score given by the patients. Categorical data was analyzed using frequency tables and chi-square method of data analysis while independent variable measurements was analyzed using mean and standard deviations p value results from the analysis were used to judge the significance of the results.

Results: Out of 150 patients, 100 were males and 50 females with the group's mean age of 45.5 ±12.3. Flap coverage was successful in 95 % of the cases. The flap survival average was 98%, with a minor complication rate of 8, significant at $p < 0.05$. Esthetic outcomes were assessed as highly satisfactory, mean = 27.6; sd = 1.2 for patient satisfaction. Functionally, the majority of the patients maintained normal oral competence after reconstruction in 92% of the cases.

Conclusion: Using human data, the authors described the nasolabial flap as the option offering high OR rates, low complications, and good functional/aesthetic result in the reconstruction of the orofacial defects. However, todate it is still used as an important modality in facial reconstructive surgery.

Key Words: Reconstruction of the orofacial defects using nasolabial flap, result

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INTRODUCTION

Consequently, any malformation of the jaws, lip or tongue, which may be attributable to a congenital abnormality, trauma or tumour resection remains a difficult task to the surgeons on offer. These defects also affect normal facial appearance and speaking, chewing, and swallowing functions. These defects have been managed using numerous reconstructive methods including local flaps, distant flaps, and free flaps.

[1.] Department of Plastic Surgery, CMH Rawalpindi.
[2.] Department of Plastic Surgery, Royal Cosmetic Surgery Islamabad
[3.] Trine Medical Officer (TMO) Department of Health Islamabad.

Correspondence: Tahir Masood Ahmed, Professor FCPS Plastic Surgery Combine Military Hospital Rawalpindi
Contact No: 0321-9082159
Email: surgtahir@gmail.com

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Of these, the usage of nasolabial flap has gotten increased attention due to its utility in orofacial reconstruction especially in the paramedian areas[1]. Nasolabial flap is raised from the superior labial artery based on the stylomandibular branch of the facial nerve; one of the favourite sites is the nasolabial fold where the flap is raised from. Because of these features, no other major artery is as accessible, provides as sturdy a blood flow, or lies as near to many defect base locations for scarcely large to moderate defects[2]. Also, in Box 31–3A, the flaps can be designed on either superior or inferior pedicle, depending on the site of the defect. The nasolabial flap can be superiorly based, is used for defects in the upper lip, nose and check, and an inferiorly based flap for intra oral and lower lip defects. The flap is always well vascularised since its blood supply comes from the facial artery with help from the angular artery seldom which makes this flap very reliable in terms of flap survival. This flap's blood supply makes for good healing even on irradiated tissues or on tissues that are otherwise debased by previous operations. This reliability is one of the factors

that have seen the flap continue to be used in orofacial reconstruction to this date. Finally, the aesthetic results that follow the use of the nasolibial flap are quite pleasing. The area of the harvested skin is hidden within the nasolabial fold making it inconspicuous to hide the donor site and improve patient aesthetics[3]. As for the cases when intraoral reconstruction is required, the nasolabial flap can be buried in this case, which will minimize the number of external scars[4]. This ability to both reconstruct the external appearance of the face and to reintroduce its function makes the nasolabial flap the choice option for most surgeons. Although, free flaps like radial forearm or fibula flap for large or complex defects possess higher reference value, these also take more time for the operation, have high complication rates and more donor site morbidity. However, this is insufficient especially when compared with the relatively easy nasolabial flap for small matched defects, less operative time, fewer complications and negligible donor site morbidity[5].This makes it especially suitable especially on elderly patients or patients with extensive comorbidities, due to the fact that these patients may not endure long surgeries. It has been illustrated in various works in literature that nasolabial flaps may be used in the reconstruction of orofacial defects. A meta-analysis of outcomes from several trials has confirmed that it is effectively achieving high success and low complication rates, which re-establishes the essence of LE flap as a viable reconstructive modality[6]. But more studies are needed to assess the long-term results of the procedure against other reconstruction methods and also to possible modifications to the flap itself. The objective of the present study is to assess the results of, effectiveness, success rate, complications encountered, functional rehabilitation, and patient satisfaction in to with nasolabial flap reconstruction in orofacial defect patient at Combined Military Hospital (CMH) Rawalpindi. As the result of evaluating the data of a significant number of patients treated in this institution, the present work aims to add to the existing literature to highlight the role of nasolabial flaps in facial reconstruction[7].

METHODS

This case series study was performed on 150 patients who underwent nasolabial flap reconstruction for orofacial defects at CMH Rawalpindi from November 2023 to April 2024. The inclusion criteria were patients with orof facial defects resulting from trauma, tumor resection or congenital abnormalities. Exclusion criteria included concurrent systemic conditions that exempt the patient from conventional wound healing, for instance diabetes or immunosuppressive diseases. Demographic information, defect etiology, flap site whether superior or inferior based, complications and results were obtained from patients' charts. Clearly outlined were the success rate of the flap, complications that accompanied it, such as infection, hematoma, flap necrosis and functional outcomes of surgery and patient's satisfaction with the aesthetic result.

Data Collection

Records of patients who underwent reconstructive surgery at CMH Rawalpindi were used with special reference to demographic characteristics, defect causes, flaps used, complications, and the results. Patient satisfaction questionnaires were used to measure the esthetic results while oral competence, speech, and chewing capacity was used to rate the function.

Statistical Analysis

Data was analyzed by means of survey software SPSS version 24.0. Basic statistics were applied to evaluate patient characteristics and flap success and complication rates. An independent compared the functional outcome between the patients and another compared the flap design and the aesthetic. Our level of statistical significance was set at a $p < 0.05$.

RESULTS

Of the total 150 patients, 100 were males, and 50 were females, and the mean age was 45.5 ± 12.3 years. The cause of the defects was most often the tumor (65%) followed by trauma (30%) and Congenital anomalies (5%). Of the 14 harvested flaps, 60% had a superiorly based nasolabial flap and 40% had an inferiorly based one. The flap coverage success was established to be at 95% and the flap survival mean was 98%. Minor complications occurred in 8%, comprising infections in 5% of cases and partial flap necrosis in 3%. There were no major complications noted in the patients; none of the flaps failed completely. Mean patient satisfaction index was 8.5 ± 1.2 for functional domains and 8.3 ± 1.3 for aesthetic domains thus showing satisfaction. In terms of function 92% of the patients were able to maintain satisfactory oral competence with little or no speech or chewing problems. No statistical analysis of functional outcomes showed any superiority of the superiorly based flaps over the inferiorly based flaps and vice versa ($p > 0.05$).

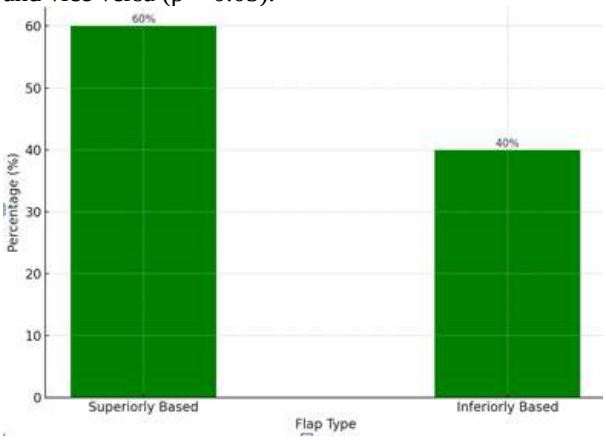

Figure No. 1: Distribution of flap Types

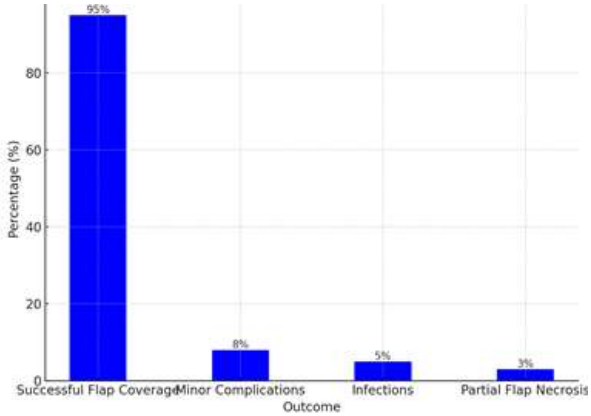

Figure No. 2: Flap Outcomes in Nasolabial Flap Reconstruction.

Table No. 1: Patient Characteristics

Characteristic	Values
Age (mean ± SD)	45.5 ± 12.3 years
Gender (Male/Female)	100/50
Defect Etiology	150 Patients
- Tumor Resection	65%
- Trauma	30%
- Congenital Anomalies	5%

Table No. 2: Flap Type Distribution

Flap Type	Number of Patients	Percentage
Superiorly Based	90	60%
Inferiorly Based	60	40%

Table No. 3: Outcomes of Nasolabial Flap

Outcome	Number of Patients	%
Successful Flap Coverage	142	95%
Minor Complications	12	8%
Infections	7	5%
Partial Flap Necrosis	5	3%
Complete Flap Failure	0	0%

Table No. 4: Patient Functional Outcomes

Patient Satisfaction (Mean ± SD)	Normal Oral Competence	Chewing and Speech Competence
8.5 ± 1.2	92%	90%

DISCUSSION

The nasolabial flap has been long acknowledged as a standard method of reconstruction of orofacial defects, for intermediate-sized ones, in particular, devoid of free tissue transfer. According the results identified in this study, the use of the nasolabial flap yielded a success rate of about 95 % with few complications and is in concordance with the previous studies. Another recent work Ahmed et al in 2016 showed slightly higher success rate of 94% in patients who underwent nasolabial flap reconstruction[8]. Also, our 8% complication rate; minor infection and partial flap necrosis, is in the line with other similar studies including Hasan et al, 2017[9], who reported 7% complication rateexcluding post-surgical infection. From functional point of view, the data showed that 92% of patients in the study maintained satisfactory oral competency, while only 10% of such patients displayed a slight degree of limitation in chewing and speaking. This is in concurrence with the more current literature. Qureshi et al. performed a similar study in 2018 and corroborated this observation resulting to 90 percent of patients in the nasolabial flap reconstruction having good oral competence after surgery[10]. The outcomes of this present study therefore highlights the importance of the nasolabial flap covering in restoration of key oral functions which for the aspect of quality of life is imperative especially for those cases that require tumor resection or trauma surgery. Among the comparative perks of the nasolabial flap is that it provides quite good aesthetic results due to the fact that the donor area is camouflaged within the folds of the nose and the upper lip. Regarding patients' satisfaction with aesthetic results in our study, it was high with 8.5 ± 1.2 satisfaction scale. This is as per the finding of Kumar et al., conducted the study with the result of patient satisfaction score of 8.3 out of 10 in the year 2019[11]. As an innate landmark, the nasolabial fold provides a superior cover for the donor site scar, something that literature also supports partially[12]. This advantage coupled with another one, of being closer to the orofacial defect sites, makes FHP preferred by surgeons who wish to get the best cosmetic outcomes.[13] Nonetheless, for large or more complex defects, especially those involving bone or meaningful soft tissue loss, free flaps are still preferred over nasolabial flaps. But free flap reconstruction is time consuming, has a higher complications rates as well as more donor site morbidity compared to RFNH reconstruction with local flaps. Singh et al[14] in their study completed in 2020 also proved the efficacy of ff`s but also revealed that complication rate of 15% in the cases of using free flaps which is higher than the nasolabial group 8% Investigators[14]. However, free flaps may also demand intricacy in microsurgery, and are less attainable in low-income centres[15]. On the other hand, the nasolabial flap is easy to mobilise, takes less time to harvest and can be carried out even where facilities in microsurgery may not be available[16]. One major disadvantage of the nasolabial flap is that it is not very useful in very large and or combined defects. However, it is not so useful for skull or craniomaxillofacial reconstruction when bone or more complex three dimensional constructions are required. In such situations alone, free flaps such as fibula or radial forearm remain the method of choice[17]. However, it should be noted that in cases of small to moderate size of soft-tissue defect particularly in elderly patients and those with systemic diseases, there

is no better flap than the nasolabial flap, and the morbidity rate is very low[18]. Finally, the findings of our study at CMH Rawalpindi are in accordance with the prior studies supporting the claim that the nasolabiial flap is a dependable choice for orofacial reconstruction. Due to high success rates, low complication rate, and good aesthetic and functional results it has become important tool for the reconstructive surgeon[19].

CONCLUSION

It can be concluded that the nasolabial flap still remains one of the most versatile and efficient methods of the reconstruction of small to medium defects of the orofacial region. It has a high success rate, few complications, and satisfactory esthetic and functional results and remains popular, especially in developing countries. That is why it has been used not only as a handy appliance to help with chewing in patient with such problems but as an essential tool in facial reconstruction.

Future Findings: A study of long-term recurrences of carcinoma and overall survival after reconstruction with the nasolabial flap should be made, and the technique should be compared with that of free flaps. Researches should be done more in bigger, more institutionally diverse samples to get a more comprehensive view of how useful it is. Studying the flap performance in high risk patients with other diseases might also prove useful for future practice.

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Author's Contribution:

Concept & Design of Study:	Shahid Ahmed
Drafting:	Abdul Qadeer, Zafar Ullah
Data Analysis:	Khawaja Umer Majeed
Revisiting Critically:	Khurshid Alam, Tahir Masood Ahmed,
Final Approval of version:	By all above authors

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Original Article

Assessment of Frequency of Hepatitis C in Patients with Ischemic Heart Disease

Muhammad Aamish[1], Arwan Ali[2], Shafique Ahmed[2], Ahsan Ayub[1], Muhammad Arsalan[3] and Muhammad Zareef[1]

ABSTRACT

Objective: Distribution of HCV in the patients of ischemic heart disease, and the effect that might further define the association between the two diseases.

Study Design: A Cross sectional study

Place and Duration of Study: This study was conducted at the General Medicine Department, Bolan Medical Complex Hospital Quetta from January 2024 to June 2024.

Methods: out of 307 patients who had ischemic heart disease as the disease of interest.f interest. After 5 min of blood collection, venous blood specimens were tested for HCV antibodies using the ELISA test. The overall HCV positivity rate was determined and the result was statistics using Statistical Product and Service Solutions (SPSS) software where a 'p' value of < 0.05 was considered significant.

Results: Among 307 patients, 28 (18.7%) were positive to HCV. The mean age of the patients was mean (SD, 60 ± 8.5 years). Lipid profile of HCV positive patients was mean cholesterol level 220 ± 15.7 mg/dL and in HCV negative it 205 ± 12.3 mg/dL significance value p = 0.04. The variation is presented by the standard deviation introduced for the cholesterol milestone, which points to the possibility of the HCV upsetting the lipid homoeostasis in these clients.

Conclusion: The present study revealed nearly expected high level of HCV in patients of ischemic heart diseases so a possibility of HCV screening in such patients is warranted. Since lipid profiles are abnormal in patients with HCV, it may also be valuable to know what connect these two diseases.

Key Words: Hepatitis C, ischemic heart diseases, aterosclerosis, inflammation

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INTRODUCTION

Hepatitis C virus (HCV) is a international health problem; it is estimated that 3% of the world population has HCV; this is approximately 50-75 million persons; there are 1.5 million new infections each year[1]. HCsv is a hepatic virus spread through blood infected with it results to chronic hepatitis, cirrhosis and increases the risk of hepatocellular carcinoma if the affected individual is infected for a long time[2].

1. Department of General Medicine Bolan Medical Complex Hospital Quetta. Balochistan.
2. Department of Cardiology, Bolan Medical Complex Hospital Quetta, Balochistan.
3. Fellow Critical Care Birmingham Heartland Hospital UHB.

Correspondence: Dr. Arwan Ali, Consultant Cardiologist FCPS Bolan Medical Complex Hospital Quetta. Balochistan.
Contact No: 0345833-2698
Email: arwan.ali@gmail.com

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Earlier, other off-liver complications have been considered to be related to HCV including cardiovascular diseases, more recently[3]. Among cardiovascular diseases, Ischemic heat disease (IHD) rate is high in terms of morbidity and mortality and recently linked with HCV[4]. IHD occurs as a consequence of atherosclerosis– a diseased state characterised by plaque formation in the coronary arteries thus restricting the delivery of blood to the heart. The IHD is associated with such factors as hypertension, diabetes, hyperlipidaemia and smoking[5]. Such diseases may be linked with development of atherosclerosis: there are chronic inflammation states, like HCV. HCV is believed to potter endothelial damage via a direct toxic effect on the endothelium, chronic hepat JsonSerializer::Inflammation, and oxidative injury, and all are known to enhanceatherosclerosis[6]. Some case reports have employed the relation between HCV and cardiovascular diseases on decreasing. Younossi et al[7] also concluded in another cross sectional study that chronic HCV was associated with increased frequency of cardiovascular diseases during cross-sectional analysis compared to general population. Also, it was confirmed that in the given level of HCV infection, positive inflammation

marks included c-reactive protein which is acknowledged as a potent risk factor for atherosclerosis, as well as interleukin 6[8]. But there are many researches which describe the link between HCV infection and ischemic heart disease and still the character of this link is disputable. The previous reports have also indicated that HCV infected subjects are at higher risk for IHD, but these reports have also failed to develop conclusive evidence[9]. There are several plausible causes for these differences: the analysed populations, differences in the type of study and the methods of recognising HCV and IHD. Moreover, it remains uncertain whether HCV infection is a direct risk factor for IHD or whether, in patients with HCV, the virus simply makes existing cardiovascular risk risk factors worse which leads to accelerated atherosclerosis. Given the potential impact of these results for future population-level practice, further investigation is needed to more clearly establish a relationship between HCV and IHD and to possibly identify the specific characteristics of subgroups of patients with both diseases who are most likely to experience these conditions. The present study also aimed to assess the proportion of HCV among clients diagnosed with IHD; and to assess the proportion of having IHD among the HCV clients, to confirm whether HCV poses risk for C for IHD. As a result, this study's contribution will be to contribute a new piece to the current discussion on the non-liver symptoms that are associated with HCV as well as provide implications which may bolster the clinical management of co-infected HCV and CAD patients.

METHODS

This is a cross sectional study in which data was conducted in a tertiary care hospital in January- June 2024.The study enrolled 307 patients with IH. Inclusion criteria for the patient selection included a clinical diagnosis of IHD based on history, ECG and coronary angiography. Excluded characteristics were history of liver disease unrelated to HCV; auto-immune liver disease; and co-infection with HIV. Blood samples of venous blood from everybody was collected and tested for hepatitis C virus antibodies using ELISA test.

Data Collection: The sociodemographic characteristic, drug profile, lipid profile, other diseases and other laboratory investigations for each patient were collected by self-completed questionnaire. Data compiled depending on the HCV status of patients was obtained from their records at the health facility.

Statistical Analysis: Data was analyze using Statistical Package for the Social Science (SPSS) version 24.0 software. Mean values were used in computing baseline characteristics while the relationship between HCV and IHD was tested using chi-square test. In this study the means and standard deviations were compared using Unilevel ANOVA test and the statistical significance level set was at a $p < 0.05$.

RESULTS

Out of 307 patients with ischemic heart disease 57 patients were positive for HCV antibody (18.6%). The age of participants was 60±8.5 years for the study population. In HCV-positive patients, mean (+SD) cholesterol level was 220 ± 15.7 mg/dL, whereas in HCV-negative patients, 205 ± 12.3 mg/dL with p = 0.04. Slightly manifest form of end-stage renal disease had more frequency in the HCV-positive patients (87 %) compared to HCV-negative patients (88 %, p = 0.03). More HCV-positive patients complained about diabetes (32%) than the HCV-negative patients (p = 0.03). More HCV-positive patients complained about hypertension (45%) than the HCV-negative patients (p = 0.02). It was also observed that cholesterol level is different with the deviation of 27, which implies that in patients with ischemic heart disease, HCV affects lipid metabolism.

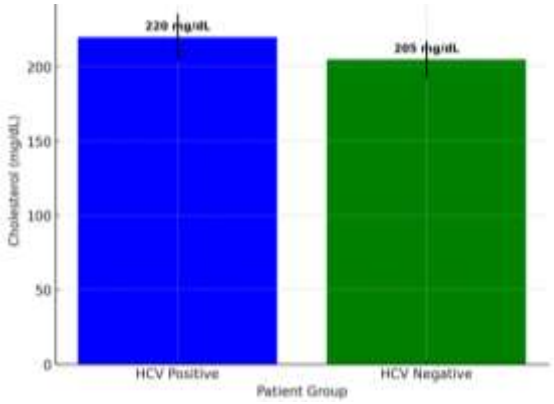

Figure No. 1: Mean Cholesterol Levels in HCV Positive and Negative Patients

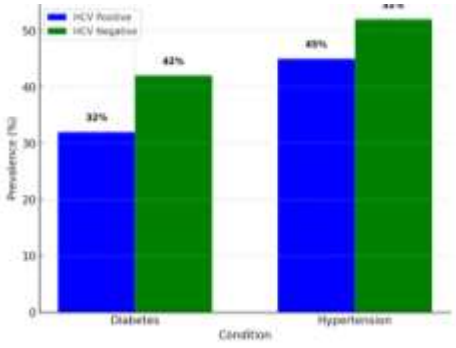

Figure No. 2: Prevalence of Diabetes and Hypertension in HCV Positive and Negative Patients

Table No. 1: Demographic and Clinical Characteristics of the Patients

Characteristic	Total Patients (n=307)	HCV Positive (n=57)	HCV Negative (n=250)
Mean Age (years)	60 ± 8.5	62 ± 7.9	59 ± 8.7
Male (%)	70%	65%	72%
Female (%)	30%	35%	28%

Hypertension (%)	50%	45%	52%
Diabetes (%)	40%	32%	42%

Table No. 2: Lipid Profile of Patients

Lipid Parameter	HCV Positive (n=57)	HCV Negative (n=250)	p-value
Cholesterol (mg/dL)	220 ± 15.7	205 ± 12.3	0.04
LDL (mg/dL)	150 ± 12.5	140 ± 10.2	0.05
HDL (mg/dL)	40 ± 5.3	45 ± 4.8	0.06
Triglycerides (mg/dL)	160 ± 20.4	150 ± 18.7	0.04

Table No. 3: Cardiovascular Risk Factors in HCV Positive and Negative Patients

Risk Factor	HCV Positive (n=57)	HCV Negative (n=250)	p-value
Hypertension (%)	45%	52%	0.02
Diabetes (%)	32%	42%	0.03
Smoking (%)	40%	35%	0.07
Obesity (%)	35%	38%	0.06

Table No. 4: Association between HCV and Cardiovascular Outcomes

Outcome	HCV Positive (n=57)	HCV Negative (n=250)	p-value
Myocardial Infarction (%)	15%	10%	0.04
Stroke (%)	10%	8%	0.05
Heart Failure (%)	20%	15%	0.03
Angina (%)	30%	25%	0.04

DISCUSSION

Possible association between HCV infection and IHD has recently attracted considerable interest. In agreement with the published literature and our study showing that Iranian patients with IHD had a higher frequency of HCV infection, there is increasing evidence of a connection between chronic HCV infection and cardiovascular diseases. More to the point, 18.7% of our IHD patients were HCV-positive and this group had significantly higher cholesterol levels and higher incidence of traditional cardiovascular risk factors including diabetes and hypertension than the HCV-negative patients. This section will involve a discussion of the results of the present study in relation to those obtained in earlier studies. Some previous articles have suggested that HCV may affect the cardiovascular diseases via chronic inflammation and endothelial dysfunction. In 2011 Younossi et al[7] systematically conducted a large Meta-analysis concluding that there is a significantly higher incidence of cardiovascular disease in patients with chronic HCV when compared with the non HCV population. This is in concordance with this finding of higher prevalence in HCV-positive patents with traditional cardiovascular risks factors including hypertension and diabetes. The presence of a chronic inflammatory state due to HCV may result in pro-atherosclerotic and endothelial dysfunction culminating in Ischemic heart disease[10]. Our study builds on this by highlighting that even lipid profiles such as cholesterol and triglycerides are affected in HCV positive IHD patients, thus affording support to the hypothesis that HCV could worsened the lipid metabolism disturbance observed in IHD[11]. The findings of raised cholesterol and triglycerides in the current study in HCV sero-positive subjects are supported by the work done by Adinolfi et al[6] in which the authors showed that patients with chronic HCV infection had raised cholesterol as compared to HCV negative subjects was especially evident in patients with IHD. This implies that HCV may be involved in the production of atherogenic lipid pattern, and hence lead to coronary artery disease. While the pathways are not fully clear, it is postulated that HCV may alter lipid metabolism itself since for the viruses replication lipoproteins of the host are used. Moreover, our results indicated that HCV-positive patients have 15% of myocardial infarction compared to 10% in HCV-negative patients similar to the study conducted by Butt et al[12]. They found that in a cohort study the risk of acute coronary syndrome in HCV infected patients was higher compared to the controls, which included adjustment for traditional cardiovascular risk factors such as hypertension, diabetes, smoking amongst others. This implies that HCV may on its own be a risk factor for myocardial infarction and other forms of ischemic events. It is in support of this line of thinking that our findings underline the call for more research into the directions of pathophysiological link between HCV and the onset of atherosclerosis and the occurrence of acute coronary events. Furthermore, a systematic review carried out Mostafa et al[9] revealed comparable association between HCV and cardiovascular diseases, bringing attention to chronic systematic inflammation. In the review, the author identified other research that had associated increases in certain inflammatory biomarkers including CRP and IL-6 with HCV and IHD. This finding is consistent with our study, given the fact that inflammation in general does precipitate atherosclerosis while HCV inflammation is known to progress this condition. Other investigations also such as Petta et al[13] have identified a higher frequency of carotid artery plaques in HCV infected persons implying an association between HCV and vascular illness. However, some previous studies

did not enhance a significant relationship between HCV and IHD. For example, Tsui et al [14] found there was no statistically significant difference between HCV positive and HCV negative patients with respect to CAD incidence. The differences in the results may be attributed to differences in study methods, the populations studied and the diagnostic criteria used. However, according to most of the studies including the present one, HCV infection possibly plays a role in the development of ischemic heart disease. In conclusion, we have added our own study to the list of work that might indicate that HCV infection may be related to the development of IHD. HCV infection was more prevalent in IHD patients than in the non- IHD patients along with the dyslipidemic state by which HCV increases the risk of myocardial infarction; therefore, HCV screening should be a routine among the targeted population of individuals with cardiovascular diseases. Future work must be done to elucidate these pathways and how HCV may be linked to IHD development and over time.

CONCLUSION

Our work revealed a high prevalence of HCV seropositivity in IHD patients where HCV+ patients were found to have raised cholesterol levels and a propensity to develop MI. These findings raise the possibility of HCV on enhancing cardiovascular risk factors and point to the need to consider HCV screening in cardiovascular disease care strategies.

Future Findings: Thus in the future, more quantitative samples and more long-term research should be commenced to establish the exact link between the HCV and ischemic heart disease. Understanding the concordance relationship between HCV and CVD risk factors at the molecular level will also be important in designing appropriate prevention strategies for such groups.

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Author's Contribution:

Concept & Design of Study:	Muhammad Aamish
Drafting:	Ahsan Ayub, Muhammad Zareef
Data Analysis:	Arwan Ali
Revisiting Critically:	Muhammad Arsalan, Shafique Ahmed
Final Approval of version:	By all above authors

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

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Original Article

Self-Reported Competence in evaluation of Oral Pathological lesions among Dental Graduates of Lahore, Pakistan

Wajiha Alamgir, Uzma Jabbar Khan, Adeel Haider, Adan Zahoor and Fatima Shams

ABSTRACT

Objective: The study was aimed to assess the self-reported competence of dental graduates with basic dental qualification regarding examination of oral and maxillofacial pathologies and provide a comparison of this competence between private and public sector dental graduates of Lahore, Pakistan.

Study Design: cross-sectional descriptive study

Place and Duration of Study: This study was conducted at the among dental graduates of private sector i.e. University Dental College, The University of Lahore and among public sector graduates i.e. de' Montmorency College of Dentistry, Lahore from March 2023 to August 2023.

Methods: A multi-institutional cross-sectional descriptive study was conducted comprising of dental professionals with basic dental qualification of both private and public sector from March till August 2023.The data was collected through non-probability convenience sampling technique using a self-administered questionnaire which was developed in line with four levels of progression of Miller's Pyramid.

Results: Total of 196 dental professionals participated in the study with females (n=125, 63.80%) and those in the age category of below 30 years (n= 138, 70%) in majority with preponderance of house officers (n=133, 67.9%). Nearly half of the total participants were independent in communicating with the patients and addressing their concerns (n=91, 46.4%). Majority of the participants were able to examine a patient with suspicious oral lesion (n=75, 38.3%) as well as salivary glands and lymph nodes examination (n=66, 33.7%) only under supervision. Mainstream of the participants were only knowledgeable about surgical sieve to assemble a list of differential diagnosis (n=70, 35.7%),

Conclusion: The study population was found to be competent in communication skills, history taking and general oral examination. However in the remaining domains, majority of the respondents either merely possessed knowledge or needed supervision to perform the skill.

Key Words: Clinical competence, Clinical examination, Oral pathology

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INTRODUCTION

The complex process of training a dentist presents various challenges, particularly the need for a robust institutional foundation [1]. The academic journey of dental students is progressive that encompasses distinct educational phases, starting with theoretical phase and advancing through pre-clinical and para-clinical training that culminates in clinical education [2,3].

Department of Oral and Maxillofacial Pathology, University College of Dentistry, The University of Lahore.

Correspondence: Dr. Uzma Jabbar Khan, Assistant Professor, Dept. of Oral and Maxillofacial Pathology, University College of Dentistry, The University of Lahore.
Contact No: 03312519095
Email: uzma.jabbar@ucd.uol.edu.pk

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The ultimate goal of undergraduate dental education is to produce competent dental professionals who possess the foundational scientific knowledge, clinical skills and aptitude essential for an independent practice [4].

Alongside performing routine procedures in the dental chair, the responsibilities of dental practitioners are extensive. Proficiency in oral and maxillofacial pathology- a specialty that involves the evaluation and diagnosis of abnormalities in oral tissues, jaw bones and related structures - is an essential skill set given that the oral cavity is not limited to teeth [5]. Mastery of this discipline is crucial for identifying potentially significant conditions and ensuring patient safety and well-being in daily clinical practice[6,7].

Dental boards worldwide outline professional competencies for dentists to achieve during a year-long internship for transition from dental student to independent practitioner[1,7]. Dental graduates must demonstrate competency in patient well-being, ensuring safety and satisfaction through self-assessment, focusing on strengths and areas for improvement[3,4].

Numerous studies have been conducted in Pakistan and other regions of the world to investigate the self-reported competence of dental graduates in a variety of subspecialties with respect to a multitude of dental procedures. Nevertheless, no study has been conducted to assess dental graduates' proficiency based on the clinical examination of oral and maxillofacial pathologies. The most insightful form of this evaluation frequently involves self-assessment, in which graduates critically contemplate on their own readiness and identify areas for further development.

To fill this knowledge gap, the present study is aimed to assess the self-reported competence of dental graduates with basic dental qualification regarding examination of oral and maxillofacial pathologies and provide a comparison of this competence between private and public sector dental graduates of Lahore, Pakistan.

METHODS

A multi-institutional cross-sectional descriptive study was conducted among dental graduates of private sector i.e. University Dental College, The University of Lahore and among public sector graduates i.e. de' Montmorency College of Dentistry, Lahore from March 2023 to August 2023. The data was collected through non-probability convenience sampling technique following the approval of Institutional Ethical Committee. Informed consent was taken from all participants prior to data collection.

Inclusion criteria comprised of dental house surgeons, general dentists and postgraduate trainees who have completed basic dental qualification, while dental students and specialist dentists who have completed postgraduate qualifications were excluded.

A total of 196 questionnaires were distributed to the participants fulfilling the inclusion criteria.

Figure No. 1: Miller's triangle of Clinical competence

Questionnaire: A self-administered questionnaire was developed in line with the four levels of progression - Knows, Knows how, Shows how and Does - from basic knowledge to clinical performance as established in Miller's Pyramid; a framework proposed by George miller in 1990 for assessing clinical competence (Fig.1). The questionnaire was divided into two sections and contained 21 close-ended items. The first segment focused on demographics, while the second part was divided into four domains: history, clinical examination, radiographic examination and differential diagnosis.

The questionnaire items were based on all the required competencies of Oral and Maxillofacial Pathology. The responses were reported on 4 levels of Miller's pyramid ranging from Knowledge, Capability, Performance and Action.

The study utilized SPSS version 25 for data entry and analysis with Chi-Square test for statistical significance. A reliability analysis of questionnaire revealed Chronbach's-alpha value 0.916.

RESULTS

Total of 196 dental graduates participated in the study, out of which 36.20% (n=71) were male and 63.80% (n=125) were female. Majority of the participants (n= 138, 70%) were in the age category of below 30 years followed by11.20% (n=22) with an age range between 31 to 35 years.

The largest proportion of respondents in the present study were house officers (n=133, 67.9%) followed by postgraduate residents (n=26, 13.3%) and private practitioners (n=37, 18.9%).

Nearly half of the total participants were independent in communicating with the patients and addressing their concerns (n=91, 46.4%) as well as in taking adequate medical and oral health history (n=109, 55.6%) (Table 1). A statistically significant correlation was found between work experience and ability to communicate (p=0.001) and history taking (p=0.015).

In first domain of history taking, a significant proportion of graduates believed they were able to examine a patient with suspicious oral lesion only under supervision (n=75, 38.3%) (Table 1). A significant association was found between work experience and ability to examine patients with suspicious oral lesion (p=0.007).

In the domain of clinical examination, mainstream of the respondents (n=83, 42.3%) revealed that they were able to follow the steps of examination on patient independently (Fig. 2). A statistically significant correlation was found between work experience and ability to follow the steps of examination (p=0.001). Most of the respondents (n=80, 40.8%) believed that they were able to perform comprehensive extra oral examination independently (Fig.2). This area of competency was significantly associated with work experience, designation and practice sector (p=0.001, p=0.012, p=0.01) respectively. The independent ability of the participants to identify extra oral swelling and lesion was reported by large proportion of graduates (n=62, 31.61%) (Fig. 2). A significant association was found between respondents work experience and their ability to identify extra oral swelling (p=0.004). Considerable proportion of graduates (n=66, 33.7%) affirmed that they require supervision to examine salivary glands and lymph nodes of head and neck

region (Fig. 2). A statistically significant correlation was seen between participants' work experience, designation and practice sector with this competence (p=0.046, p=0.049, p=0.049) respectively. A comparable ratio of respondents (n=76, 38.8%) reported their independent ability to differentiate between normal and altered oral mucosa (Fig. 2) that revealed statistically significant association with work experience (p=0.030).

Regarding mouth mapping, majority of the respondents (n=64, 32.7%) believed that they required supervision for this aspect of clinical examination. The independent ability of the participants to identify morphological soft tissue changes and hard tissue changes was stated by large proportion of respondents (n=63, 32.1%) and (n=70, 35%) respectively. (Fig.2).

Responses of the radiographic examination revealed that the bulk of the participants possess an independent ability in the relevant competencies which include interpretation of normal anatomical landmarks (n=85, 43.4%), identification of normal and altered bone pattern (n=78, 39.8%) and identification of different radiolucent and radiopaque patterns on radiograph (n=83, 42.3%) (Table 1). A statistically significant correlation was revealed between work experience and ability to identify bone pattern (p=0.030) and radiographic patterns (p=0.042).

In the last domain of formulation of differential diagnoses, mainstream of the participants were knowledgeable about surgical sieve to assemble a list of differential diagnosis (n=70, 35.7%). Furthermore, a sizeable proportion of the respondents (n=63, 32.1%) were able to devise a comprehensive referral plan independently (Table 1) and carried a statistically significant correlation with work experience (p=0.000).

A service sector-based comparison of self-reported competencies of the study participants revealed that public sector graduates were more competent holistically except in documentation of the clinical findings and interpretation of anatomical radiographic landmarks where private sector respondents were more proficient (Table 2).

A significant statistical association was observed between the practice sector of participants and ability to perform extra oral examination (p=0.012), examination of head and neck lymph nodes and salivary glands (p=0.049) and ability to identify morphological hard tissue changes (p=0.001). (Table 2).

Table No. 1: Frequency and percentage distribution of competencies

Study items	Responses n (%)			
	Knows (Knowledge)	**Knows how (Capability)**	**Shows how (Performance under supervision)**	**Does (Action/ Independent)**
History Taking				
1. Ability to effectively communicate with the patients and address their concerns	15 (7.7%)	55 (28.1%)	35 (17.9%)	91 (46.4%)
2. Ability to take adequate medical & oral health history	13 (6.6%)	58 (29.6%)	16 (8.2%)	109 (55.6%)
Radiographic Examination				
3. Ability to interpret the normal anatomical landmarks on radiograph	12 (6.1%)	53 (27.0%)	46 (23.5%)	85 (43.4%)
4. Ability to identify normal and altered bone pattern n radiograph	13 (6.6%)	42 (21.4%)	63 (32.1%)	78 (39.8%)
5. Ability to identify different radiolucent and radiopaque patterns on radiograph	17 (8.7%)	45 (23.0)	51 (26.0%)	83 (42.3%)
Differential Diagnosis				
6. Considering surgical sieve while developing differential diagnosis	70 (35.7%)	33 (16.8%)	58 (29.6%)	35 (17.9%)
7. Ability to formulate differential diagnosis	23 (11.7%)	49 (25.0%)	59 (30.1%)	65 (33.2%)
8. Applied knowledge of diagnostic framework	44 (22.4%)	47 (24.0%)	59 (30.1%)	46 (23.5%)
9. Ability to devise comprehensive referral plan	31 (15.8%)	40 (20.4%)	62 (31.6%)	63 (32.1%)

Table No. 2: Comparison between public and private sector competencies

Study items	Public Sector (Independently)	Private Sector (Independently)	p-value
1.Ability to communicate effectively	48%	43.5%	0.355
2.Ability to take adequate medical & oral health history	58.3%	50.7%	0.787
3.Ability to examine a patient with suspicious oral lesion	30.7%	24.6%	0.272
4.Follow the steps of examination while examining a patient	45.7%	36.2%	0.119
5.Ability to perform comprehensive extra oral examination	43.3%	36.2%	*0.012
6.Ability to identify extra oral swelling & lesion	33.9%	27,5%	0.185
7.Ability to examine head & neck lymph nodes & salivary glands	28.3%	24.6%	*0.049
8. Ability to differentiate between normal and altered oral mucosa	41.7%	33.23%	0.456
9. Ability to perform mouth mapping effectively	33.9%	27.5%	0.420
10. Proficiency in identifying morphological soft tissue changes	33.1%	30.4%	0.337
11. Ability to identify morphological hard tissue changes	40.9%	26.1%	*0.001
12. Ability to appropriately describe the characteristics of the lesion	31.5%	29%	0.892
13. Ability to correlate history with clinical findings	37.8%	34.8%	0.544
14. Proficiency in documenting the clinical findings	38.6%	40.6%	0.741
15. Ability to interpret the normal anatomical landmarks on radiograph	43.3%	43.5%	0.590
16. Ability to identify normal and altered bone pattern n radiograph	41.7%	36.2%	0.268
17.Ability to identify different radiolucent and radiopaque patterns on radiograph	46.5%	34.8%	0.080
18. Considering surgical sieve while developing differential diagnosis	19.7%	14.5%	0.106
19. Ability to formulate differential diagnosis	36.2%	27.5%	0.604
20. Applied knowledge of diagnostic framework	26%	18.8%	0.644
21. Ability to devise comprehensive referral plan	34.6%	27.5%	0.199

*p-value < 0.05 is considered statistically significant

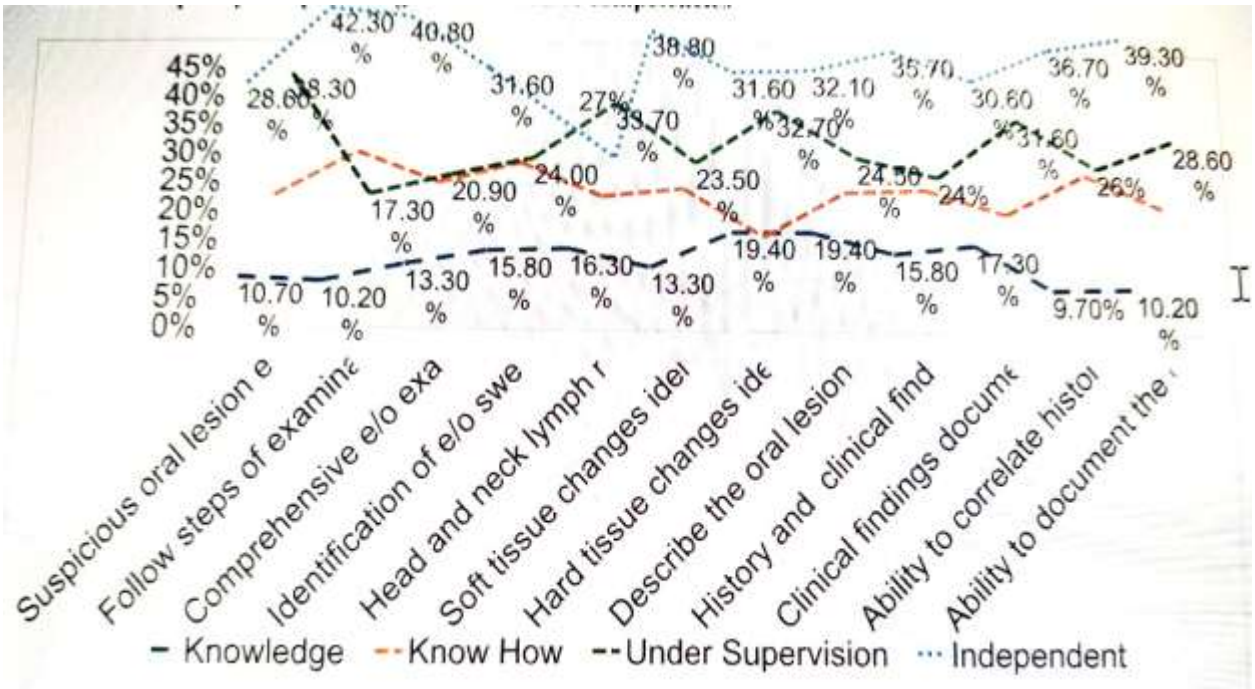

Figure No. 2: Percentage distribution of clinical examination competencies

DISCUSSION

The capacity to precisely identify and diagnose oral pathological lesions is a critical skill for any dental practitioner, as it serves as a bridge between theoretical knowledge and real-world clinical performance[8]. All sub-specialties of dentistry hold paramount importance; however Oral and Maxillofacial Pathology is the only discipline of dentistry that embodies the integration of basic sciences and clinical dentistry [9].

The objective of the study was to investigate dental graduates' transition from training to independent practice in Lahore, Pakistan, focusing on self-assessment and comparing private and public sector competencies, emphasizing the importance of structured training programs.

The preponderance of participants in this study were female (63.8%, n=125). The age group of 30 years was represented by the greatest number of participants (85.7%, n=71) The sample was representative of dental graduates from both public and private dental colleges in Lahore. Majority of the participants (67.9%, n=133) were house officers.

In current investigation, less than half of the participants (n=91, 46%) reported being capable of communicating independently with patients. This is in contrast with the finding of Adam et al., where a vast majority (n=60, 92.3%) of participants from Otago University exhibited independent communication skills[10]. Additionally, 55.6% (n=109) of dental graduates in this study were independent in obtaining and interpreting a comprehensive medical and dental history which are incongruous with the study conducted by Bokhari et al., where a substantial majority (78%, n=153) was competent in the recording and interpretation of patients' medical histories [9].

It is imperative for the dentists to conduct comprehensive examinations for patients with suspicious oral lesions to prevent severe health complications and poor outcomes[11,12]. The present investigation demonstrated that less than half (n=56, 28.6%) of graduates were capable of conducting the examination independently. This is consistent with the results of Kumar et al., where only 24% of dental personnel were capable of independently identifying suspicious oral mucosal lesions[13]. In the current study, 40.8% (n=80) of participants were able to conduct extraoral examination. This is contrary with the findings of Glass et al., where a majority (96%) of general practitioners routinely examine extraoral sites[14].

A thorough clinical examination is not confined to oral structures, it includes palpation of lymph nodes of head and neck region and inspecting the salivary glands [15]. In the present study a lesser number of graduates (n=53, 27%) claimed that they can examine lymph nodes and salivary glands independently, which is contrary to the findings of Omer et al., where 47.3% of the respondents responded that they examine lymph nodes in suspected oral cancer patients [16].

Oral cavity is the face of some of the systemic diseases, it is essential to focus on mucosal alteration and perform complete examination of any mucosal variation. The ability to differentiate between normal and altered oral mucosa independently was seen in nearly half (n=76, 38.8%) of the graduates in the present study which was comparable to the finding of the study by Gaballah et al, where less than half of the study participants (n=151,15.2%) out of total 350 were able to identify the oral mucosal variation[12]. Lesser number of graduates (n=60, 30.9%) affirmed that they were proficient in describing the characteristics of a lesion which is in line with the results of Gaballah et al where a comparable number of the participants (n=57, 8.2%) were able to describe the lesion independently[12].

Clinical documentation is crucial for effective communication among dental professionals, legal protection, facilitating accurate diagnosis, treatment planning, and follow-up. In the current investigation, only 39.3% (n=77) of dental graduates considered themselves proficient in documenting clinical findings. This contrasts with the results of Alsoghier et al., where 71% of respondents were competent in documenting patient clinical notes[11].

Dental graduates should possess the skills to accurately assess abnormalities on radiographs, as they are crucial diagnostic tools for various anatomical structures and pathologies. In the current study 43.4% respondents (n=85) stated that they are competent in interpreting the normal anatomical landmarks on radiographs which is far less than the result of Qazi et al who demonstrated that 63.6% of the dentists were able to interpret dental radiographic findings[1].

The surgical sieve facilitates a structured analytical approach allowing clinicians to consider a range of differential diagnosis[18]. In the present study, an unexpected proportion of respondents (n=70, 35.7%) claimed that they only have knowledge on formulating differential diagnosis considering surgical sieve which contrasts with the finding of Bokhari et al where majority of the participants reported that they are well prepared in making differential diagnosis[9].

The study revealed that young dental professionals are struggling with transitioning from academic learning to independent practice, particularly in identifying oral lesions, ensuring comprehensive clinical documentation, and applying diagnostic skills. To improve quality of dental care, mentorship is needed along with practical training and self-assessment.

CONCLUSION

The present study highlights the strengths and weaknesses of dental graduate of Lahore, Pakistan regarding oral pathological examination. The study population was found to be competent in

communication skills, history taking and general oral examination. However, majority of the respondents had merely knowledge regarding examination of oral pathologies, surgical sieve and formulation of differential diagnosis and required supervision in these tasks. The study highlighted the need of implementing suitable educational strategies to enhance graduates' proficiency in examining Oro-facial pathologies, thereby preparing them for independent practice.

Author's Contribution:

Concept & Design of Study:	Wajiha Alamgir
Drafting:	Uzma Jabbar Khan, Adeel Haider
Data Analysis:	Adan Zahoor, Fatima Shams
Revisiting Critically:	Wajiha Alamgir, Uzma Jabbar Khan
Final Approval of version:	By all above authors

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Original Article

Alvarado Versus Modified Ripasa Score in Diagnosis of Acute Appendicitis

Daulat Azeem Khan and Muhammad Amer Mian

Diagnostic Accuracy of Modified Ripasa and Alvarado Score with Acute Appendicitis

ABSTRACT

Objective: The aim of this present study is to assess and compare the diagnostic accuracy of the Modified RIPASA Score and Alvarado Score in patients with suspected acute appendicitis.

Study Design: cross-sectional comparative study.

Place and Duration of Study: This study was conducted at the Department of Surgery, Central Park Teaching Hospital, Lahore from January 2023 to December 2023.

Methods: As a part of the cross-sectional comparative research study was conducted on 300 participants who were exhibiting symptoms which were suggestive of acute appendicitis. Patients were selected on the bases of inclusion and exclusion criteria. Alvarado Score and Modified RIPASA Score were calculated for each one of the patients. Usually, the standard clinical practice was followed through diagnostic imaging like CT or ultrasound scans. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of the two scoring systems were calculated.

Results: The details provided in research analysis included the sensitivity, specificity, positive predictive value, and negative predictive value, diagnostic accuracy of Modified RIPASA Score and Alvarado Score.

Conclusion: The study tried to get information on the comparison of the diagnostic efficiency of the Modified RIPASA Score and Alvarado Score in acute appendicitis. It was found that sensitivity of both the systems was almost same, but specificity and accuracy of Modified RIPASA was more than Alvarado scoring system.

Key Words: Acute appendicitis, Alvarado Score, Modified RIPASA Score, diagnostic accuracy, clinical scoring systems, appendectomy, abdominal pain, surgical emergency.

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INTRODUCTION

Acute appendicitis despite being a common problem, remains a difficult diagnosis to establish. A delay in diagnosing this condition as well as negative appendicectomies should be prevented. These problems can be avoided by using scoring systems[1]. Therefore, for assessing the effectiveness, accuracy and suitability of each scoring system in diagnosing acute appendicitis out of these two, this study does a comparative analysis[2].

First proposed by Alvarado et al. in 1986, the Alvarado Score has been one of the main tools commonly used in the assessment of a patient with lower quadrant abdominal pain on the right side[3]. Every criterion is assigned a numerical rating according to the patient's clinical signs, symptoms, and laboratory values.

Department of Department General Surgery, Central Park Teaching Hospital, Lahore.

Correspondence: Daulat Azeem Khan, Department General Surgery, Central Park Teaching Hospital, Lahore.
Contact No: 0331-4539994
Email: drdaulatazeemkhan@gmail.com

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It is possible to classify patients into three risk categories, low, intermediate, and high, for acute appendicitis using the total score as it has been pointed out by clinicians[4]. Thus, it is evident that there is a need for new diagnostic approaches since the Alvarado Score which is one of the most commonly applied scores, has been regarded as subjective and having low specificity[5].

Possible substitution of the Alvarado Score that would eliminate its defects might be the Modified RIPASA Score introduced by Ohle et al. in 2008. To increase the effectiveness of the appendicitis diagnosis, this method involves additional clinical indicators, for example, with regard to urine tests and the reaction to conservative therapy[6]. The Modified of RIPASA Score was created in Brunei and has extended to other regions because it is believed to predict needless appendectomy and has high sensitivity for acute appendicitis.

The comparison of Modified RIPASA Score and Alvarado Score is done by looking into each of the elements individually. Indicators that are included in the calculation of the score in Alvarado score include pain migration, anorexia, nausea, vomiting, right lower quadrant tenderness, rebound discomfort, increased temperature, leukocytosis and shift of leukocyte count to the left[7]. However, the Modified RIPASA Score, takes into account quite a number of attributes such as; Age, RIF pain, Migration to RIF, duration of

symptoms, RIF rebound tenderness, RIF guarding, fever, total leukocyte counts, neutrophilia, Rovsing sign, anorexia, vomiting and localized tenderness in RIF[8]. Information on urine test results is included in the Modified RIPASA score, which is considered a modern approach, which reflects the developments in the diagnostic capabilities[9]. The accuracy of Alvarado score in the diagnosis of acute appendicitis is disappointingly low in Asian population and RIPASA scoring has been designed for the diagnosis of acute appendicitis in the Asian population[10].

It is against this background that this research study will add on to existing knowledge in the comparison between Alvarado Score and Modified RIPASA Score in the diagnosis of acute appendicitis. Thus, we plan to establish the strengths and weaknesses of each rating system and offer potential outcomes to the doctors using data from relevant publications[11]. This paper aims to assist medical practitioners in the right choice of the most effective diagnostic tool in the diagnosis of acute appendicitis to help enhance patients' health[12,13].

METHODS

A cross-sectional prospective study was conducted in department of surgery Central Park Teaching Hospital Lahore for the comparative assessment of the Modified RIPASA Score and the Alvarado Score in patients of acute appendicitis presenting in Out patient Department (OPD) and emergency from January 2023 to December 2023. This study was conducted under the principles of Helsinki declaration; ethical approval was obtained from institutional review board of Central Park Medical College Lahore and prior written informed consent was obtained from all the study participants. In this comparative study all the patients with age range of 18 to 60 years were included while the patients of pregnant females,less than 18 years old, appendicular mass while those who have to undergone laparotomy were excluded from the study.

After signing the informed consent; detailed sociodemographic history and details like right lower quadrant pain or periumbilical pain migrating to right lower quadrant with nausea and vomiting, Low grade fever, Right lower quadrant guarding and tenderness on physical examination were recorded. All the patients undergoing the studies were subjected to both scales; RIPASA and modified Alvarado scoring systems were employed. The performed appendectomies were subjected and were sent for histopathology. Patients were monitored postoperatively for two days and were discharged on oral medication and later on were followed after 1 week.

Statistical Analysis:

Anonymized data was entered into Statistical Package Software for Social Sciences (SPSS) version 26.0. Qualitative data was presented in terms of frequencies and bar charts. Chi-square test was employed for the assessment of study variables among and between study groups. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of the two scoring systems were calculated. A p-value less than 0.05 was regarded as significant.

RESULTS

A total of 300 patients with mean age of 34.17+16 years were recruited for the study with the age range of 18 to 60 years. Duration of symptoms was recorded as less than 48 hours or above than 48 hours as explained in table 1. 207 patients (69%) has positive histopathology while 31% had negative histopathology with p-value 0.002. Assessment and comparison via chi-square was made for both study variables as explained in table 1 and later on sensitivity and specificity was also assessed as explained in table 2 and 3.

Table No. 1. Assessment of Study Variables using Chi Square Test.

Study Variable	Groups	n	%	P-value
Symptom Duration	<48 hours	210	70	0.0034
	>48 hours	90	30	
Histopathology	Positive	207	69	0.00001
	Negative	93	31	
Modified RIPSA Scoring	5-7	40	13.33	0.0001
	8-11	110	36.67	
	12-15	150	50	
Alverado Scoring	5-6	50	16.67	0.003
	7-8	102	34	
	9-10	148	49.33	

The disposition of patients after appendectomy depending on their Alvarado scores and the histological findings are tabulated in Table 2. Three score ranges 5-6, 7-8, and 9–10 were used in measuring Alvarado Score in terms of the sensitivity, specificity, and accuracy. The sensitivity levels of the Alvarado Score are all high, thus proving the test's ability to effectively identify the presence of acute appendicitis within the patient population. The specificity also decreases in line with the score showing, patients who get the high Alvarado Score may get more false positive results.

Table 3 shows the distribution of the patients based on their Modified RIPASA Scores and histopathology findings. Similar to Alvarado Score, sensitivity over the entire score range was high for Modified RIPASA Score also. Here, a higher Modified RIPASA Score improves the test's specificity, indicating that patients with higher scores are less likely to endure many false positive results.

Table No. 2: Alvarado Score Distribution and Associated Histopathological Results

Alvarado Score	Number of Patients	True Positive	True Negative	False Positive	False Negative	Sensitivity	Specificity	Accuracy
5-6	50	26	16	5	3	89.6%	76.1%	84%
7-8	102	64	29	16	3	95.57%	82.8%	91.1%
9-10	148	90	10	40	4	95.7%	90.9%	87.8%

Table No. 3: Distribution of the Modified RIPASA Scores and the Associated Histopathological Results

Modified RIPASA Score	Number of Patients	True Positive	True Negative	False Positive	False Negative	Sensitivity	Specificity	Accuracy
5-7	40	18	15	5	2	90%	75%	82.50%
8-11	110	73	30	5	2	97.34%	85.7%	93.64%
12-15	150	110	36	2	2	98.2%	94.7%	97.3%

DISCUSSION

Appendicitis is one of the most commonly encountered surgical emergencies and timely diagnosis is crucial to giving the patient the best outcome. Acute appendicitis may be diagnosed with the use of two popular clinical scoring systems: the Modified RIPASA score, and Alvarado scoring system[14]. Both scoring systems used an attempt of gathering clinical signs, symptoms, and laboratory test results to classify the population of interest into low risk, moderate risk, and high risk. In this conversation we have discussed about the pros and cons of Modified RIPASA Score and the Alvarado Score which show the use of them in clinical practice[15].

The Alvarado Score is readily understandable and implies multiple clinical factors like indications, symptoms, test results and so on. The first release of this format was in 1986. The mortality rate is also higher for clients with higher scores, which means increased risk of acute appendicitis[16]. The scoring system ranges from one to ten. The objective bases of the Alvarado Score and its reliance on the clinician's assessment have led to criticism, even though it is used frequently. However, owing to this reason, it can therefore be applied quickly and easily for preliminary assessment in resource constraint setting[17].

On the other hand, in an attempt to gain better diagnostic accuracy, The 2010 Modified RIPASA Score incorporates new clinical variables and information from the biochemical analysis that is obtained from urine. While completing the Alvarado Score, the elements such as urine analysis evidence are missing, but in the Modified RIPASA Score, they are included. it also incorporates geographical factors into consideration. This comprehensive strategy might help decrease false-positive results and false-negative outcomes in populations with atypical manifestations of appendicitis.

Literature review showed that there are inconsistent results in relation to the diagnostic performance of the Modified RIPASA Score compared to Alvarado Score. Some reported no difference in the two scoring systems while others point out that Modified RIPASA Score is more sensitive and specific[18]. Variability in the patient groups, the healthcare setting, and the physicians' practice utilizing the ratings might be the reason for the variation.

Therefore, it is advantages to use the Alvarado Score in instances where there are limited resources and the access to rather complicated imaging is limited. However, since the Modified RIPASA Score relies on findings in urinalysis it may increase the healthcare cost and consumption of resources[19]. Concerning the selection of the scoring system, the choice of the efficient scoring system has to meet the criterion of rational use of resources and could provide an acceptable level of accuracy in a certain clinical setting. Furthermore, it can also be more helpful for the experienced clinician because it depends more on the diagnosis's clinical insight and historical background than the other scoring systems. However, Modified RIPASA score requires a urine analysis report and as a result, it probably would be more preferable in a setting where a urine analysis facility is readily available [20]. One has to pay attention to a healthcare facility's clinical expertise when choosing between the two mentioned rating systems.

Each has advantages and disadvantages when it comes to diagnosing acute appendicitis: In particular, due to its simplicity and efficiency, Alvarado Score can be used as the first line screening in environments with limited resources[21]. On the other hand, the more elaborate approach of the Modified RIPASA Score that includes urine tests could enhance the diagnostic accuracy especially in the populations with atypical manifestations.

The use of the Modified RIPASA Score and the Alvarado Score requires an evaluation based on the scenario of each patient, availability of devices and options, and team's proficiency. Further researches have to reveal how effective these scoring systems for

definite patients' groups are to ensure that the clinicians can make right decision to identify acute appendicitis as many as possible.

CONCLUSION

Though the Modified RIPASA score has proven to have a better promise of effectiveness with the correlates obtained through its additional characteristics, including urine analysis, the Alvarado score is still frequently applied for screening resource limited population. Therefore, further and more detailed research is needed to come up with definite conclusions at a patient population level. Hence, based on the results, decision to use Modified RIPASA or Alvarado scores should be made with due consideration of the resources.

Author's Contribution:

Concept & Design of Study:	Daulat Azeem Khan
Drafting:	Muhammad Amer Mian
Data Analysis:	Muhammad Amer Mian
Revisiting Critically:	Daulat Azeem Khan
Final Approval of version:	By all above authors

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Case Report

A New Approach for Management of Carious Premolars. "A Case Report"

Maher Abdullatif Walid

ABSTRACT

With the main goals of retaining natural dentition and harmonic periodontal restorative interrelationship, a second premolar with deep distal caries was managed to expose sufficient tooth structure for further restorative treatment. Using BENEX atraumatic extraction system, the tooth was surgically extruded and stabilized at a required level for three months, followed by its final restoration. The case was followed up to 1 year after extrusion that showed a healthy soft and hard supportive tissues.

Key Words: Premolar, Extrusion, Crown Lengthening, Benex

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INTRODUCTION

With the wide popularity of dental implants as a replacement of badly destroyed teeth, retaining the natural dentition should always be the main goal of dentists in their practices[1].

Insufficient tooth structure to achieve proper tooth preparation may occur due to deep carious lesions, traumatic injuries and iatrogenic factors[2]. Several techniques have been proposed for crown lengthening to expose sufficient tooth structure, improve restoration retention, and achieve biologically accepted prosthetic clinical margin[2]. Some of Crown lengthening techniques includes gingivectomy or apical flap repositioning with or without resective osseous surgery, as well as, forced orthodontic eruption with or without fibrotomy[1]. However, these techniques have limitations, and selection of the proper technique has to put into account patient acceptance, esthetic demands, duration/ease of the procedure, and the final stability/restorability of the tooth[1,2].

Surgical extrusion is defined as the procedure where the remaining tooth structure is re-positioned supragingivally in the socket[1]. The main goal for this procedure is to reestablish the tooth biologic supra crestal structure that is important to create a good restoration[1].

Described steps in this technique are: soft tissue detachment, tooth luxation with periotome, tooth extraction with forceps, and tooth fixation to adjacent teeth, and after the healing period, placement of final restoration[1,3].

The BENEX atraumatic extraction system is designed to extract extensively damaged teeth by applying a force directed through the tooth long axis, and thus reducing the lateral damaging forces on the lateral wall of the socket[1,2]. This vertical extrusive force sheers the periodontal ligament and moves the tooth in the coronal direction that helps in reestablishing the biologic supra structure of the tooth when the tooth is stabilized for a healing period to start restorative procedure[1,2].

In this case report, an upper second premolar with deep subgingival distal caries was endodontically treated. To reestablish the supra crestal structure for adequate restoration, extrusion with BENEX system was performed, and after a 3-month stabilization, a cast post and core and a final PFM crown was completed. And the case was followed for more than 1 year.

PATIENT AND OBSERVATION

2.1. Patient Information:

A 39-year-old male patient who is healthy and non-smoker with high functional and esthetic demands presented for definitive treatment of a maxillary left second premolar. The tooth had a carious lesion extends distally bellow the gingival margin (Figure1:a).

2.2. Diagnostic assessment:

A CBCT (Dentsply Sirona GALLILIOS 3D, Germany) was completed. Analysis of CBCT images (BlueSkyPlan3.29.28, BlueSkyBio, USA) showed intact buccal plate, extensive caries in the crown, a single root with two canals those merge into a single apex and a small periapical radiolucency (Figure1:a,b)

Treatment options included: 1) endo treatment followed by: a: surgical crown lengthening, b: orthodontic extrusion, c: surgical extrusion. 2: extraction followed by: a: 3-unit bridge, b: implant placement with a crown restoration. After a discussion with the patient, endo treatment followed by surgical extrusion, cast post and crown restoration was selected for this case, and an

Department of Periodontology and Implant Dentistry, College of Dentistry, Qassim University, Saudi Arabia.

Correspondence: Maher Abdullatif Walid, Department of Periodontology and Implant Dentistry, College of Dentistry, Qassim University, Saudi Arabia
Contact No: 0096537101027
Email: m.walid@qu.edu.sa

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informed consent was signed by the patient prior to intervention.

2.3. Therapeutic interventions:

After completing the endodontic treatment for this tooth (Figure1:c,d), the BENEX root extraction system (Helmut ZEPF Medizintechnik, GmbH, Hager & Meisinger GmbH) tray was adapted over the occlusal surfaces of adjacent teeth using impression rubber base (Express TM VPS impression Material, Putty, 3M, USA) and the gingival detachment was completed with a Periotome #1 (Nordent, USA) (Figure1:e). Following sequential drilling with the BENEX rotary burs in the palatal canal, the corresponding extraction screw was inserted in the canal, and attached to BENEX Extraction devices that got support over the adapted tray (Figure1:f,g,h).

Controlled extrusion of the tooth was performed until the distal margin of the cavity was 1mm over the gingival margin, then the BENEX device was detached and the extruded tooth was stabilized with a rigid composite splint to the adjacent tooth. An out of occlusion GIC restoration was completed to fill the cavity and assure proper sealing during healing period (Figure2:a:b).

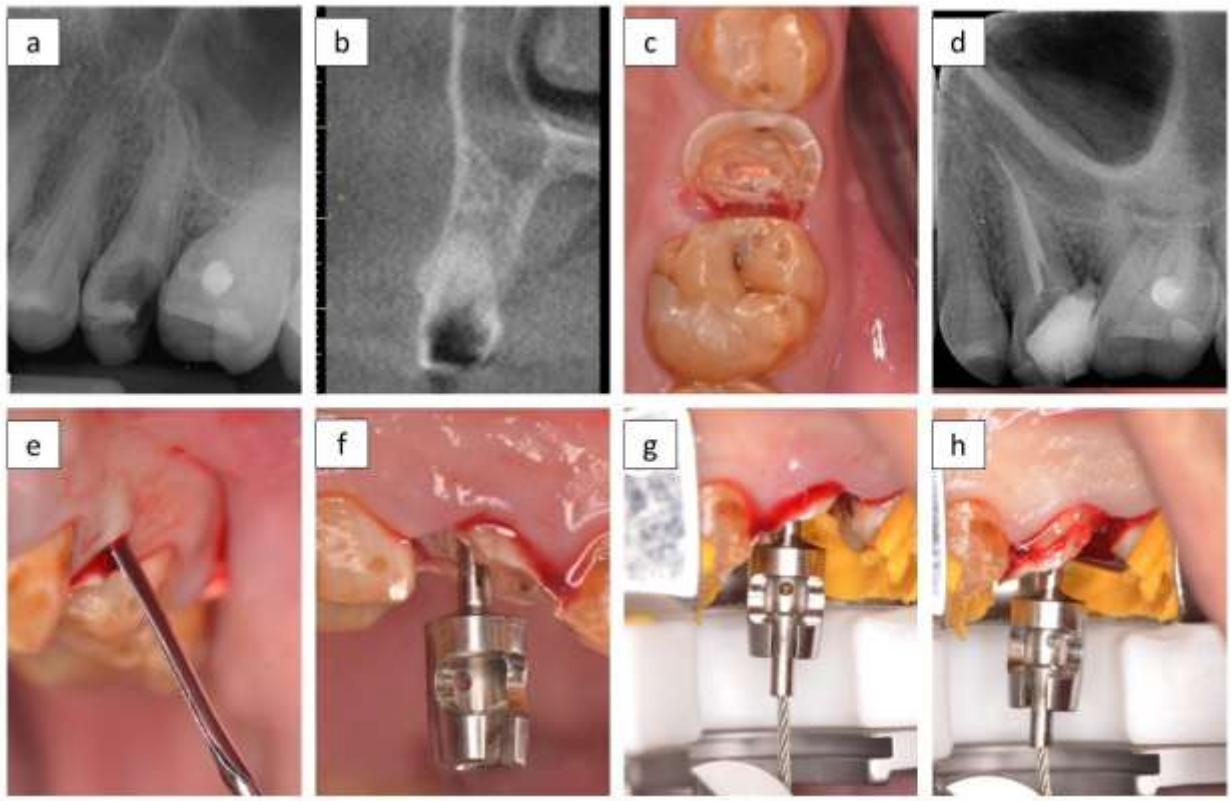

Figure No.1: a: preoperative periapical x-ray for tooth #25 showing the deep distal caries, b: cross-sectional view showing intact buccal bone around tooth, c: completing root canals obturation, d: periapical x-ray following endodontic treatment, e: gingival detachment with periotome #1, f: extraction screw inserted into palatal canal, g: the benex extraction system, h: Surgical extrusion of tooth #25.

2.4. Follow-up and outcome of interventions:

After 3 month the composite splint was removed and the extruded tooth showed no mobility. Impression for a cast post was completed. And after cementation of the post gingivectomy with Diode laser (SiroLaser Blue, Dentsply Sirona, USA) was performed to levelize the gingival margin with adjacent teeth. A PFM crown was fabricated and cemented in place (Figure2:c,d,e,f).

At 1-year recall, the patient reported no problems in the extruded tooth, on clinical examination the tooth was asymptomatic, not tender to percussion and palpation and mobility within physiologic limits. The gingival tissue was healthy with no signs of inflammation and probing depth were within physiologic limits. Radiographic examination showed stable healed bone and intact buccal bone over the extruded tooth (Figure2:g,h)

DISCUSSION

The basic principle for supra-crestal soft tissue attachment health assures that there should be at least 3 mm between the restoration margin and the bone crest to prevent periodontal breakdown[4]. In order to obtain satisfactory esthetic and functional results, different anatomic and biologic consideration have to be

respected when planning for crown lengthening procedures to preserve soft and hard tissue, especially in the esthetic zone[1]. Surgical extrusion aims to reposition the tooth in a more coronal place be severing the periodontal attachment in order to obtain supragingival sound tooth structure for a physiologically healthy final restoration[1,5].

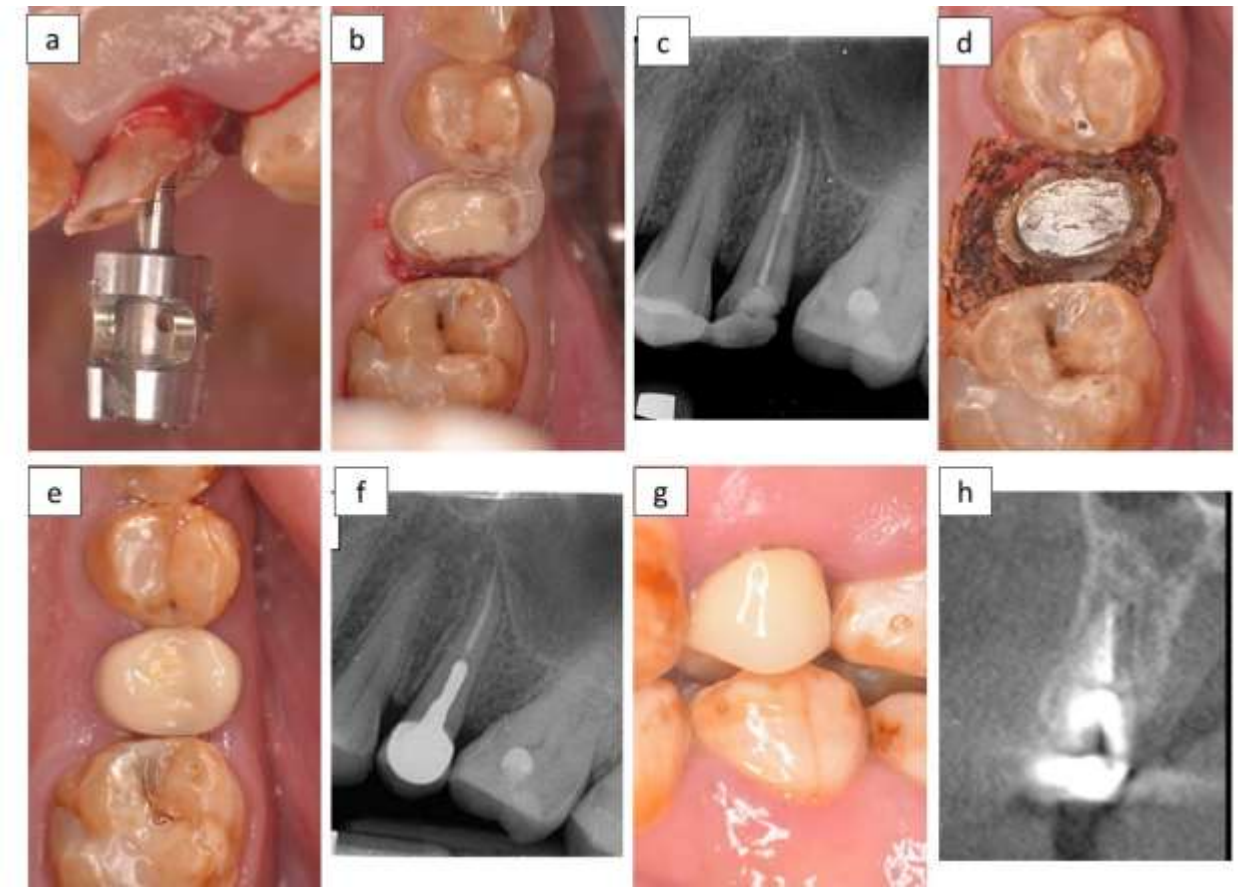

Figure No.2: a: Detachment of BENEX Extraction Device, the distal margin of the cavity is 1 mm supragingival, b: Composite rigid splint with adjacent tooth, c: periapical x-ray 3-month after surgery, d: Cast post cemented in place and Occlusal view of laser gingivectomy, e: Occlusal view of the PFM crown, f: Final (PA) x-ray, g: 1-year recall, h: cross sectional CBCT of 1 year recall showing intact buccal bone around tooth.

The BENEX atraumatic extraction system offers quite a few benefits over the other extrusion techniques by minimizing the trauma to periodontal tissue[6]. By delivering axial extrusive forces over several minutes on the tooth, this system reduces the potential traumatic injuries resulting from lateral forces responsible for increasing the risk of periodontal defects, and thus, maintaining the integrity and stability of the alveolar socket after extrusion[7].

The present study displayed a favorable outcome after surgical extrusion of a non-restorable tooth. in consistent with earlier studies[8,9], the surgical extrusion procedure using an atraumatic extraction devise had the advantages of less operative and overall treatment time, a relatively easy procedure with a low cost, and short chair-time of treatment. And in one year recall, the tooth that was badly destroyed was in function with no clinical and radiographical complications. From another view, possible adverse events associated with surgical extrusion using atraumatic extraction devise were reported in other studies[6,7], those include root fracture, superficial root resorption, crestal bone resorption and persistence of tooth mobility.

In the presented case, the BENEX system was successfully used as a part of restorative treatment of the badly destroyed maxillary premolar. The conservative means of extrusion showed acceptance by the patient, no complications if any, and good soft and hard tissue healing for up to one year follow up. Since the BENEX system was designed for atraumatic extraction, long term follow-up is required to evaluate whether the outcomes for this approach on soft and hard tissues are achievable compared to alternative surgical crown lengthening techniques.

CONCLUSION

Surgical extrusion using BENEX atraumatic extraction system can be a successful alternative in restorative plans for selected teeth. With the minimal invasive and favorable outcome of this procedure as shown in the case report. Further studies with larger number of teeth and longer-term follow-up are needed to confirm the advantages of this protocol as a treatment option

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