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Editorial

Healthy Life with Asthma

Prof. Dr. Azhar Masud Bhatti
Editor-in-Chief

Introduction

Asthma is a chronic lung disease affecting people of all ages. It is caused by inflammation and muscle tightening around the airways, which makes it harder to breathe.

Asthma is often under-diagnosed and under-treated, particularly in low- and middle-income countries.

People with under-treated asthma can suffer sleep disturbance, tiredness during the day, and poor concentration. Asthma sufferers and their families may miss school and work, with financial impact on the family and wider community. If symptoms are severe, people with asthma may need to receive emergency health care and they may be admitted to hospital for treatment and monitoring. In the most severe cases, asthma can lead to death.

The development of asthma, often presenting in childhood, is associated with other atopic features, such as eczema and hay fever.[1,2,3] Severity varies from intermittent symptoms to life-threatening airway closure. Healthcare professionals establish a definitive diagnosis through patient history, physical examination, pulmonary function testing, and appropriate laboratory testing. Spirometry with a post-bronchodilator response (BDR) is the primary diagnostic test. Treatment focuses on providing continued education, routine symptom assessment, access to fast-acting bronchodilators, and appropriate controller medications tailored to disease severity.

Symptoms

Symptoms of asthma can vary from person to person. Symptoms sometimes get significantly worse. This is known as an asthma attack. Symptoms are often worse at night or during exercise.

Common symptoms of asthma include:

- a persistent cough, especially at night
- wheezing when exhaling and sometimes when inhaling
- shortness of breath or difficulty breathing, sometimes even when resting
- chest tightness, making it difficult to breathe deeply.

Some people will have worse symptoms when they have a cold or during changes in the weather. Other triggers can include dust, smoke, fumes, grass and tree pollen, animal fur and feathers, strong soaps and perfume.

Symptoms can be caused by other conditions as well. People with symptoms should talk to a healthcare provider.

Etiology

Genetics

Asthma manifests with diverse phenotypes, likely influenced by intricate interactions between genetic and environmental factors.[4,5]

Risk Factors

Risk factors for asthma development encompass exposures throughout a patient's lifespan, including the perinatal period. The most substantial known risk factor is atopy, which is characterized by the genetic tendency to produce specific immunoglobulin E (IgE) antibodies in response to common environmental allergens. Nearly one-third of children with atopy will develop asthma later in life.

Prenatal and Perinatal Factors

Prematurity is the most crucial risk factor influencing asthma incidence during this period.[6-9] Preterm birth, occurring before 36 weeks, is associated with an elevated risk of asthma throughout childhood, adolescence, and adulthood. Researchers posit that impaired lung development in preterm infants, even in those without early respiratory complications, increases the long-term risk of asthma.[10]

Childhood

Wheezing caused by viral infections, particularly respiratory syncytial virus and human rhinovirus, may predispose infants and young children to develop asthma later in life.

Adulthood

The most significant risk factors for adult-onset asthma include tobacco smoke, occupational exposure, and adults with rhinitis or atopy. Studies also suggest a modest increase in asthma incidence among postmenopausal women taking hormone replacement therapy.

Aspirin-Exacerbated Respiratory Disease

Aspirin-exacerbated respiratory disease (AERD) is a condition characterized by a combination of asthma, chronic rhinosinusitis with nasal polyposis, and NSAID intolerance.

Occupational-Induced Asthma

Two types of occupational asthma,

- Occupational asthma triggered by workplace sensitizers results from an allergic or immunological process associated with a latency period induced by both low- and high-molecular-weight agents.
- Occupational asthma caused by irritants involves a nonallergic or nonimmunological process induced by gases, fumes, smoke, and aerosols

Pathophysiology

Asthma is a syndrome characterized by diverse underlying mechanisms and involves intricate interactions among inflammatory and resident airway cells.

- Airway Inflammation
- Airflow Obstruction

- Aspirin-Exacerbated Respiratory Disease
- Occupational-Induced Asthma

WHO describes some key facts about asthma.

- Asthma is a major noncommunicable disease (NCD), affecting both children and adults, and is the most common chronic disease among children.
- Inflammation and narrowing of the small airways in the lungs cause asthma symptoms, which can be any combination of cough, wheeze, shortness of breath and chest tightness.
- Asthma affected an estimated 262 million people in 2019[11] and caused 455 000 deaths.
- Inhaled medication can control asthma symptoms and allow people with asthma to lead a normal, active life.
- Avoiding asthma triggers can also help to reduce asthma symptoms.
- Most asthma-related deaths occur in low- and lower-middle-income countries, where under-diagnosis and under-treatment is a challenge.

Treatment

Asthma cannot be cured but there are several treatments available. The most common treatment is to use an inhaler, which delivers medication directly to the lungs. Inhalers can help control the disease and enable people with asthma to enjoy a normal, active life.

There are two main types of inhaler:

- bronchodilators (such as salbutamol), that open the air passages and relieve symptoms; and
- steroids (such as beclometasone) that reduce inflammation in the air passages, which improves asthma symptoms and reduces the risk of severe asthma attacks and death.

People with asthma may need to use their inhaler every day. Their treatment will depend on the frequency of symptoms and the types of inhalers available.

Using an inhaler can be difficult, especially for children and during emergency situations. Using a spacer device makes it easier to use an aerosol inhaler. This helps the medicine to reach the lungs more easily. A spacer is a plastic container with a mouthpiece or mask at one end and a hole for the inhaler in the other. A homemade spacer, made from a 500ml plastic bottle, can be as effective as commercially manufactured spacers.

Access to inhalers is a problem in many countries. In 2021, bronchodilators were available in public primary health care facilities in half of low- and low-middle income countries, and steroid inhalers available in one third.

It is also important to raise community awareness to reduce the myths and stigma associated with asthma in some settings.

Self-care

People with asthma and their families need education to understand more about their asthma. This includes their treatment options, triggers to avoid, and how to manage their symptoms at home.

It is important for people with asthma to know how to increase their treatment when their symptoms are worsening to avoid a serious attack. Healthcare providers may give an asthma action plan to help people with asthma to take greater control of their treatment.

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Original Article

Urethroplasty in Paediatric Patients

Comparison of Urethrocutaneous Fistula Formation in Continuous Versus Interrupted Suture Techniques in Tubularized Incised Plate Urethroplasty in Paediatric Patients: A Randomized Controlled Trial

Ikramullah, Samreen Jamil, Haseeb Masood, Muhammad Shahzaib Akmal and Muhammad Saleem

ABSTRACT

Objective: To compare the incidence of urethrocutaneous fistula following tubularized incised plate urethroplasty (TIPU) using continuous versus interrupted sub-epithelial suture techniques in pediatric patients.
Study Design: Randomized Controlled Trial study
Place and Duration of Study: This study was conducted at the Department of Paediatric Surgery, Allied Hospital, Faisalabad, from December 28, 2022 to June 27, 2023.
Methods: Eighty male children (ages 3–10) with distal hypospadias were enrolled through consecutive sampling and randomly assigned to continuous (Group A) or interrupted (Group B) subepithelial PDS 7/0 suturing. All surgeries were performed by a single consultant. Patients were hospitalized for 7 days with catheter removal on the final day. Follow-up was done at one week and one month post-discharge. Urethrocutaneous fistula formation was the primary outcome. Data were analyzed using SPSS v25 with Chi-square test and stratification; $p \leq 0.05$ was considered significant.
Results: The frequency of urethrocutaneous fistula was 80% in Group A and 20% in Group B ($p = 0.002$).
Conclusion: Interrupted sub-epithelial suture technique in TIP urethroplasty showed a statistically significant trend toward fewer urethrocutaneous fistulas compared to the continuous method. These findings support further investigation in larger, multicenter trials to confirm clinical benefit.
Key Words: Hypospadias, TIPU, Urethrocutaneous fistula, Continuous sutures, Interrupted sutures.

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INTRODUCTION

The management of hypospadias, a common congenital anomaly affecting males characterized by a ventral urethral opening, often involves surgical correction through various urethroplasty techniques. Among the different approaches, tubularized incised plate urethroplasty (TIPU) has gained prominence due to its favorable outcomes. However, complications such as urethrocutaneous fistula formation remain significant concerns postoperatively. Suture technique—continuous vs. interrupted—plays a key role in outcome impacting both operative time and fistula risk.

Continuous sutures involve a single thread running along the tissue, creating an uninterrupted line of support. This technique is often appreciated for its efficiency in terms of time and material usage, potentially reducing the total suture length needed for closure[1,2]. Some studies suggest that continuous suturing can yield enhanced tensile strength at the incision site, which is especially critical for maintaining the integrity of the urethra during the immediate postoperative phase. For instance, certain biomechanical studies indicate that continuous sutures may provide superior strength compared to interrupted sutures, particularly when stitch length is optimized relative to wound length, potentially leading to improved healing outcomes[3,4]. Additionally, the intraoperative simplicity of continuous sutures may contribute to reduced surgical time, which is beneficial in pediatric patients, as minimizing anesthesia time is often a priority.

In contrast, the interrupted suture technique involves distinct, separate stitches anchored at specific points along the incision. This traditional method is favored by

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many surgeons due to its perceived ability to provide independent support to each segment of the tissue, potentially allowing for greater tissue resilience[5,6]. Some studies suggest that the modular nature of interrupted sutures facilitates adjustments during surgery, enabling the surgeon to manage tension and alignment incrementally. It has been hypothesized that the individual knots of interrupted sutures can contribute to more secure tissue adhesion, potentially reducing the risk of postoperative complications such as fistula formation[7].

Pediatric urethroplasty requires context-specific evaluation, as delicate tissues may respond differently. Some studies suggest continuous sutures reduce fistula rates in children, while interrupted sutures may be preferred when precise tension control is needed[8].

A systematic review by Borkar et al. found a lower incidence of UCF with interrupted sutures in Snodgrass urethroplasty, likely due to better suture line stability. In contrast, continuous sutures may increase tension and the risk of complications[9,10].

Clinical experience suggests that interrupted sutures offer better wound edge control, reducing strain and improving closure precision, which may lower the risk of ischemia and necrosis. Studies also show that using PDS in interrupted techniques results in fewer urethrocutaneous fistulas than continuous sutures[11,12].

Recent literature emphasizes the significance of suture technique on functional outcomes following urethroplasties. Research by Ullah et al. indicates that using interrupted sutures not only leads to fewer postoperative complications, including UCF, but also improves cosmetic outcomes and overall patient satisfaction[13]. The dynamics of wound healing associated with interrupted suturing may be attributed to intermittent tissue apposition, allowing for adequate blood flow and reducing the risk of ischemic complications that can arise with continuous sutures[10,14].

Moreover, varying suture techniques, including running versus interrupted sutures, can significantly affect postoperative continence and stricture rates following urethroplasty procedures[15]. Their meta-analysis reveals a strong correlation between interrupted suturing and decreased complications, affirming that this technique not only reduces UCF formation but also enhances functional outcomes related to urinary continence and stricture rates.

UCFs significantly impact patient morbidity and often require secondary interventions, many of which may be preventable with careful suture selection. Interrupted suturing is preferred, particularly in high-risk cases, due to its association with fewer complications[16,17].

Despite advancements in hypospadias surgery, a practical gap remains in comparing suture techniques. This study aims to address this by evaluating continuous versus interrupted sutures in Snodgrass urethroplasty, focusing on UCF formation to help guide best practices.

Hypothesis: There is a significant difference in urethrocutaneous fistula (UCF) formation rates between continuous and interrupted suturing techniques in tubularized incised plate urethroplasty (TIPU).

METHODS

This randomized controlled trial was conducted in the Department of Paediatric Surgery, Allied Hospital Faisalabad, from December 28, 2022, to June 27, 2023, after obtaining approval from the hospital's ethics committee. Informed consent was taken from the parents of all participants. A total of 80 male patients aged 3–10 years with distal hypospadias were enrolled through non-probability consecutive sampling and randomly assigned to two groups. Group A underwent tubularized incised plate urethroplasty using continuous subepithelial PDS 7/0 sutures, while Group B received the same procedure using interrupted sutures.

Exclusion criteria included prior hypospadias repair, moderate to severe chordee, ambiguous genitalia, and associated anomalies. All surgeries were performed by the same consultant surgeon. Patients were admitted for seven days postoperatively, with catheter removal on day seven. Follow-up assessments for urethrocutaneous fistula were done at one week and one month after discharge. Demographic and clinical data were recorded in a structured proforma. Statistical analysis was performed using SPSS version 25. Chi-square test was applied to compare fistula rates between groups, with $p \leq 0.05$ considered significant. Stratification by age and BMI was also performed to control for effect modifiers.

RESULTS

Table No.1: Descriptive statistics of age of patients

		Groups	
		Group A	**Group B**
Age (years)	N	**40**	**40**
	Mean	6.43	6.68

Table No.2: Descriptive statistics of BMI of the patients

		Groups	
		Group A	**Group B**
BMI	N	**40**	**40**
	Mean	24.25	24.30
	Standard Deviation	1.26	1.22
	Minimum	22.00	22.00
	Maximum	26.00	26.00

A total of 80 cases (40 in two equal groups) fulfilling the inclusion/exclusion criteria were enrolled to compare the frequency of urethrocutaneous fistula formation in continuous and interrupted suture tubularized incised plate urethroplasty presenting to Paediatric Surgery department Allied Hospital Faisalabad.

Descriptive statistics of age of patients shows that mean age in Group A was 6.43±1.99 and in Group B 6.68±1.91 in Group B, minimum value as 3.00 years and maximum age was 10.00 in both groups. (Table 1).

Descriptive statistics of BMI of the patients shows that mean BMI in Group A was 24.25±1.26 and in Group B 24.30±1.22 in Group B, minimum value as 22.00 and maximum BMI was 26.00 in both groups. (Table 2)

Comparison the frequency of urethrocutaneous fistula formation in continuous and interrupted suture tubularized incised plate urethroplasty shows 16(80%) in Group A and 4(20%) in Group-B, p-value was 0.002 showing a significant difference. (Table 3)

Table No.3: Comparison the frequency of urethrocutaneous fistula formation in continuous and interrupted suture tubularized incised plate urethroplasty

		Groups	
		Group A	**Group B**
Urethrocutaneous Fistula	No	**40**	**40**
	Yes	16	4
	%	80%	20%
	No	24	36
	%	40%	60%

P value: 0.002

Table No.4: Comparison of frequency of urethrocutaneous fistula formation in continuous and interrupted suture tubularized incised plate urethroplasty by age

Age		**Group**		**Total**	**P value**
		Group A	**Group B**		
2-5	Yes	4	0	4	0.098
		100.0%	0.0%	100.0%	
	No	9	9	18	
		50.0%	50.0%	100.0%	
6-10	Yes	12	4	16	0.008
		75.0%	25.0%	100.0%	
	No	15	27	42	
		35.7%	64.3%	100.0%	

Table No.5: Comparison the frequency of urethrocutaneous fistula formation in continuous and interrupted suture tubularized incised plate urethroplasty by BMI

BMI		**Group**		**Total**	**P value**
		Group A	**Group B**		
22-25	Yes	13	2	15	0.001
		86.7%	13.3%	100.0%	
	No	20	31	51	
		39.2%	60.8%	100.0%	
>25	Yes	3	2	5	0.500
		60%	40%	100.0%	
	No	4	5	9	
		44.4%	55.6%	100.0%	

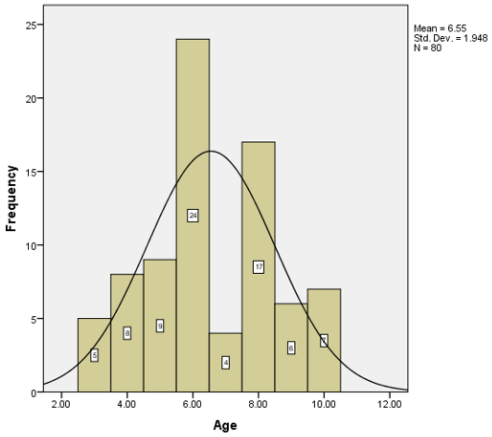

Figure No.1: Descriptive statistics of the patients

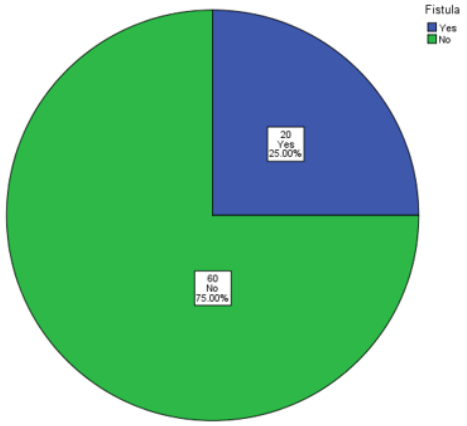

Figure No.2: Comparison the frequency of urethrocutaneous fistula formation in continuous and interrupted suture tubularized incised plate urethroplasty

Stratification was done for effect modifiers like age and BMI. Post stratification Chi-square test was applied. p-value ≤ 0.05 was taken as significant. (Table 4-5)

DISCUSSION

Hypospadias is a prevalent congenital condition affecting males. Snodgrass urethroplasty is widely regarded as one of the most effective methods for addressing distal and mid hypospadias. While pediatric surgeons generally agree on the use of absorbable sutures for urethroplasty, there remains a lack of standardized guidelines regarding the specific suturing techniques—interrupted suturing (IS) versus continuous suturing (CS)—for the construction of the neourethra during Snodgrass urethroplasty[18].

The mean age of patients in Group A was 6.43+1.99, while the mean age of Group B was 6.68+1.91. The frequency of urethrocutaneous fistula formation in continuous and interrupted suture tubularized incised plate urethroplasty was compared to 16 (80%) in Group A and 4 (20%) in Group-B, with a p-value of 0.002 indicating a significant contrast.

An earlier investigation comparing the results of interrupted versus continuous suture techniques in tubularized incised plate urethroplasty was carried out at Bangabandhu Sheikh Mujib Medical University (BSMMU). Six out of sixteen (37.5%) patients experienced urethrocutaneous fistulas following continuous technique tubularized incised plate urethroplasty, whereas two out of sixteen (12.5%) patients experienced urethrocutaneous fistulas following interrupted technique urethroplasty. The findings align with our research.

According to El-Sherbiny et al[19], suturing technique was a substantial risk factor that could have an impact on how well hypospadias healing went. In contrast to an interrupted suturing technique (9%), they discovered that the use of a flowing suture was substantially linked to a greater fistula rate (23%).

Interrupted suture technique is considered superior in tubularized incised plate urethroplasty (TIPU) due to its potential to minimize urethrocutaneous fistulae formation, a common complication after hypospadias repair.

Urethrocutaneous fistula is a key complication in TIPU, and several studies suggest that suture technique plays a significant role. Mahmud et al. reported lower fistula rates with interrupted sutures due to improved tissue approximation and vascularity[20]. Another researcher noted that this technique enables better edge adjustment, enhancing outcomes. Similarly, Gupta et al. found a lower incidence of fistulae with interrupted sutures in a prospective study.[10]

Interrupted sutures distribute tension independently, which is particularly beneficial in delicate tissue of urethra, while continuous sutures may compromise blood flow, increasing ischemia risk and fistula formation.

In addition to the direct impact on fistula rates, the interrupted suture technique is often associated with a more meticulous approach to tissue handling. As highlighted by Subihardi, the choice of suture technique can significantly affect the overall outcomes of urethroplasty, with interrupted sutures allowing for more precise control during the closure process[18]. This precision is critical in the context of TIPU, where the integrity of the neourethra is paramount to prevent complications.

Furthermore, while continuous sutures may reduce operative time, the potential increase in complications such as urethrocutaneous fistulae may outweigh the benefits of speed[10]. The interrupted technique, although potentially more time-consuming, may ultimately lead to better long-term outcomes, including lower rates of reoperation due to complications.

One limitation of our study is the potential loss to follow-up, as urethrocutaneous fistulas can develop even after the designated follow-up period. Additionally, the small sample size in both groups reduces the study's statistical power, indicating a need for further research with larger cohorts to validate these findings. Our study's findings indicate a difference in the rate of urethrocutaneous fistulas between tubularized incised plate urethroplasty performed with continuous versus interrupted suturing techniques

CONCLUSION

Interrupted suturing technique has significantly lower chances of urethrocutaneous fistula in tubularized incised plate urethroplasty when compared with continuous suturing technique.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Ikramullah, Samreen Jamil, Haseeb Masood
Drafting or Revising Critically:	Muhammad Shahzaib Akmal, Muhammad Saleem
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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Original Article

Evaluating the Social Integration and Emotional Health of Children Post-Strabismus Surgery

Afzal Qadir, Muhammad Ashraf, Lyla Shamim and Noor ul Hussain

ABSTRACT

Objective: To investigate the results of strabismus surgery on social integration and emotional well-being in children.

Study Design: Prospective cohort study

Place and Duration of Study: This study was conducted at the Department of Ophthalmology, Hayatabad Medical Complex, Peshawar over the course of two years, between January 2023 and December 2024.

Methods: This prospective cohort study at a tertiary care center in Pakistan included 90 children (4-16 years) undergoing strabismus surgery. Psychosocial outcomes were assessed preoperatively and at 3/6-month follow-ups using PedsQL and SDQ questionnaires. Statistical analysis included paired t-tests and multivariate regression.

Results: Significant improvements were observed across all psychosocial domains ($p<0.001$). Emotional functioning scores increased from 62.4±15.2 to 82.3±10.5, while social functioning improved from 58.7±16.3 to 80.9±11.7. Parental reports confirmed reduced bullying (78.9%) and better school participation (85.6%). Younger age (≤10 years), esotropia, and smaller deviations predicted better outcomes ($p<0.05$).

Conclusion: Children who undergo strabismus surgery experience significant psychosocial gains, including improved emotional quality of life and enhanced social incorporation. Since early intervention is crucial, the integration of psychosocial care into strabismus practice guidelines is recommended.

Key Words: Paediatric strabismus, psychosocial outcomes, quality of life, social integration, emotional health

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INTRODUCTION

Strabismus, a misalignment of the eyes, is one of the most prevalent ocular disorders, affecting approximately 2–4% of the pediatric population globally[1]. More than a physical condition, strabismus has extensive psychosocial implications, especially during the early years of childhood when identity, relationship and emotional resilience are developing[2]. Strabismic children typically have difficulty with social integration, leading to peer rejection, bullying, and anxiousness to engage socially, all of which are known to reduce self-esteem and quality of life[3,4].

The psychosocial impact of strabismus is due mostly to public opinions about facial beauty and the ability to form eye contact, which play an important role in non-verbal communication and building interpersonal relationships[5]. Research suggests that children with prominent strabismus are more likely perceived to be less intelligent, less attractive, and less capable by peers and adults, and in turn, become stigmatized and socially withdrawn[6,7]. This stigmatization may lead to emotional disturbances including anxiety and depression and behavioral issues[8].

Surgical correction of strabismus is commonly performed for both the restoration of ocular alignment and binocular vision but also for cosmetic reasons, which may affect psychosocial results[9]. The improvement in appearance postoperatively often leads to improved peer acceptance as well as increased self-confidence in children[10,11]. Recent data show that strabismus surgery greatly improves health-related quality of life (HRQoL) in domains associated with social functioning and emotional well-being. However, these improvements are not always uniform, and factors such as age, sex, degree of preoperative misalignment, and comorbid psychiatric conditions can all impact the subjective outcomes experienced[12].

Current evidence on pediatric strabismus surgery is still limited concerning certain important aspects. Most research studies examine adults/adolescents from high-income countries; few studies sample younger children from low- and middle-income countries with potential higher social stigma and limited treatment access. Moreover, although the visual and cosmetic benefits are

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well documented, there isn't enough evidence on psychosocial outcomes; the available studies tend to use generic quality-of-life measures instead of specifically assessing social integration and emotional health. This study fills these gaps by robustly assessing the effect of surgical correction on these key psychosocial domains in a low-resource setting.

METHODS

It was a prospective observational cohort study, carried out at the Department of Ophthalmology, Hayatabad Medical Complex, Peshawar; a tertiary care referral center in Khyber Pakhtunkhwa, Pakistan. The study was conducted over the course of two years, between Jan 2023 and Dec 2024. An IRB ethical approval was taken from Hayatabad medical complex before conducting this research. Parental or guardian written informed consent for all participants was obtained in conjunction with child assent, where appropriate.

The target population comprised all children aged from 4 to 16 years who underwent strabismus surgery during the study period. Inclusion criteria were horizontal strabismus (esotropia or exotropia) and no previous ocular surgery and able to engage in age-appropriate social and emotional assessments. Patients with developmental delays, autism spectrum disorder, congenital syndromes, or neurologic deficits that could confound the psychologic assessment, were excluded.

The sample size was calculated by using SPSS 25.0, based on an expected improvement in psychosocial QoL domains after strabismus surgery, as reported by Hatt et al[13], which reported a mean difference of 20 points on the IXTQ (standard deviation 25). At 95% confidence level and 80% power, the minimum required sample size was calculated as 72. The final sample size was set as 90 patients to accommodate for potential loss to follow-up (approximately 20%). Consecutive sampling method of non-probability type was applied. Children with eligible refractive error who presented for strabismus correction within the study period were approached for enrollment until the required sample size was achieved. Demographic and clinical information such as age, gender, type and degree of strabismus, visual acuity, refractive error and surgical details were recorded using a structured pro forma for data collection.

Two validated tools were used to assess social integration and emotional health:

Pediatric Quality of Life Inventory (PedsQL 4.0 – Psychosocial Health Summary Score) – Evaluates emotional functioning, social functioning, and school functioning.

Strengths and Difficulties Questionnaire (SDQ) – Captured emotional symptoms, peer problems, conduct issues, hyperactivity and prosocial behaviour.

Both measures were used in two of their transcreated versions in Urdu translated through the two-step backward translation process adapting to cultural contexts which had been previously validated for Pakistani pediatric populations.

Baseline (preoperative) measurements were obtained 1–2 weeks before surgery. Follow-up assessments were administered at 3 months and 6 months postoperatively using identical tools and conducted by trained clinical psychologists blinded to the surgical outcomes.

Surgical Technique: All patients underwent well-established recession–resection or bilateral medial/lateral rectus recession procedures under general anesthesia. Surgical type was determined according to the preoperative deviation angle and binocular vision assessment. The procedures were performed by consultant pediatric ophthalmologists, according to routine protocols.

Outcome Measures: The primary outcome was change in emotional health and social integration scores from preoperative baseline to postoperative follow-up. Secondary outcomes included:

Patient-reported physical functioning and peer interaction (PedsQL domains)

Reported incidence of bullying or social exclusion (SDQ peer problems scale)

Satisfaction reported by parents and perceived behavioral changes

Data Analysis: Data entry and analysis was done using SPSS version 26.0. Continuous variables were presented as means ± SD and categorical variables as frequencies and percentages. Depending on data distribution, paired t-tests or Wilcoxon signed-rank tests were applied to compare pre- and postoperative scores. Multivariate linear regression analysis was performed to determine predictors of postoperative psychosocial improvement, with the potential confounders of age, gender, baseline deviation angle and amblyopia accounted for. Statistical significance was considered at p-value <0.05.

RESULTS

A total of 90 children (mean age: 8.4 ± 3.2 years) who underwent strabismus surgery were included in the final analysis. The cohort comprised 52 males (57.8%) and 38 females (42.2%), with a predominance of esotropia (n = 54, 60%) over exotropia (n = 36, 40%). The mean preoperative angle of deviation was 35.2 ± 12.5 prism diopters (PD) for esotropia and 30.8 ± 10.7 PD for exotropia. Table-1.

Significant improvements were observed in all psychosocial health domains at both 3-month and 6-month follow-ups compared to baseline ($p < 0.001$). Table-2.

The SDQ indicated a notable reduction in emotional symptoms and peer problems, along with improved prosocial behavior following surgery. Table-3,

Table No.1: Baseline Demographic and Clinical Characteristics

Variable	Total (n = 90)	Esotropia (n = 54)	Exotropia (n = 36)	p-value
Age (years), mean ± SD	8.4 ± 3.2	7.9 ± 2.8	9.1 ± 3.5	0.072
Gender, n (%)				0.421
Male	52 (57.8)	30 (55.6)	22 (61.1)	
Female	38 (42.2)	24 (44.4)	14 (38.9)	
Preoperative deviation (PD)	33.5 ± 11.9	35.2 ± 12.5	30.8 ± 10.7	0.048
Amblyopia, n (%)	28 (31.1)	18 (33.3)	10 (27.8)	0.567
Refractive error, n (%)				0.213
Myopia	22 (24.4)	10 (18.5)	12 (33.3)	
Hyperopia	34 (37.8)	24 (44.4)	10 (27.8)	
Astigmatism	20 (22.2)	12 (22.2)	8 (22.2)	

Table 2: PedsQL Psychosocial Health Summary Scores (Mean ± SD)

Domain	Preoperative	3-Month Postop	6-Month Postop	p-value (Pre vs. 6M)
Emotional Functioning	62.4 ± 15.2	75.6 ± 12.8	82.3 ± 10.5	<0.001
Social Functioning	58.7 ± 16.3	72.4 ± 14.1	80.9 ± 11.7	<0.001
School Functioning	65.3 ± 14.8	74.1 ± 13.2	78.5 ± 12.0	<0.001
Total Psychosocial Score	62.1 ± 14.7	74.0 ± 12.5	80.6 ± 10.8	<0.001

Table No. 3: SDQ Scores (Mean ± SD)

Subscale	Preoperative	3-Month Postop	6-Month Postop	p-value (Pre vs. 6M)
Emotional Symptoms	4.8 ± 2.1	3.2 ± 1.7	2.5 ± 1.4	<0.001
Peer Problems	5.1 ± 2.3	3.5 ± 1.9	2.8 ± 1.6	<0.001
Conduct Problems	3.2 ± 1.8	2.9 ± 1.6	2.7 ± 1.5	0.083
Hyperactivity	4.0 ± 2.0	3.8 ± 1.9	3.6 ± 1.8	0.157
Prosocial Behavior	6.5 ± 2.2	7.8 ± 1.9	8.4 ± 1.7	<0.001

The majority of parents reported notable improvements in their children's social and academic experiences following strabismus surgery. Specifically, 89.5% of parents observed enhanced social interactions, indicating that their children were more engaged and confident in peer settings. Additionally, 78.9% of parents reported a reduction in bullying incidents, reflecting a positive shift in how their children were perceived and treated by others. Furthermore, 85.6% noted improvements in school performance and participation, suggesting that the psychosocial benefits of the surgery extended into academic domains as well.

A multivariate linear regression model identified lower preoperative quality of life scores, greater angle of deviation, and presence of esotropia as significant predictors of greater postoperative psychosocial improvement.

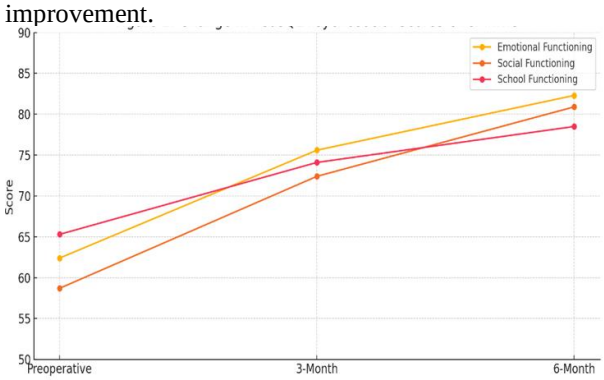

Figure No.1: Change in PedsQL Pschosocial Scores Over time.

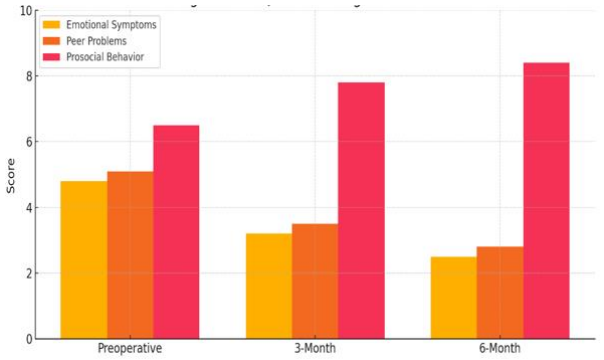

Figure No.2: SDQ Scores Changes Over time.

DISCUSSION

This prospective study investigated the effect of strabismus surgery on children's social integration and emotional health status using self-reported and parent reported outcome measures. The results show considerable postoperative improvement in psychosocial functioning and are in line with previous findings. The mean age of our cohort was 8.4 ± 3.2 years, with a slight male preponderance (57.8% male). Guler et al[14] found similar age distributions in his pediatric ophthalmologic study, that early treatment in childhood eye turning produces tremendous visual and psychosocial outcomes. Our gender distribution also accords with findings by Archer et al[15], where no important gender-specific disparities in surgical outcomes were found. The higher frequency of esotropia (60%) than exotropia (40%) observed in our population corroborates to similar findings reported by Mao et al[16], who showed that esotropic presentations are more prevalent among pediatric cohorts. While the preoperative deviation was slightly greater for esotropia than exotropia, this difference aligns with the clinical features reported by Yilmaz et al[12], thus confirming that the severity and angle of the deviation are significant variables that can affect surgical planning and outcome.

At both the 3-month and 6-month follow-ups, our Pediatric Quality of Life Inventory (PedsQL) scores

demonstrated significant improvement across emotional, social, and school functioning domains ($p < 0.001$). These findings also in line with the findings of Suzanne H et al[17], who reported significant psychosocial quality of life changes after surgical strabismus correction. The steady improvement from 62.1 to 80.6 in the total psychosocial domain over 2-wk intervals suggests that the benefits of strabismus surgery permeate into the child's social and academic life into the extended post-op period. By comparison, a study by Wang Y et al[18] noted rapid improvements in the initial 3 months with a plateau effect at later follow-ups. The sustained enhancement observed in our study might be due to a longer follow-up duration and culturally adapted instruments which may be able to observe subtle changes in the Pakistani pediatric population.

According to our findings from the Strengths and Difficulties Questionnaire (SDQ), patients report postoperative improvements in emotional symptoms, peer problems, and prosocial behavior. Such improvements correlate with the psychosocial benefits reported by Schuster et al[19] who observed that decreased social stigma and improved self-esteem resulting from corrective surgery promotes better emotional regulation in children. The consistency of these findings with existing research supports the hypothesis that the physical correction of strabismus can lead to enhanced emotional stability and social interactions. Conduct problems and hyperactivity scores tended towards improvement in our study but did not achieve statistical significance. Such a discrepancy is like the observations from Smith et al[20], highlighting that behavioral issues may need more adjunctive treatment or longer follow-up periods to detect significant changes.

According to the overwhelming majority of parents in our study, following surgery, their kids' social relations improved, bullying decreased, and their academic achievement rose. Almost 89.5% of parents reported better social interactions, 78.9% saw less bullying, and 85.6% saw better academic engagement with their children. The results of Superstein et al[21], who emphasized the indirect advantages of treating strabismus, such as increases in peer acceptance and self-esteem that translate into improved scholastic achievement, are consistent with such high parental satisfaction ratings. Subjective reports of clinical and parental outcomes are included in our data, which clearly suggests that surgical interventions have a three-dimensional impact on these kids that goes beyond the immediate visual function they offer and influences behavior and general well-being.

Our findings of lower preoperative quality of life scores, a larger angle of deviation, and a diagnosis of esotropia as significant predictors of greater postoperative psychosocial improvement, as demonstrated in our multivariate regression analysis, are consistent with previous reports. Wang Z et al[22] back these predictors, which imply that children who are more severely impaired preoperatively have a greater opportunity for psychosocial improvement afterwards. However, Ehlers et al[23], have shown differential outcomes depending on the type of strabismus and age at intervention. Outsources in both sample characteristics and social integration due to cultural factors need further consideration to explain evidence variability.

Despite our study's strong indications of psychosocial benefits linked to strabismus surgery, it is important to acknowledge a number of limitations. The lack of stratification based on surgical procedure type (recession–resection vs. bilateral recession) may limit the results seen, which is another factor the reader may want to take into account given the emphasis on observational data. Furthermore, additional evaluation is required to determine the long-term psychological stability, even though the 6-month follow-up period was adequate to identify early improvements. Future research should focus on longer follow-ups while taking into account the potential moderating effects of surgical technique and rehabilitation regimens.

CONCLUSION

Psychosocial quality of life following strabismus surgery was found to be superior to pre-operative levels, and indicated strong improvement across emotional, social, and school functioning domains. Overall, the results provide clear evidence that surgical correction of strabismus does not simply realign the eyes, but also alleviates the psychosocial handicap of the condition, resulting in less peer problems, greater self-esteem and improved academic functioning. Improved results were associated with younger age, presence of esotropia and smaller preoperative deviations, whereas amblyopia was limiting. These findings emphasize the need for early surgical correction of pediatric strabismus to ensure optimal functional development, as well as appropriate psychosocial development, especially in low-resource settings where social stigma may be particularly severe. This study promotes the idea of routinely including psychosocial evaluations during the postoperative management of children with strabismus so that they can be managed holistically.

Recommendations: Further randomized, multi-center studies with extended follow-up are recommended to validate and generalize these findings.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Afzal Qadir, Muhammad Ashraf
Drafting or Revising Critically:	Lyla Shamim, Noor ul Hussain
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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

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Original Article

Estimation of Stature from Percutaneous Tibial Length in Male Cadavers of the Lahore Population Aged 20-50 Years

Riasat Ali, Ahmad Raza Khan, Fariha Tariq, Khalid Mahmood, Aatiqa Abbas and Noreen Kashif

ABSTRACT

Objective: To determine the correlation coefficient between tibial length and body stature and regression model for estimation of body length from tibial length in males.

Study Design: Comparative cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Forensic Medicine and Toxicology KEMU, Lahore. The study duration was from January 2023 to November 2023.

Methods: In this study percutaneous tibial length was measured along with body length in 62 dead bodies (31 males). It was a comparative cross sectional study. Non probability consecutive sampling technique was used. It was carried out in Forensic Medicine & Toxicology Department of KEMU, Lahore.

Results: Data was analyzed by using SPSS version 26. Correlation coefficient was calculated between percutaneous tibial length and body length of dead bodies. Pearson correlation coeffient was 0.933 respectively. Regression equations were obtained along with regression lines.

Conclusion: Very strong statistically positive and significant results were found.

Key Words: Percutaneous tibial length, Body length, Correlation coefficient, Male Cadavers

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INTRODUCTION

Uniqueness means the quality of being only one of a kind. There is an innate attribute of every individual is to be treated with equality and respect. This inborn quality is basic component of uniqueness. Individuality means presentation of an individual' s uniqueness, which is constituted by two elements.[1] One is the ability to make decisions and then struggle to fulfill these decisions. This ability differentiates that individual from other living things. The second is someone's identity which is collection of certain features that give uniqueness. These are three types of features: inherent, acquired with passage of time and uniqueness, being awarded by the people among whom that person leads his life.[2] When a person dies, decision-making element is lost but the element of uniqueness remains there. Therefore, as a basic human right, the dead must be given identity.

Human beings can be uniquely identified through techniques like fingerprinting and DNA analysis.[3] In situations where bodies are mutilated or fragmented due to disasters or violence, identifying the deceased becomes crucial. Forensic methods that utilize both hard biometrics, such as fingerprints and retinal patterns, and soft biometrics, such as height and weight, play a vital role in this process.[4]

The measurement of stature has been practiced for centuries, with documented methods dating back to the late 19th century in France, where bone length was quantified separately for males and females.[4] These measurements were later used to develop regression equations for estimating height.[5] Studies conducted worldwide have consistently shown a strong positive correlation between long bone lengths, particularly the femur and tibia, and height.[6] The femur and tibia, being more robust than other bones like the humerus, provide more accurate measurements for height estimation, especially in fragmented or mutilated bodies.

Anthropometry, the measurement of body parts, has a long history and is used in various fields, including forensic science. It allows for the identification of individuals based on quantifiable qualities, which can change over time or due to pathological conditions.[7]

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The Bertillon system, developed in the 19th century, was one of the earliest methods to use body measurements for individualization.[8]

Height is a crucial biological trait that aids in the identification of individuals, especially in forensic contexts.[9] It helps narrow down the list of possible identities, although it may not always provide conclusive results. Factors such as genetics, nutrition, and environmental conditions influence stature. Research has shown that long bones, finger lengths, and arm spans all have strong correlations with height, making them useful for estimating stature in various populations.[10]

Forensic methods for estimating height from body parts include mathematical and anatomical approaches. The mathematical method, particularly regression analysis, is widely used and provides accurate results.[11] The tibia, a strong and resilient bone, is particularly important in forensic investigations due to its ability to withstand decay and environmental factors, making it a reliable indicator for estimating height in both living and deceased individuals.[12]

METHODS

It was a comparative cross-sectional study, conducted in the department of Forensic Medicine and Toxicology KEMU, Lahore. The study duration was from January 2023 to November 2023. The sample size of 31 males with age between 20-50 years as taken by using non-probability consecutive sampling technique. The data was analyzed by using SPSS version 26.0, descriptive data was showed as Mean±SD, Pearson correlation coefficient was driven between tibial length and dead body stature and linear regression was performed. The sample collection involved measuring percutaneous tibial length by marking the medial upper border of the condyle to the lower medial malleolus and using a spreading caliper to measure in centimeters. Stature was measured on the autopsy table by marking lines at the head and heel, then recording the distance between them.

Inclusion Criteria:

- Dead bodies with healthy normal limbs without any deformity or disease (local skin disease, ulcer).
- Age between 20 -50 years.

Exclusion Criteria:

- Fracture of tibia.
- Amputation of limb.
- Congenital anomalies of lower limb.
- Age below 20 years.
- Age above 50 years.

RESULTS

In current study 31 cadavers were brought to mortuary of Forensic Medicine & Toxicology Department of KEMU, Lahore. Descriptive statistics of body stature and tibial length of male samples is depicted in *Table 1*. Maximum, minimum value of tibial length was 53, 46 with mean and standard deviation of 49.6±82.34 cm. Minimum, maximum value of body stature was 165 ,182 with mean and standard deviation of 176.39±4.63cm. The results of regression coefficients i.e., constant and tibial length have values of 84.77,1.844 respectively. Their t values were 12.93 and 13.996 with 0.000 *p* values depicted in *Table 2* with regression equation of

$$Body\ Stature\ (Y) = 84.774 + 1.844\ Tibial\ length\ (X)$$

The correlation coefficient between tibial length and body stature for study samples (males) with r value of 0.933 and *p* value <0.001.

Table No.1: Statistics of tibial length and body stature

Variable	Minimum	Maximum	Mean ± SD
Tibial Length	46	53	49.68 ± 2.34
Body Stature	165	182	176.39 ± 4.63

Table No.2: regression model for tibial length

Variable	Regression Coefficient	t-statistic	*p*-value
Constant	84.774	12.937	.000
Tibial Length	1.844	13.996	.000

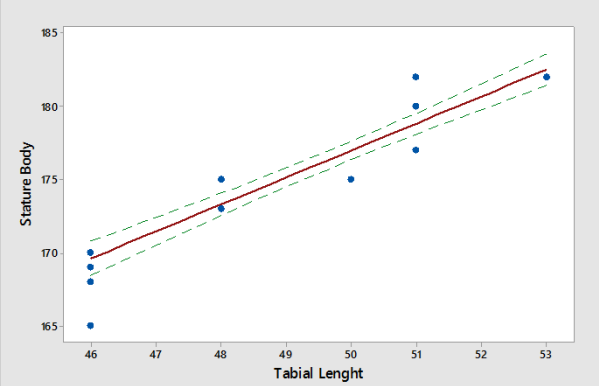

Figure No.1: Graphical representation of regression equation of study subjects.

DISCUSSION

Every person is born with a fundamental right of being so distinctive that his/her entity never ends till death. Rather it remains there even after death. This unmatched collection of characteristics is not only required in routine work but also in time of extreme need. Such extreme needs originate during catastrophic occurrences as floods, earth quack, bomb blast, war etc. Such occurrences enhance the working of personal identification experts.

Weather, family ties, community connections, food, cleanliness, and genetics all affect height. People in

different places therefore have different statures. In the current study, mean standing height for males was 176.39 cm, with a standard deviation of 4.63 cm(176.39±4.63cm). The minimum standing height was 165 cm, and the maximum was 182 cm. In contrast, research conducted in Punjab revealed that boys' average height was 170.5 cm,[13] whereas Lahore's average was 173.16 cm and the twin cities' average was 171 cm. The average male height in adjacent nations was 165.5 cm and 174.74 cm.[14] The average male height in Malaysia was 168.24 cm[15], whereas the average male height in Kosovo was 178.79 cm[16]. In Iranian males averaged height was 171 cm[17], Croatian males was 182.7 cm[18], and USA studies showed height of 169 cm for white males and 167.7 cm for Black males.[19]

The tibial length in males showed maximum value of 53 cm with a minimum value of 46 cm and a mean length of 49.68 cm with a standard deviation of 2.34 cm (49.68±2.34 cm). In the one of the previous studies in Belgium and Mexico, the results showed mean tibial length of 38.05 cm and 36.23 cm respectively.[20,21] The previous studies on cadavers showed a mean body length and tibial length of 164.02 cm and 35.99 cm respectively.[22] In Turkey, the study on male cadavers had a body length and tibial length of 170.4 cm and 36.9 cm respectively.[23] In Romania, a study showed a male mean body length and tibial length of 172.01 cm and 38.02 cm respectively. The correlation coefficient (r) between tibial length and body stature in the current study was 0.933, indicating a strong positive relationship, consistent with studies from India and Romania.[24-25]

In regression analysis, the equation for predicting male body stature was: **Body Stature (Y) = 84.774 + 1.844 Tibial Length (X)**. The relationship between tibial length and stature was statistically significant, with a t-value of 13.99 for tibial length and a p-value of 0.000.

CONCLUSION

Establishment of uniqueness is a basic need of medicolegal system. Various criteria have been used. Estimation of height can be done by various methods. Different body parts have been used to estimate body stature. The results of this study indicate that percutaneous tibial length can be utilized to develop regression equation. The value of Pearson correlation coefficient indicates that there exist a very strong positive and statistically significant correlation between percutaneous left tibial length and stature. This regression equation can be used to estimate body stature in dead bodies from percutaneous tibial length.

Author's Contribution:

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Final Approval of version:	All the above authors
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Original Article

Application of Modified SGNA (Subjective Global Nutritional Assessment) to Assess Malnutrition Status in Children with Transfusion-Dependent Thalassemia

Assess Malnutrition Status in Children with Transfusion

Suci Fitrianti[1], Ahmad Syauqy[1] and Syarief Darmawan[2]

ABSTRACT

Objective: To assess the malnutrition status of the children with thalassemia by Modified SGNA classification at Dr. Cipto Mangunkusumo Hospital Jakarta Indonesia.

Study Design: Prospective cohort study

Place and Duration of Study: This study was conducted at the Dr. Cipto Mangunkusumo Hospital Jakarta Indonesia from August – December 2023.

Methods: The children in this study are between the ages of 24 and 216 weeks, and they have hemoglobin A1c levels that are high enough to be detected by blood transfusions and hemoglobin D-levels determined by non-probabilistic sampling. Various anthropometric measurements, such as the Mean Upper Arm Circumference (MUAC) and waist circumference, were taken. The next step is to use the WHO Antro plus and pediTools lunak platforms to measure and classify the Z MUAC for age and height. The GI status is determined using the Global Sub-Evaluation Scale (SGNA) as normal, abnormal, or worse.

Results: Out of 120 participants ranging in age from 24 to 216 months, 55 were female and 65 were male, making up 54.16% of the total. The frequency of malnutrition due to SGNA alteration was shown to be significantly related to age in this study (p=0.005). Out of the 24-60 month age group, no severe malnutrition was detected, and 4 (33.33%) were moderately malnourished. In the group of 61–144 month olds, moderate malnutrition affected 34 (51.51%), whereas severe malnutrition affected 7 (10.61%). Thirteen children (or 33.33 percent) were significantly undernourished between the ages of 145 and 216 months, while another fourteen (33.33%) were moderately undernourished.

Conclusion: Children with thalassemia are at risk of malnutrition. Modified SGNA is used to assess malnutrition. The prevalence of malnutrition grows as people get older, regardless of gender.

Key Words: Malnutrition, SGNA, Thalassemia-dependent transfusion, MUAC, Nutritional status

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INTRODUCTION

Thalassemia is a hereditary blood disorder characterized by a disorder in the production of both alpha and beta globin chains and requires blood transfusions and iron chelation in its treatment [1,2]. Children with thalassemia are at risk of malnutrition due to impaired iron absorption, low dietary intake, increased energy requirement, and the effects of ongoing blood transfusion therapy[3–5]. Paediatric malnutrition is a condition resulting from poor growth due to an imbalance between nutrients consumed and those needed [6-8]. (SGNA) tools [9–11] can be used to evaluate malnutrition in children. The SGNA is a trustworthy and proven questionnaire that evaluates children's nutritional status. It goes beyond nutritional screening and offers a thorough evaluation of nutrition, incorporating a nutritional-focused medical record and a physical examination to find a global[12, 13, 16]. Anthropometric data, including changes in height and weight, are used by one of the SGNA tests to evaluate nutritional status[9,14]. Hepatosplenomegaly makes it improper to use body weight as a measure of nutritional status in children with thalassemia.

Hepatosplenomegaly can develop as a result of chronic liver disease or an overabundance of iron in the blood. The measurement of weight becomes erroneous due to this condition. An alternative to the weight-for-height

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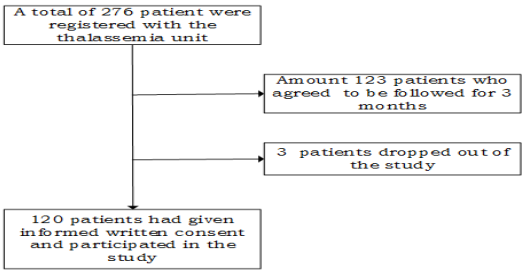
indicator that was missing from the first SGNA is the age-related change in mid-upper arm circumference (MUAC). When looking for signs of youth wasting in communities and healthcare facilities, the World Health Organization suggests measuring MUAC[15]. As a result, the researcher adjusted the original SGNA so it could be administered to thalassemia patients. A change was made by replacing the weight-for-height method with the mid-upper arm circumference Z-score. The primary objective of this study was to find out how common malnutrition is in children with transfusion-dependent thalassemia by using a modified SGNA to compare the nutritional status of boys and girls in each group.

METHODS

The Dr. Cipto Mangunkusumo National Referral Hospital in Jakarta, Indonesia served as the site of this prospective cohort study, which ran from August to December of 2023. The Ethic Committee of the University of Indonesia's Faculty of Medicine granted prior clearance (KET-875/UN2.F1/ETIK/PPM. 00.02/2023). Parents gave their informed permission before their 120 transfusion-dependent thalassaemic children, ranging in age from 24 to 216 months, could take part in the study. Thalassaemic children with mal-absorption disease, congenital abnormalities, chronic disease, patients who had a bone marrow transplant, patients with splenectomy, and have not gotten iron chelation therapy were excluded from this study. The disease history and blood transfusion were assessed by questionnaire during the interview with parents. The nutritional status was assessed with Subjective Global Nutritional Assessment (SGNA) Modification.

Height and other anthropometric measures taken monthly for three months, also MUAC of the subject were taken. Height measurement using stadiometer Seca type 217, MUAC measured using Seca type 201. The measurements were taken with international guidelines. Z-score category for height-for-age by WHO Anthro and WHO Anthro plus, MUAC used the Z-score category by WHO Anthro and peditools[16].

Statistical Analysis: The Statistical Package for the Social Sciences, version 27, was used for data analysis. Pearson correlation analysis for validity questionnaire SGNA modification and Cronbach Alpha method for reliability SGNA Modification, and using chi-square test was applied to compare qualitative data, and p-value less than 0.05 was taken as significant.



RESULTS

In all, 120 participants ranging in age from 24 to 216 months were a part of this investigation, in addition, the study involved 65 (54%) were male and 55 (45%) were female as the subjects. The subject was assessed for malnutrition status by SGNA modification. The SGNA modification questionnaire was tested for validity and reliability in children with thalassemia, out of 18 questions, only 11 were valid, including height percentile (<0,001), appropriate considering mid-parenteral height (<0,001), MUAC for age (<0,001), Serial MUAC (<0,001), MUAC reduction (<0,001), current intake versus usual, functional capacity, function in past 2 weeks (<0,001), lost of subcutaneous fat (<0,001), muscle wasting (<0,001) (Table 1)

Table No. 1: Validity and reliability of SGNA modification

Questionnaire SGNA Modification	p-Value
Height Percentile	<0,001*
Appropriate considering mid-parental height	<0,001*
Serial growth	0,493
MUAC for age	<0,001*
Serial MUAC	<0,001*
MUAC reduction	<0,001*
Change in the past 2 weeks	<0,001*
Adequacy of dietary intake	0,104
Current intake versus usual	0,024*
Duration of change	0,159
Gastrointestinal Symptoms	0,236
Duration of symptom	0,761
Functional capacity (nutritionally related)	<0,001*
Function in past 2 weeks	<0,001*
Metabolic Stress of Disease	-
Loss of subcutaneous fat	<0,001*
Muscle wasting	<0,001*
Eema (Nutrition-Related)	-
Cronbach's Alpha	0,794

* = (p<0.05)

This study involved 120 cases in the age range of 24-60 months, 61-144 months, and 145-216 months. According to the findings, 12 cases at the age of 24-60 months, consisting of 7 males (58.33%) and 5 females (41.66%) the majority had normal nutritional status 8 (66.66%), moderate malnutrition 4 (33.33%) and no severe malnutrition was found. At 61-144 months, 40 children (60.60%) were male and 26 (39.39%) were female. In this age group, the majority of children were malnourished 41 children (62.12%) consisting of moderate malnutrition 34 (51.51%), and severe malnutrition 7 (10.61%). In the 145–216-month age group, there were 18 (42.87%) males and 24 (57.14%) females. In this age group, 14 cases (33.33%) of

moderate malnutrition and 14 cases (33.33%) were found to be severely malnourished compared to other age groups. There was an increase in severe malnutrition by 33.33% in older children. (Table 2)

Table No. 2: Malnutrition Status of 24-216 months old thalassemic children based on SGNA modification

SGNA category	24-60 months (n = 12)			61 -144 months (n = 66)			145-216 months (n = 42)			Total Cases 120		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
Normal	6 (85.7)	2 (40)	8 (66.7)	16 (40)	9 (34.6)	25 (37.9)	2 (11.1)	12 (50)	14 (33.3)	24 (36.9)	23 (41.8)	47 (39.2)
Moderate malnutrition	1 (14.3)	3 (60)	4 (33.3)	19 (47.5)	15 (57.7)	34 (51.5)	7 (38.9)	7 (29.2)	14 (33.3)	27 (41.5)	25 (45.5)	52 (43.3)
Sever malnutrition	0	0	0	5 (12.5)	2 (7.7)	7 (10.6)	9 (50)	5 (20.8)	14 (33.3)	14 (21.5)	7 (12.7)	21 (17.5)
Total	7	5	12	40	26	66	18	24	42	65	55	120

Chi-square (p=0.005)

DISCUSSION

The difference between the existing SGNA and the modification is the indicator of the appropriateness of current weight for height (wasting) is replaced with MUAC (Middle Upper Arm Circumference). Splenomegaly is a common condition in children with thalassemia. This condition makes body weight indicators inaccurate[17]. MUAC Z-score height and body mass index (BMI) can be utilized to evaluate dietary status as an alternative to weight. The MUAC Z-score is a measure of the percentage of fat and muscle in a given body. Body mass index and weight-for-length were shown to be substantially linked with MUAC. MUAC is a more accurate predictor of death than weight-for-age Z-score19, and it is a straightforward and efficient way to evaluate malnutrition. Similar rates of severe acute malnutrition in toddlers were found in another investigation that counted by MUAC (11,2%) and weight for height (11%)[20].

This study showed that malnutrition is a very common problem in thalassemia. There were 73 (52.1%) malnutrition with detail 52 (43.3%) moderate malnutrition and 21(17.5%) severe malnutrition. This figure is higher than the previous study which showed a malnutrition prevalence of 42%[21] until 48.2%[1]. Other study shown 22 research about Undernutrition is more common in lower-middle income countries (e.g., India, Pakistan, Iran, and Egypt) than in high-middle or high-income countries (e.g., Turkey, Greece, North America, USA, and Canada). The prevalence of undernutrition varies greatly among the 12 countries studied, ranging from 5.2% to 70%.

The prevalence of malnutrition was significantly related to participants' ages in our study (p=0.005). This result is similar to that conducted by a researcher who found a significant association between age and wasting and also a study by Joshi et al (2023) who stated there was an association between age and nutritional status[3].

In our study, increasing tendency for malnutrition with increasing age In the elderly, there is a greater prevalence of mild to severe malnutrition. Several factors may explain this tendency, including:

Increased energy requirement: Children with thalassemia have energy requirements that are approximately 30-50% higher than those of healthy children[4]. As they grow older, their energy needs continue to rise. However, inadequate nutritional intake may lead to an energy imbalance, ultimately contributing to malnutrition.

Impact of chronic anemia: Chronic anemia experienced by children with thalassemia results in reduced appetite leading to insufficient energy intake[23] and also decreased efficiency in nutrient absorption and utilization. This condition can lead to impaired growth and more significant weight deficits, particularly in older age groups.

Iron Overload due to regular transfusions

Routine blood transfusions can cause an overabundance of iron in the blood. Iron excess adversely affects as function about vital organs, including the liver and endocrine glands, which play crucial roles in growth and metabolism. Consequently, this contributes to stunted growth and an increased risk of malnutrition in older children[24].

Splenomegaly: Splenomegaly, a common condition in children with thalassemia, may cause early satiety, leading to reduced food intake. Splenomegaly also increases metabolic activity as a result of hematopoiesis that does not occur in the bone marrow, a process outside of the medulla. This condition elevates energy and nutrient requirements. Studies have shown that children with splenomegaly have a higher risk of malnutrition[1].

CONCLUSION

The danger of malnutrition increases for children with thalassemia. Modified SGNA is used to assess malnutrition in thalassemia children who commonly have organomegaly (splenomegaly and hepatomegaly). The prevalence of malnutrition increases with advancing age irrespective of sex. This finding

highlights that enhanced nutritional interventions must be implemented for older age groups. A more intensive approach, including regular nutritional monitoring, and education on a balanced diet is essential to mitigate the risk of malnutrition and improve the overall quality of life for transfusion-dependent children with thalassemia.

Author's Contribution:

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Agreement to accountable for all aspects of work:	All the above authors

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Original Article

Evaluation and Assessment of the Anatomic Variations of Retromolar Pad in Edentulous Patients

Gohar Ali, Muhammad Aamir Ghafoor Chaudhary, Hira Riaz, Hadee Aziz, Noor Fatima and Hania Noor

ABSTRACT

Objective: To evaluate mandibular casts in order to classify and assess morphologic differences of the retromolar pad within a selected age group of completely edentulous patients. Also to highlight the significance of retromolar pad in the field of prosthodontics and its clinical relevance in complete denture fabrication.

Study Design: Cross-sectional observational study

Place and Duration of Study: This study was conducted at the Department of Prosthodontics, Islamic International Dental Hospital, Islamabad over a period of six months from January 1st to June 30th in the year 2024.

Methods: A cross-sectional observational study was conducted, including a sample of one hundred and twenty completely edentulous patients. Functional impressions were taken by a prosthodontist to fabricate mandibular casts. The shapes of the retromolar pad were determined with the help of diagnostic markings and were classified as; pear-shaped, triangular shaped, and round shaped. Chi-square and One-Way ANOVA test was performed to review data in relation to gender and age, respectively.

Results: Results suggested that pear-shaped retromolar pad was most frequently observed (54.2%), followed by the triangular shape (29.2%), while the round shape was the least common observed (16.7%). Moreover, the gender and age had no significant influence on the variation in shapes of the retromolar pad ($p < 0.05$).

Conclusion: The present study concluded that the pear-shaped retromolar pad is the most prevalent morphological type among completely edentulous patients. There was no statistically significant difference in the shape of retromolar pads with age, side and gender.

Key Words: Mandibular, Edentulous, Resorption, Occlusion, Impressions, Gender

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INTRODUCTION

The retromolar pad, also known as the piriformis papilla, is a key anatomical feature in the oral cavity, particularly in edentulous patients. [1,2] It acts as a significant intraoral landmark in complete denture prosthodontics, aiding in the restoration of a completely edentulous mouth. Retromolar pad functions as both a supporting and limiting area of the mandibular arch.[3] Located distal to the mandibular third molar, it is a mass of elevated soft tissue with glandular elements, covering the retromolar triangle.[2,4,5] The surface epithelium of the retromolar pad can be divided into two parts; anterior keratinized epithelium and posterior non-keratinized epithelium.[6]

Anatomically, the retromolar pad is bound by several muscles and tendinous structures.[2] Bordered posteriorly by the terminal ends of the temporalis tendon, laterally by the buccinator muscle, medially by the pterygomandibular raphe as well as the superior constrictor muscle of pharynx, and anteriorly it is bound by the masseter muscle.[1,7,8] Following the loss of molar, resorption and remodelling of the alveolar bone and soft tissues is observed especially in the mandibular ridge.[1,9] Residual ridge resorption results in blending of the resorbed tissues with the retromolar pad. In the mandibular arch, bone resorption does not extend beyond the buccal shelf, mylohyoid ridge, and their associated muscles, because these help limit chronic bone resorption.[6] The retromolar pad itself resists resorption due to underlying dense cortical bone, serving as a stable landmark for posterior denture extension.[1,5,6,9] The retromolar pad also protects lingual nerve from iatrogenic injury.[10]

Ensuring adequate coverage of the retromolar pad and buccal shelf areas is necessary for primary support in complete dentures. Since these regions contain

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muscular elements, it is important to avoid excessive pressure during denture fitting.[1] Shape and size of retromolar pad critically influences the posterior marginal seal of the mandibular denture, preventing food accumulation beneath the denture and enhancing comfort and fit.[1,6] A reduction in peripheral seal significantly reduces mandibular denture stability.[11]

Shah observed that in majority cases, the retromolar pad's bottom third and mandibular posterior occlusal plane correspond consistently.[6] Since anatomically the retromolar pad is divided into anterior two-third and posterior one-third, it is generally recommended that the posterior occlusal plane should be aligned with the anterior two-third of retromolar pad which is firm and fibrous.[2,9,12,13] According to Khan NM and colleagues, the interpupillary line along with the retromolar pad area serves as a reliable anatomical reference in establishing the occlusal plane in complete denture fabrication.[14] Proper occlusal plane alignment ensures good function, while misalignment may compromise the denture stability and accelerate bone resorption.

Despite its importance, limited research exists on the morphological and dimensional variations of the retromolar pad.[8] Previous studies[1], were based on observation and categorized retromolar pad as pear, triangular and round shaped. Understanding these variations is crucial, as they can significantly influence the stability, peripheral seal, and overall mandibular dentures' fit. The prime objective of current study was to determine prosthetic significance of various shapes of the retromolar pad following molar loss, providing valuable insights that aid prosthodontists in designing and fabricating dentures that enhance retention, support, and stability for edentulous patients.

METHODS

A cross-sectional observational study was conducted at the Department of Prosthodontics, Islamic International Dental Hospital, Islamabad, Pakistan. The study spanned over a period of six months, from January 1st, 2024, to June 30th, 2024, with a sample size of one hundred and twenty completely edentulous participants including both males and females.

A prosthodontist took the functional impressions of the patients' lower arches with impression compound, cake form. Diagnostic casts were prepared using the dental plaster material (type 3). Retromolar pads of both right and left sides were traced with indelible pencil on the mandibular casts. Upon further analysis three shapes of retromolar pad were observed: pear-shape, triangular shape and round shape.

Selection criteria: In order to ensure eligibility of the participants, the research population was selected based on a specified inclusion and exclusion criteria. The inclusion criteria consisted of male and female patients aged 55 to 70 years who had well-formed mandibular ridges, patients with intact neuromuscular coordination, and those with properly extended impression covering the retromolar pad. To enhance result reliability, specific exclusion criteria were implemented. Patients not falling in mentioned age range were excluded. Additionally, the impressions with inadequate extension over the retromolar pad and patients with history of mandibular hemi mandibulectomy were also not included in the study.

Ethical issues: The permission to collect data and conduct research was approved by the Riphah International University Ethical Committee (Ref. No. IIDC/IRC/2023/12/065 Dated 16th December 2023). Informed verbal consent was obtained prior to the study, and personal information of participants was kept confidential. The study followed the national and ethical guidelines of the institute.

Statistical analysis: Statistical analysis was conducted using IBM SPSS version 22 for windows. Categorical variables: retromolar pad shapes and gender were expressed as frequencies and percentages The Chi-Square test was applied to assess the relationship between gender, and the shape of the retromolar pad. One-Way ANOVA test was performed for comparing the mean age among individuals and the different shapes of retromolar pads. Graphs and tables were created using Microsoft Excel.

RESULTS

Descriptive analysis of the study group and their graphic representation was performed using MS Excel, while complex statistical tests were performed using SPSS version 22 for windows. A confidence interval was 95% and a margin of error was 5%. Table 1 presents the number and percentages of male and female participants in this study.

Table No.1: Participants Demographics

Gender	Number of Participants	Percentage (%)
Male	59	49.2%
Female	61	50.8%
Total	**120**	**100%**

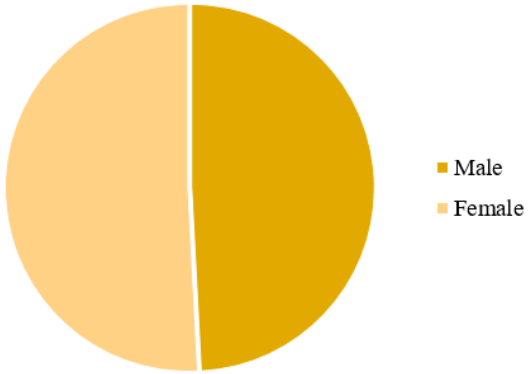

Figure No.1: Participants Demographics

Figure 1 shows that the overall distribution of shapes between genders was relatively balanced with a total of 59 males and 61 females across all shapes. Table 2 and Figure 2 present the frequency and correlation of the identified shapes among edentulous patients. The frequencies were balanced across genders and consistent on both sides of the mandibular ridge.

Table No.2: Frequency Distribution of Retromolar Pad shape in Edentulous Patients

Shape of Retromolar Pad	Frequency (n)	Percentage (%)
Pear	65	54.2%
Triangular	35	29.2%
Round	20	16.7%

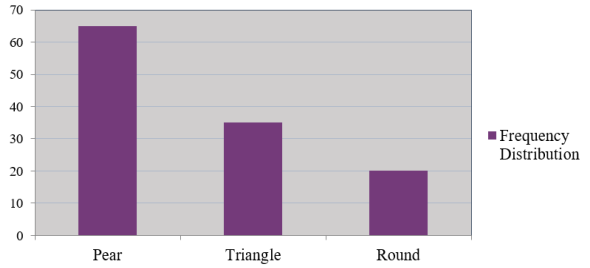

Figure No.2: Frequency distribution of various shape of retromolar pad

Table 3 indicates the distribution of the shapes of the retromolar pad among the population under study with respect to gender.

Table No.3: Gender-wise distribution of shape of retromolar pad

	Shape of Retromolar Pad			Total
	Pear	Triangular	Round	
Male	32	20	7	59
Female	33	15	13	61

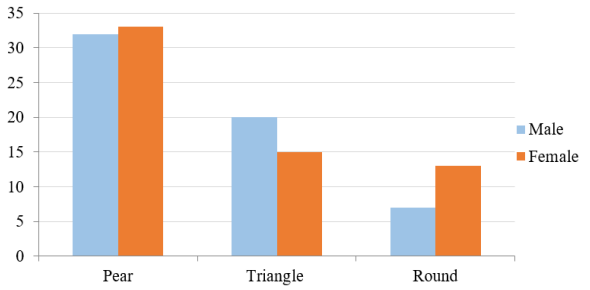

Figure No.3: Distribution of shape of retromolar pad gender wise.

Figure 3 showed the prevalence of the different shapes of retromolar pad; pear shaped, triangular and round, among both genders. It was noted that pear shape had a similar prevalence among both genders (32 males and 33 females), triangular shape was more frequent in males (20) the round shape occurred consistently much more in females[13].

It was found that gender does not significantly influence the shape of the retromolar pad in this sample. To correlate between gender and the shape of the retromolar pad, Chi-Square test for independence was conducted. The test yielded a Chi-Square statistic (X^2) of 2.50 and a p-value of 0.29 ($p > 0.05$), demonstrating that there is no significant association between gender and the shape of the retromolar pad.

Study also implies that variations in retromolar pad shape do not appear to be influenced by age differences in the studied population. The results drawn through One-Way ANOVA revealed a p-value of 0.14, which exceeds significance threshold of 0.05. As a result, the findings indicate that the difference in mean age between the groups is statistically insignificant.

DISCUSSION

Bone resorption consequent to the third molar extraction leads to a limited remodelling in the retromolar pad area due to presence of ligaments and muscle attachments. This causes retromolar pad to remain a stable reference point, even in resorbed ridges. Factors like genetics, health, and systemic conditions can cause anatomical variations in its shape and size. In the present study, the pear shape retromolar pad appeared to be the most frequent, followed triangular and round forms. The morphology of retromolar pad may offer valuable insights into age, ridge form, and other clinical parameters in edentulous individuals.

Our ongoing investigation analysed the morphological characteristics of the retromolar pad, identifying 54.16% as pear-shaped, 29.16% as triangular, and 16.68% as round. The study aimed to assess the outcomes of a complete denture fabrication to assist prosthodontists in designing and fabricating dentures that enhance retention, support, and stability for edentulous patients.

The findings outlined in the parent article, conducted in Lahore, Pakistan suggest notable variation in the shapes of retromolar pad in completely edentulous patient.[15] The conclusion was that, among the various shapes, the triangular and pear shaped retromolar pads exhibited a larger surface area compared to the round shape.

Nazia and her team conducted a cross-sectional study on the Kashmiri population and inferred that the pear and triangular shaped retromolar pads offer improved stability for lower dentures due to their larger surface area in contrast to the round shape, which provides comparatively less support. The statistics revealed that the pear shaped retromolar pad was the most common (55%), followed by the triangular (29.4%) and the round (15.5%) shapes.[16]

In contrast, Anil Sharma and colleagues surveyed one hundred and eighty edentulous patients and identified that the triangular shaped pads were the second most common (34.30%) after pear-shaped pads (51.30%), with rounded pads being the least common (14.30%).[1]

They concluded that the pear and triangular shaped retromolar pad have an increased surface area as compared to the round shaped. Another research however concluded that area covered by the retromolar pad has little influence on force distribution during loading.[17]

According to Cha, there were no significant differences in retromolar pad shapes between the left and right sides, nor were any parameters observed to vary with age.[7] Pear shape was found to be the most prevalent, accounting for 56.5%, followed by oval or round shape 27.7%, and triangular shape 15.8%.

Based on the findings of the current study, it is evident that there are diversities in the size and shape of the retromolar pad across different populations, which impacts denture stability. A larger surface area and diameter of the retromolar pad contribute to better denture stability, as forces are more evenly distributed over an extended area. Therefore, thorough assessment of the retromolar pad is essential during the fabrication of complete dentures, and incorporating enhanced design features can improve marginal seal and overall stability of the prosthesis.

Significance: The retromolar pad serves as a consistent, stable and accessible anatomical landmark, which aligns with the mandibular posterior occlusal plane.[12] Its size and shape influence denture retention, with age-related resorption, gender differences, and genetic factors influencing its surface area. Additionally, its diameter defines the posterior extension of mandibular dentures, contributing to marginal seal and stability. These findings highlight its clinical relevance in prosthetic dentistry.

Limitations: The current study has a few shortcomings. There was a limited sample size that may not reflect the broader population, reducing the generalizability of the results. It lacks long-term follow-up to assess the impact of retromolar pad shape on denture stability over time. With increasing age, the retromolar pad tends to undergo resorption or changes in the soft tissue, reducing the effective surface area. Older patients often have a less pronounced retromolar pad, leading to challenges in denture retention. Since this research does not explore the full range of factors, such as gender, genetic predisposition, systemic conditions, tooth loss consequence, duration of edentulous time, soft tissue health, previous denture wearing experience, and many other unidentified contributors which may influence the ongoing remodelling process of the edentulous jaws. These limitations highlight the need for more comprehensive studies to better link anatomical variations with clinical outcomes.

CONCLUSION

The current study found significant variations in the shapes of the retromolar pad in completely edentulous patients. These findings underscore the importance of accounting for the anatomical features of the retromolar pad when making clinical decisions and planning prosthetic treatments. Understanding these variations can contribute to more effective prosthetic planning, ultimately improving the success of dental prostheses in edentulous patients within this specific population.

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Author's Contribution:

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

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Original Article

Incidence of Cervical Cancer in Iraq

Cervical Cancer in Iraqi Women

Zahraa Adnan Ghadhban Al-Ghuraibawi[1], Istikrar Muslem Hade[1] and Maryam Majid Al-Khaiat[2]

ABSTRACT

Objective: To examined the common frequency of cervical cancer in Iraqi women.
Study Design: Descriptive study
Place and Duration of Study: This study was conducted at the Iraqi Cancer Agency and the Cancer Registry data from the Iraqi Ministry of Health provided assistance in data gathering from 1st April 2020 to 31st December 2021.
Methods: The study examined 504 women diagnosed with cervical cancer. Their ages ranged from 20 to over 80 years. The data analysis employed descriptive statistics to determine the frequency, proportion, and incidence of cervical cancer.
Results: The cervical cancer was predominantly caused by human papillomavirus in women in 2020 (1.29%) and 2021 (2.1%). In 2020, the number of cases of cervical cancer in Iraqi women was predominantly concentrated in the age groups 50-54 years [33 (13.693%)] and 55-59 years [33 (13.693%)] while in 2021, the majority of the cases were concentrated in the age group 50-54 years [47 (17.87%)]. Many women who have cervical cancer in Iraq in 2020 and 2021 are from households who have a poor socioeconomic position (71.78%) and (70.72%), respectively.
Conclusion: The number of Iraqi women who have cancer of the cervix is growing in 2021. The women between the ages of 50-54 and 55-59, as well as those with lower socioeconomic position, are at higher risk of getting cervical cancer.
Key Words: Incidence, Cervical Cancer, Iraq

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INTRODUCTION

Cervical cancer is responsible for nearly 7% of the deaths of women globally. Many occurrences (85%) occur in underdeveloped nations that have insufficient preventative measures in place.[1]

Cervical cancer is the second most frequent kind of cancer on the world. Behind breast and lung cancer, it is the third most common form of cancer in women after these two diseases. Around 90% of the fatalities connected with cervical cancer occur in poor nations.[2]

The most typical dangers include early sexual debut, many sexual partners, and a reduced immune system. Human papillomavirus (HPV) is the principal causal factor in the majority of instances and causes 99.7% of the cases of cervical cancer. Cervical cancer is one of the most prevalent kinds of cancer in women.[3,4]

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Several factors increase the woman's probability of having cervical cancer, including viral infections (such as the HPV, HIV, and HSV), multiple pregnancies, early sexual activity, multiple partners, smoking, low socioeconomic status, a diet low in antioxidants, poor hygienic practices, long term use of oral contraceptives, and diseases that detriment the immune system.[5]

Every year, roughly 244 new instances of cervical cancer are discovered in Iraq, this makes it the 13th most prevalent form of cancer among women. Around 159 women are died by cervical cancer every year, thus making it the 12th largest cause of cancer death in women.[6]

In Iraq, roughly 13.8 million women between the ages of 15 and 64 are vulnerable to the development of cervical cancer. Every year, roughly 286 women are diagnosed with cervical cancer, and 193 are died by the illness. This malignancy is the 15th most prevalent kind of cancer in Iraqi women, and the 12th most common type in women between the ages of 15 years and 44 years.[7]

The prevalence of HPV in the Iraqi population is scarce. However, in West Asia, including Iraq, it is expected that 2.5% of women in the general population are infected with HPV 16/18 at any given time, and 72.4% of the invasive malignancies of the cervix are caused by reoccurring HPV 16 or 18.[8]

The increased death rate worldwide due to cervical cancer can be minimised by pursuing a complete strategy that includes prevention, early detection, and

effective screening and treatment programs. Vaccines can prevent the common kind of HPV that causes cancer, and they can greatly lessen the probability of cervical cancer.[6]

Similar to other nations in the Islamic religion, Iraq has a low prevalence of cervical cancer, although the majority of cases are advanced and have a poor chance of recovery. The incidence of CIN lesions in patients with gynecological problems in Iraq is not negligible. The frequency is 1.20/100,000 P.[7]

Because of its protracted phase of pre-invasion, cervical cancer is a disease that can be avoided. Early detection and successful therapy are both attainable with extensive monitoring.[8]

The screening of cytology for pre-cancerous alterations and the treatment of these abnormalities, is useful in decreasing the incidence of cervical cancer and reducing its mortality. The Pap smear is a simple, inexpensive, and non-invasive test that is part of the usual gynecological check-up in primary care that identifies abnormalities that might lead to cervical cancer. Combined with a regular screenings program and adequate follow-up, the Pap test can lower the death risk of cervical cancer by up to 80%.[9,10]

The purpose of this research was to calculate the frequency of cervical cancer in Iraqi women throughout the timeframe of 2020 and 2021 based on existing documented information.

METHODS

This descriptive study was acquired from the Iraqi Cancer Registry and the Iraqi Ministry of Health's records and administrative systems from from 1st April 2020 to 31st December 2021 vide letter No.135 dated 11-3-2020. The total number of registered women with cervical cancer in 2020 was 241 and in 2021 were 263. As a consequence, the total number of participants recruited for the study was 504 women that were diagnosed with cervical cancer. Their ages varied from 20 to over 80 years. The data was entered and analyzed through SPSS-25.

RESULTS

The highest incidence rate of HPV-related cancers among women is accounted for cervical cancer for the year of 2020 (1.29%) and the year of 2021 (2.1%) [Table 1]. There is unfortunately no evidence on the existence of official national cervical screening practices and recommendations (Table 2). Majority of the instances of cervical cancer in Iraqi women in 2021 were in the 50-54 year range [47 cases (17.87%)] (Table 3). Most of women with cervical cancer is belong to families of low socioeconomic status for the year of 2020 (71.78%) and the year of 2021(70.72%) [Table 4].

Table No.1: Crude incidence rates of cervical cancer

Type of cancer	2020	2021
Cervical cancer	1.29%	2.1%

Table No.2: Practice and recommendations for cervical cancer screening

Existence of Official National Recommendations	2020	2021
The recommended start year	NO	NO
Active invitation screening	NO	NO
Age at screening (years), primary screening test used, and screening interval or frequency	NO	NO

NO = No evidence

Table No.3: Distribution of women with cervical cancer by age

Age (years)	2020	2021
20-24	1 (0.42%)	2 (0.76%)
25-29	4 (1.66%)	2 (0.76%)
30-34	7 (2.90%)	8 (3.04%)
35-39	24 (9.96%)	22 (8.36%)
40-44	27 (11.20%)	22 (8.36%)
45-49	27 (11.20%)	36 (13.69%)
50-54	33 (13.69%)	47 (17.87%)
55-59	33 (13.69%)	38 (14.45%)
60-64	27 (11.20%)	30 (11.41%)
65-69	15 (6,22%)	29 (11.03%)
≥ 80	14 (5.81%)	27 (10.27%)
Total	241 (100%)	263 (100%)

Table No.4: Socioeconomic status

Year	Socioeconomic status		
	Low (7-10)	Moderate (11-25)	High (26-29)
2020	173 (71.78%)	38 (15.77%)	30 (12.45%)
2021	186 (70.72%)	45 (17.11%)	32 (12.17%)

DISCUSSION

The cervical cancer incidence rate in Iraqi women was 1.29% in 2020, this climbed to 2.1% in 2021 in the present study. There are various explanations of this rise, including a lack of knowledge of how to avoid cervical cancer and a lack of comprehension of the screening recommendations and practices of cervical cancer.

The increase in occurrences of cervical cancer in Iraq in 2021, the country's incidence rate is still lower than the global average given by the World Cancer Research Fund International.[13] The cervical cancer continues to be a serious concern for women globally, thus underscores the requirement of more effective preventive and treatment strategies.[14]

This study showed that cervical cancer predominantly affects women in the 50-54 and 55-59 age ranges. The women in these age groups may have an increased likelihood of getting cervical cancer. Cervical cancer is most typically diagnosed in women between the ages of 35 and 44, with an average age of diagnosis of 50 years. This condition is rare in young women under the age of 20. Many older ladies don't understand that their likelihood of developing cervical cancer increases with age. Above 20% of the incidences of cervical cancer occur in women who are above the age of 65. However, these malignancies are infrequent in women who participate in routine cervical cancer prevention before the age of 65.[15] The National Cancer Institute has reported that the age distribution of women who are diagnosed with cervical cancer is as follows: less than 0.1% are under 20 years old, 13.7% are between 20 and 34 years old, 22.8% are between 35 and 44 years old, 22.4% are between 45 and 54 years old, 19.7% are between 55 and 64 years old, 12.2% are between 65 and 74 years old, 6.4% are between 75 and 84 years old, and 2.6% are over 85 years old. These figures suggest that women between the ages of 35 and 44 have a greater likelihood of having cervical cancer.[16]

Majority of women who are diagnosed with cervical cancer have socioeconomic situations that are lower than usual. This study confirms the idea that women from disadvantaged families have a higher risk of getting cervical cancer than other women because of their lesser understanding of preventative strategies and restricted access to healthcare. The risk of cervical cancer is higher in nations with low wealth. This indicates the large inequalities caused by the lack of national coverage of HPV vaccinations, cervical cancer prevention and treatment, as well as social and economic concerns.[17]

The evidence demonstrates that a poor socioeconomic position is connected to greater levels of cervical cancer incidence and death. The most significant indicators in socioeconomic relevance connected with cervical cancer are income and education. Those with less education have worse health literacy, which leads in their not identifying the risk or protective factors connected with cervical cancer. Inadequate financial resources may hamper women's capacity to obtain healthcare services, particularly in respect to cervical cancer screening and proper treatment.[18]

CONCLUSION

Cervical cancer is also present in adult women. The number of cases of cervical cancer in Iraqi women is increasing in 2021. The women with a lower socioeconomic position have a greater likelihood of getting cervical cancer.

Recommendations

1. Screening is essential so that women can check for changes in cervical cancer regularly and always have a check-up by a doctor.
2. Educational initiatives intended for women can be created, implemented, and modified to increase their understanding of how to prevent cervical cancer.
3. National studies with multiple characteristics can be conducted.

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Final Approval of version:	All the above authors
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Original Article

Assessment of the Anticoagulant Effect of Curcumin as Adjuvant Therapy to Enoxaparinin Covid-19 Iraqi Patients

Maiss S. Baqer[1], Saifan A Dushan[1], Rafif Raad[1], Rabab Mohammed Noori Hameed[1], Ayaashraf Ahmed[1] and Basim Dhawi Dakhil[2]

ABSTRACT

Objective: To assess the anticoagulant effect of curcumin as adjuvant treatment to enoxaparin in COVID-19 patients.

Study Design: Randomized open-labelled controlled trial study.

Place and Duration of Study: This study was conducted at the College of Pharmacy, Al-Esraa University, Baghdad, Iraq from 1st February 2020 to 31st July 2020.

Methods: Fifty-eight patients with confirmed Covid19 were enrolled into 2 groups: Group A; 29 patients were given Enoxaparin prophylactic dose 4000 IU twice daily every 12 hrs**.** Group B; 29 patients were given Enoxaparin prophylactic dose 4000 IU twice daily every 12 hrs + Curcumin 500 mg 3 times daily.

Results: A significantly higher level of improvement in the outcomes of D-dimer serum level in the group treated with enoxaparin and curcumin in comparison with group A which was treated with enoxaparin alone ($P<0.05$).

Conclusion: The overall results of this clinical study showed a significant D-dimer reduction by curcumin supplementation as well as reducing mortality and enhancing the overall clinical outcome of the treatment when used as an adjunct to enoxaparin.

Key Words: Curcumin, D-dimer, Enoxaparin, COVID-19, Anticoagulant effect

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INTRODUCTION

Coronavirus disease-19 (COVID-19), a severe respiratory illness caused by SARS-associated coronavirus-2 (SARS-CoV-2). The "(SARS-CoV-2)" is a single-stranded RNA coronavirus that enters the human cell mainly by binding to angiotensin-converting enzyme 2 (ACE 2)[1,2], which in general ranges from asymptomatic or mild symptoms including fever, headache, cough, fatigue, dyspnea, diarrhea, and myalgia to even fatal cases.[3,4]

Even though the respiratory compromise is the main feature of the disease that elevated circulating D-dimer levels which is a by product of the degradation of fibrin found in blood after blood clot fibrinolysis plays a mechanistic role in thrombo-inflammation in Covid 19 which's also associated with mortality, suggesting a distinct coagulation disorder related to COVID-19.[5,6]

Curcumin is a polyphenol derived from the Curcuma long a plant and has been used extensively in complementary and alternative medicine, as it is non-toxic and safe with various therapeutic properties. Modern scientific research has demonstrated its anti-inflammatory, antioxidant, anti-carcinogenic, antithrombotic and cardiovascular protective effects.[7,8]

METHODS

A randomized open-labelled controlled trial was carried out to assess the effect of adding curcumin to enoxaparin in patients with COVID-19. A total of 58 patients aged (19-75) with confirmed Covid were enrolled in this study. All patients are eligible to studyif they were fulfilling the criteria of diagnosis COVID-19 and had a PCR test positive as well as symptomatic and radiologic evidence of mild to moderate COVID-19. Study follow-up was for about 5 to 10 days. Eligible patients were randomly allocated into two groups as follows: Group A; 29 patients given Enoxaparin prophylactic dose 4000 IU twice daily every 12 hrs Group B; 29 patients given Enoxaparin prophylactic dose 4000 IU twice daily every 12 hrs + Curcumin 500 mg 3 times daily Patients were recommended to take Enoxaparin injection SC twice daily while curcumin 500mg cap three times daily after meal clinical

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outcomes were evaluated by measuring D-dimer serum levels. The data was entered and analyzed through SPSS-25.

RESULTS

The non-significant statistical differences between both groups concerning gender and age (P>0.05) [Fig. 1]. The change in serum D-dimer level was statistically non-significant between groups neither at baseline nor after treatment. However, a significantly higher level of improvement in the outcomes of D-dimer serum level was seen in group B compared to that in group A after treatment (P<0.05). A non-significant change in D-dimer serum levels was demonstrated after treatment with enoxaparin alone compared to baseline levels, as a matter of fact, there was a slight increase in D-dimer serum level after treatment with enoxaparin alone (P>0.05) (Table 1).

Table No.1: Comparison of D-dimer in pre- and post-treatment in both groups

D-dimer	**Group A (Enoxaparin)**	**Group B (Enoxaparin + curcumin)**	**P-value**
Pre-treatment	1.6783	2.8341	0.574
Post-treatment	1.8248	1.3369	0.257

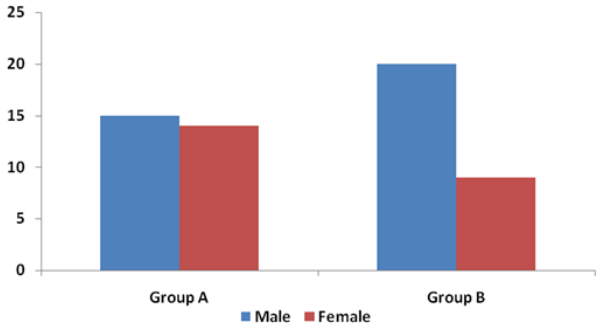

Figure No. 1: Comparison of genders in both groups

DISCUSSION

Coronavirus disease 2019 (COVID-19) is associated with extreme inflammatory response, disordered hemostasis, and high thrombotic risk. D-dimer is a fibrin breakdown product that has a mechanistic role in COVID-19 thrombo-inflammation. As a result, it might be considered a global marker of hemostasis activation in COVID-19.[9,10] Recent autopsy studies supported this hypothesis of COVID-19 patients the fibrin thrombi observed in enlarged capillaries and small blood vessels, as well as widespread extracellular fibrindeposition.[11,12] The hypercoagulable condition and secondary hyperfibrinolysis in vivo that result in coagulopathies during COVID-19 infection can be explained by two different hypotheses. One is the increased levels of pro-inflammatory cytokines (IL-6, IL-1, and TNF-), which damage the lungs' microvasculature and cause endothelial dysfunction, hemostasis disturbances, and pulmonary thrombi. The second alternate theory is that systemic thrombosis is caused by the virus's direct or indirect impact on coagulation pathways.[13,14]

A recent meta-analysis found a link between COVID-19 severity and many inflammatory biomarkers (such as C-reactive protein (CRP), procalcitonin, interleukin (IL-6) and ferritin).[11]

In the present study patients with Covid 19 have high levels of D-dimer and most studies have demonstrated that COVID-19 patients had considerably higher levels of D-Dimer, C-reactive protein (CRP), and fibrinogen. D-dimer can predict the likelihood of deep vein thrombosis and patient death and be strongly correlated with the severity of the condition. As the severity of the disease progressed, the coagulation indicators increased significantly in COVID-19 patients. Thus by monitoring changes in laboratory markers and timely adjusting the anticoagulant dose, the clinical administration of COVID-19 patients provides a justifiable basis for administering anticoagulation therapy.[15-18]

To our knowledge, no study, to date, has addressed the effect of curcumin on the D-dimer and thrombotic sequelae in patients with Covid-19. Thus, because of the potential effect of curcumin on inflammation and its capacity to act as an anti-viral as well as its previously reported effect on cardiovascular and lung health, as one early study reported that treatment with Curcumin resulted in early symptomatic recovery (fever, cough, sore throat, and breathlessness), less deterioration, fewer red flag signs, better clinical results for patients and the capability to sustain oxygen saturation above 94% on room air in patients with mild, moderate, and severe symptoms.[8,19,20] we chose to explore its effect on cases of Covid-19 with a mild to moderate rise in d-Dimer serum level

Our results showed that using curcumin as an adjunct to enoxaparin exhibits a better overall outcome than using enoxaparinby itself with the added benefit of high safety profile these findings reinforce the finding of other studies that investigated the antithrombotic properties of curcumin and how it reduces thrombosis in mice by adjusting platelet counts, D-dimer, and plasminogen activator inhibitor-1, as well as the anticoagulant qualities of curcumin and its derivative (bisdemethoxy curcumin, BDMC), which were assessed by tracking the activities of cell-based thrombin and activated factor X (FXa) generation, prothrombin time (PT), and activated partial thromboplastin time (aPTT). The results demonstrated that curcumin and BDMC significantly prolonged aPTT and PT and inhibited thrombin and FXaactivities.[21-23]

CONCLUSION

The overall results of this clinical study showed a significant D-dimer reduction by curcumin supplementation. These findings uphold the idea that this polyphenol has the potential in attenuating coagulopathy and mitigate disease severity Moreover, clinical trials with curcumin demonstrated safety, durability, and nontoxicity. Thus, it sounds rational to consider the treatment of COVID-19 and its complications with highly effective nutraceuticals such as curcumin even alone or as an adjunct to other best-known treatments of it.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Maiss S. Baqer, Saifan A Dushan, Rafif Raad
Drafting or Revising Critically:	Rabab Mohammed Noori Hameed, Ayaashraf Ahmed, Basim Dhawi Dakhil
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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

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Original Article

Assessment of β-Catenin Levels and Related Biomarkers in Patients with Chronic Kidney Disease

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ABSTRACT

Objective: To contrast the alterations in serum concentrations of insulin-like growth factor-1 (IGF-1), β-catenin, calcium, vitamin D, parathyroid hormone (PTH), and phosphorus in renal failure patients with those in normal controls, and to contrast between-group differences to further define the biochemical derangements in renal failure.
Study Design: Comparative study
Place and Duration of Study: This study was conducted at the Iraqi hospitals and kidney disease centers from 7th August 2022 to 1st April 2023.
Methods: The study included 400 samples, control 100 and patients 300. Three groups were formed; each group was made up of 100 patients. These groups varied in age. Patients with cancer, and pregnant women were not included.
Results: Insulin-like growth factor-1, β-catenin, calcium and vitamin D, levels and increase in parameters parathyroid hormone and phosphorus varied significantly amongst the groups, according to the data. The first group, followed by the second and third groups, showed the lowest levels, while all three groups showed lower levels than the control group.
Conclusion: The reduction in the levels of IGF-1, β-catenin, calcium and vitamin D and increase in parameters parathyroid hormone and phosphorus.
Key Words: Chronic kidney disease, Insulin-like growth factor-1, β-catenin, vitamin D
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INTRODUCTION

Kidney failure, a life-threatening condition characterized by the loss of kidney function, is an enormous cost to healthcare systems globally. The kidneys, vital organs that filter waste, balance electrolytes, and regulate blood pressure, can be permanently damaged by chronic kidney disease (CKD) or acute kidney injury (AKI). CKD, a chronic decline in renal function, affects over 850 million people worldwide, with diabetes mellitus and hypertension accounting for nearly two-thirds of the burden. AKI, which is an acute renal failure, affects 13.3 million patients yearly, with sepsis, dehydration, or nephrotoxic medications frequently initiating it. Both conditions enhance morbidity and mortality, particularly in the aging population and in low-resources.[1,2]

The pathophysiology of renal failure is complex, with interaction between genetic, environmental, and lifestyle determinants. For instance, diabetic nephropathy, a leading cause of CKD, is due to chronic hyperglycemia-induced renal vasculature damage. Similarly, hypertension accelerates glomerulosclerosis, diminishing filtration potential. Emerging risk factors include obesity, smoking, and genetic predispositions, e.g, APOL1 gene variants in African ancestry populations. Socioeconomic disparities also exacerbate outcomes; marginalized communities have delayed diagnoses due to limited access to healthcare.[3]

If left untreated, kidney failure progresses to end-stage renal disease (ESRD) and necessitates dialysis or transplantation. Furthermore, CKD enhances cardiovascular risk, and cardiovascular mortality is 10–20-fold more probable in dialysis patients.[4]

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METHODS

The study was conducted in some Iraqi hospitals and kidney disease centers, during the period from 7th August 2022 to 1st April 2023. The study included 400 sample, control 100 and patients 300. Three groups were formed; each group was made up of 100 patients: There were (400) sample, control and patients with euthyroid goiter aged 25-70 years were considered as a sample of this study. They were categorized into four groups as group A (patients, CKD) includes100 patients aged 55 to 70 years, group B (patients, CKD) includes 100 patients aged 40 to 55 years, group C (patients, CKD) includes 100 patients aged 25 to 40 years and group D (control) consisted of 100 healthy subjects aged 25-70 years. Blood of patients was analyzed through medical tests, i.e, (IGF-1, β-catenin, calcium, vitamin D, PTH and phosphorus using the ELISA device. The data was entered and analyzed through SPSS-25.

RESULTS

The outcomes were reflected in Table 2, indicated the decline in insulin-like growth factor, β-catenin, and calcium, vitamin D and increase in parameters PTH, and phosphorus characteristics of the microorganisms of interest. Specifically, the outcome indicated a discernible decline in the three groups of patients as compared to the control group Kidney failure. In addition, the outcomes of the three groups varied from one another, and the variation is clearly depicted in Tables 1-2 and Figures 1-6.

Table No.1: Descriptive statistics of studied groups

Group	Mean±SD
A	61.96±6.00
B	48.13±6.42
C	36.23±6.3
D	47.06±5.6

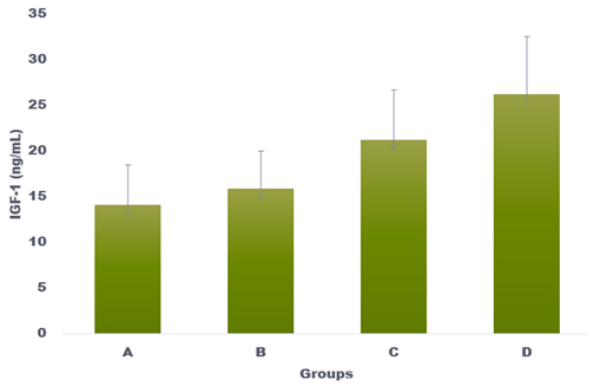

Figure No. 1: IGF-1 serum level of the patient groups and control group

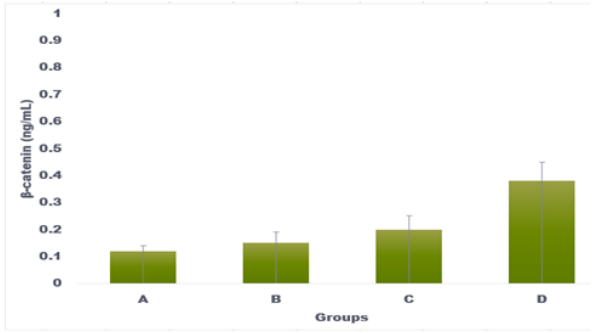

Figure No. 2: β-catenin serum level of the patient groups and control group

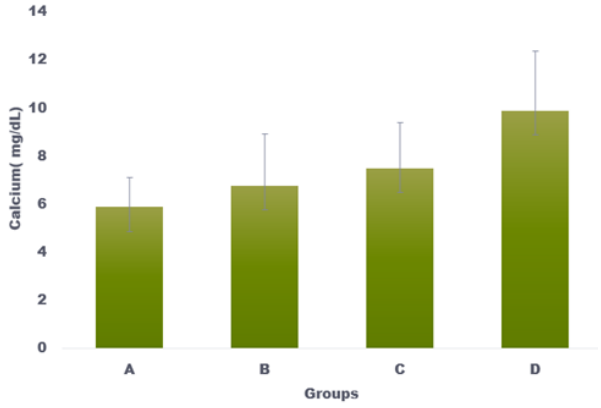

Figure No. 3: Calcium serum level of the three patient groups and control group

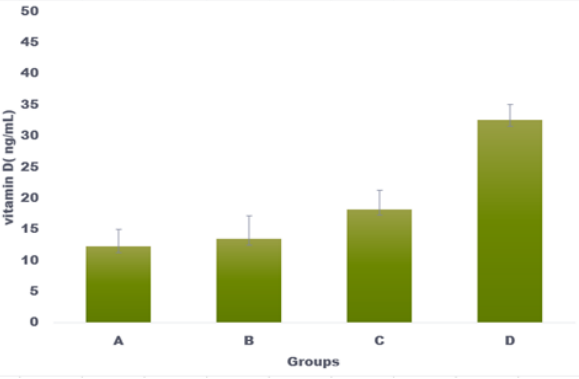

Figure No. 4: Vitamin D serum level of the three patient groups and control group

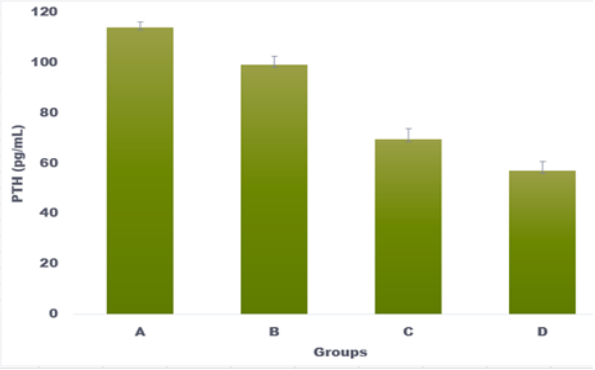

Figure No. 5 Vitamin D serum level of the three patient groups and control group

Table No.2: IGF-1, β-catenin, calcium, vitamin D, PTH and Phosphorus tests for studied groups

Group	IGF-1 (ng/mL)	β-catenin (ng/mL)	Calcium (mg/dL)	vitamin D (ng/mL)	PTH (pg/mL)	Phosphorus (mmol/L)
Group A	14.10±4.32^{b}	0.16±0.03^{b}	5.87±1.24^{c}	12.24±2.69^{c}	113.73±2.36^{c}	11.2±0.97^{d}
Group B	15.82±4.17^{b}	0.19±0.05^{b}	6.75±2.17^{b}	13.45±3.74^{c}	98.91±3.45^{bc}	9.88±1.03^{c}
Group C	21.21±5.42^{b}	0.22±0.06^{b}	7.49±1.90^{b}	18.22±2.99^{b}	69.35± 4.40^{b}	7.6±1.06^{b}
Group D	26.21±6.28^{a}	0.35±0.08^{a}	9.88±2.48^{a}	32.51±2.54^{a}	56.83±3.88^{a}	4.14±1.07^{a}
L.S.D	8.9	0.11	0.75	2.11	7.79	0.61

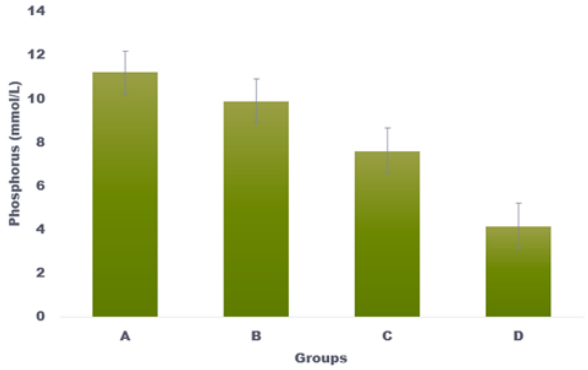

Figure No. 6: Phosphorus serum level of the three patient groups and control group

DISCUSSION

The IGF axis contains IGF-I, IGF-II, their receptor, and a family of IGF binding proteins (IGFBPs). It is essential for cell proliferation, tissue repair, and metabolism. In kidney disease (CKD) and renal failure, the following most important changes have been observed in this system. Renal failure patients have reduced circulating IGF-I in the body. This is because circulating IGF-I levels are reduced primarily as a result of an increase in the binding concentration of IGFBPs with IGF-I to limit bioavailability. These high levels of IGFBPs not only sequester IGF-I but also induce a condition of resistance of growth hormone and hence undermine any normal anabolic actions mediated through IGF-I.[5,6]

Muscle wasting, diminished physical capacity, and unfavorable nutritional status have been described due to decreased activity of IGF-I in CKD. These all contribute to the overall morbidity caused by chronic kidney failure in patients and have much more direct consequences on their health state. IGF-I is involved in renal development as well as repair, and in addition to systemic action, it has organ-specific action. In progressive renal failure, the deficiency of proper IGF-I action may impair the kidney's capacity to regenerate and recover from injury, further extending progression in renal dysfunction.[7,8]

Kidney failure is also associated with profound disruption of the IGF axis, specifically decreased levels and activity of IGF-I, which may be responsible for both systemic manifestations such as muscle wasting and additional renal function impairment. These observations make targeting the IGF system a potential therapeutic intervention in CKD, but further studies are required to elucidate the precise mechanisms and develop safe and effective interventions.[9,10]

The Wnt/β-catenin pathway is a key regulator of embryonic development and adult tissue homeostasis. In renal failure, particularly in chronic kidney disease (CKD), dysregulation of this pathway has been implicated in the formation of renal fibrosis, podocyte injury, and the deterioration of kidney function. Wnt/β-catenin signaling in the normal adult kidney is relatively quiescent; however, in response to injury such as ischemia-reperfusion injury or toxin-induced injury, the pathway reactivates. Transient activation of β-catenin is apparently beneficial in acute injury by initiating repair mechanisms, but chronic or uncontrolled activation is deleterious. Chronic activation causes transcription of profibrotic genes (such as fibronectin, matrix metalloproteinase-7, and plasminogen activator inhibitor-1) and induces epithelial-to-mesenchymal transition (EMT), which collectively results in interstitial fibrosis.[11,12]

The relationship between β-catenin and kidney failure is a twofold one: while transient activation may be involved in repair, chronic β-catenin activity promotes fibrotic alterations leading to progressive kidney failure. Thus, therapeutic strategies targeting the selective modulation of β-catenin signalling may be capable of reducing fibrosis and improving renal function in CKD patients.[13,14]

Chronic kidney disease is also closely related to mineral and bone metabolism abnormalities and thus a disorder referred to as CKD-mineral and bone disorder (CKD–MBD). One of the central aspects of CKD–MBD is secondary hyperparathyroidism (SHPT), where the parathyroid glands release PTH at a raised level chronically in response to an abnormal calcium, phosphate, and vitamin D metabolism. In CKD, decreased renal clearance of phosphate, decreased conversion of vitamin D to its biologically active form, and consequent hypocalcemia cause a compensatory rise in secretion of PTH. With time, this chronic stimulation leads to hyperplasia of the parathyroid glands and autonomous secretion of PTH, thereby aggravating metabolic derangements.[15,16]

Hyper PTH in CKD not only induces high-turnover bone disease (osteitisfibrosa) but also extra skeletal complications. Therefore, for instance, elevated PTH chronically can induce adipose tissue browning and enhanced energy expenditure resulting in wasting - a process which has been linked to poor clinical outcomes in patients on dialysis. Furthermore, PTH-induced bone resorption releases calcium and phosphate from the skeleton, resulting in vascular calcification and increasing the risk of cardiovascular events and mortality.[17,18]

The drug-induced effect has been shown to reduce PTH alongside serum calcium and phosphate concentrations and could potentially improve cardiovascular outcomes. At the same time, parathyroidectomy is a definitive treatment for advanced SHPT, and observational studies have linked its application with improved survival in dialysis patients. Overall, the CKD-PTH interaction is multifaceted, as CKD-stimulated abnormalities in mineral metabolism cause SHPT, whose contribution is to skeletal and cardiovascular morbidity. Treatment of elevated PTH by medical or surgical intervention is crucial in regulating the adverse outcomes secondary to CKD–MBD.[19,20]

CONCLUSION

The decline in insulin-like growth factor, β-catenin, and calcium, vitamin D and increase in parameters PTH, and phosphorus with increasing age. The oldest cohort exhibited the most pronounced reductions, followed by the middle-aged group, and finally the youngest group, which showed a slight decrease, but parathyroid hormone and inorganic phosphorus showed the exact opposite suggesting that these parameters could serve as biomarkers for diagnosing CDK.

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Original Article

A Study of Estimation of Stature by Anthropometric Measurements of the Head

Lubna Riaz[1], Ashhad Mazhar Siddiqui[2], Muhammad Noman Rashid[4], Riaz Ahmed Shahid[3], Nasrul Huda[2] and Nazia Shahab[2]

ABSTRACT

Objective: The purpose of this study was to examine the estimation of height using head circumference and to develop a linear regression formula.
Study Design: Cross-sectional study
Place and Duration of Study: This study was conducted at the Dow University of Health Sciences, Civil Hospital, Karachi from 01.01.2024 till 01.06.2024.
Methods: Through non-probability consecutive sampling, 50 participants, aged 18 years and above, both genders were recruited. Anthropometric measurements of the head (Head circumference) were obtained.
Results: For males, the equation was S = -0.15083HC + 187.48522, where 'S' represents stature and 'HC' represents head circumference. Conversely, for females, the equation was S = 0.48272HC + 132.69883.
Conclusion: Our findings suggest that, for both sexes, head circumference is a fairly accurate measure of height.
Key Words: Stature, Anthropometric, Head, Head Circumference

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INTRODUCTION

Stature, also known as standing height, refers to the vertical distance between the highest point of the head (vertex) and the surface on which a person is standing[1]. Stature prediction plays a crucial role in anthropological study and forensic identification analysis after accidents, crimes, genocide, or natural catastrophes, since it offers valuable information for individual identification[2]. Given the limited availability of some body parts and bones for forensic testing, it becomes imperative to utilise alternative regions of the body, such as the head and face[3]. However, few research investigations have been undertaken specifically on the cephalo-facial area in relation to the height assessment. Forensic anthropologists assist in the analysis of evidence related to the cause or method of death when identifying human remains[4]. Indentations on skeletal remains provide crucial insights into the cause of death[5]. Given the presence of skeletal trauma, it is crucial to identify and differentiate between ante mortem accurately (before death), perimortem (around the time of death), and postmortem (after death) injuries[6]. Several researches have been conducted on the estimate of height solely based on the skull. It has been demonstrated that each race requires a unique method for estimating stature. Different geographical locations exhibit racial and ethnic disparities within their populations[7]. Incisions on the skeletal structure provide crucial insights into the cause of death. The purpose of this study was to examine the estimation of height using head circumference and to develop a linear regression formula. Additionally, the study aimed to demonstrate that head circumference is a dependable indicator for estimating stature.

METHODS

After ethical approval from the institution review board, this cross-sectional study was conducted at Dow University of Health Sciences, Civil Hospital, Karachi, from 01/01/2024 till 01/06/24. Through non-probability consecutive sampling, 50 participants, aged 18 years and above, both genders were recruited. Anthropometric measurements of the head (Head circumference) were obtained using standardized techniques and instruments, including callipers and anthropometers. Stature was measured using a stadiometer or anthropometer. Data on demographic

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variables, such as age and sex were also recorded. SPSS version 21 was utilized to perform linear regression.

RESULTS

The mean head circumference for males was found to be 55.65±1.29cm, while for females, it was slightly lower at 55.25 ±2.1cm. In terms of height or stature, males had an average of 179.09±2.59, significantly taller than females who averaged 159.3 ±3.04cm. Two regression equations were derived from the data to predict stature based on head circumference, with constants 'a' and 'b' determining the relationship. For males, the equation was S = -0.15083HC + 187.48522, where 'S' represents stature and 'HC' represents head circumference. Conversely, for females, the equation was S = 0.48272HC + 132.69883. These equations provide predictive models for estimating stature based on head circumference, with different slopes and intercepts for males and females, reflecting the sexual dimorphism in these anthropometric measures.

Table No.1: Variables

Variables	Males (n=25)	Female (n=25)
Head Circumference (HC) (cm)	55.65±1.29	55.25±2.1
Height/Stature(s) (cm)	179.09±2.59	159.3±3.04
Constant a	187.48	132.69
Constant b	-0.15	0.48
Equation	S = -0.15083HC + 187.48522	S = 0.48272HC + 132.69883
Correlation coefficient (r)	0.075	0.344

Equation calculation summary
Sum of X = 1391.39
Sum of Y = 4477.27
Mean X = 55.6556
Mean Y = 179.0908
Sum of squares (SS_X) = 40.2068
Sum of products (SP) = -6.0643

Regression Equation = $\hat{y} = bX + a$
$b = SP/SS_X$ = -6.06/40.21 = -0.15083
$a = M_Y - bM_X$ = 179.09 - (-0.15*55.66) = 187.48522
$\hat{y}$ = -0.15083X + 187.48522 (for Males)

Sum of X = 1381.39
Sum of Y = 3984.29
Mean X = 55.2556
Mean Y = 159.3716
Sum of squares (SSX) = 112.8988
Sum of products (SP) = 54.4981

Regression Equation = $\hat{y}$ = bX + a
b = SP/SSX = 54.5/112.9 = 0.48272
a = MY - bMX = 159.37 - (0.48*55.26) = 132.69883
$\hat{y}$ = 0.48272X + 132.69883

DISCUSSION

There are several approaches to estimating stature. In the present study, we observed a non-significant positive correlation of head circumference in determining the stature in both males and females (0.075 vs. 0.334). Our results are consistent with a study conducted by Preneth and Babu (2022), they observed a correlation value of 0.48 for men and 0.43 for females (8). The results were also consistent with those from earlier research, where the linear regression equation for men was Y = 2.81x + 137.39, r = 0.57, while for females it was Y = 0.49x = 155.39, r = 0.39, indicating little or no association.[9]
Another study indicated that total facial height (TFH) in men had a correlation value of 0.038, indicating little or no association. Contrarily, the correlation coefficient for nasal height (NH) in men was shown to be 0.034, indicating a weak or nonexistent association. Stature (cm)=156.86+3.01xNH in men, and stature (cm)=156.34+1.28xTFH in women, are the respective linear regression equations for total facial height and male height, respectively. The female total facial length (TFH) and nasal height (NH) correlation coefficients were 0.026 and 0.038, respectively, indicating little or no association. Alternatively, for females, stature (cm) = 144.96+1.12xTFH is the linear regression equation. Alternatively, for female NH, the linear regression equation is given by stature (cm) =142.71+3.11xNH[10]. There was a moderate degree of correlation between the two variables in another study: the right forearm length (RFL) and stature (cm) were determined to be (2.887xRFL+95.82) with a correlation coefficient of 0.500, and the left forearm length (LFL) and stature (cm) were determined to be (2.128xLFL+116.5) with a correlation coefficient of 0.615. In contrast, the North Karnataka population determined that the linear regression equation for RFL in females was height (cm) =2.427xRFL+99.46 and for LFL in females was stature (cm) =2.632xLFL+95.08[11]. When it came to estimating height from head circumference, the current study's sample size was too small. We hope to expand the sample size and include more age groups in future measurements.

CONCLUSION

Our findings suggest that, for both sexes, head circumference is a fairly accurate measure of height.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Lubna Riaz, Ashhad Mazhar Siddiqui, Muhammad Noman Rashid

Drafting or Revising Critically:	Riaz Ahmed Shahid, Nasrul Huda, Nazia Shahab
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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Original Article

Frequency of Common Risk Factors for Acute Exacerbation of Chronic Obstructive Pulmonary Disease, at a Tertiary Care Hospital

Acute Exacerbation of Chronic Obstructive Pulmonary Disease

Kaleemullah Kakar[1], Gulandam[1], Mohammed Atif Gulzar[1], Azizur Rahman[3], Abdul Ghaffar Khan[2] and Muzamil Majeed[1]

ABSTRACT

Objective: To determine the frequency of common risk factors for acute exacerbation of COPD at a tertiary care hospital.

Study Design: Descriptive cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Internal Medicine at Bolan Medical College, Quetta, from April 2024 till September 2024.

Methods: After obtaining informed written consent, patients were assessed for risk factors of acute exacerbation of COPD, such as asthma, smoking, ischemic heart disease, poor compliance, and seasonal variation, according to the operational definitions.

Results: A total of 139 patients with acute exacerbation of COPD were included in the study, with 116 males (83.5%) and 23 females (16.5%). The mean age was 51.115 ± 6.893 years. The following risk factors for acute exacerbation of COPD were noted: asthma in 50 patients (36%), smoking in 40 patients (28.8%), ischemic heart disease in 14 patients (10.1%), poor compliance in 26 patients (18.7%), and seasonal variation in 38 patients (27.3%).

Conclusion: Asthma, seasonal variation, and smoking were identified as the most common risk factors for acute exacerbation of COPD. These factors were more prevalent with increasing age, predominantly among the rural population and male patients.

Key Words: Risk factors, common, chronic obstructive pulmonary disease, exacerbation, frequency.

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a complex and heterogeneous disease[1]. It has been proposed that the identification of clinical phenotypes using validated biomarkers may promote the development of targeted treatment strategies directed towards specific biological pathways.[2] Chronic Obstructive Pulmonary Disease (COPD) is a chronic respiratory disease characterised by persistent respiratory symptoms and airflow limitation.

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COPD has a major impact on public health, mainly because of its increasing prevalence, morbidity and mortality. The natural course of COPD is aggravated by episodes of respiratory symptom worsening termed exacerbations that contribute to disease progression. Acute Exacerbations of COPD (AECOPD) can be triggered by a multitude of different factors, including respiratory tract infections, various exposures, prior exacerbations, non-adherence to treatment and associated comorbidities. AECOPD are associated with an inexorable decline of lung function and a significantly worse survival outcome.[3] The exacerbation of chronic obstructive pulmonary disease (COPD) seriously affects the patient's quality of life and prognosis.[4] The clinical manifestations and prevalence of COPD are variable, which may be related to differences in the level of economic development between provinces and the degree of exposure to risk factors.[5] The level of education, disease duration, and the presence of IHD were independent risk factors for AECOPD. Poor compliance due to the lack of understanding of the disease and the high cost of treatment is a risk factor for AECOPD.[4] The cost of hospitalization and drug therapy is higher among

patients with AECOPD, which leads to poor compliance so is one of the factor for AECOPS which also increases economic burden.[6] A retrospective study carried out in Taiwan showed that COPD patients having asthma had more exacerbations (35.3%) than patients with COPD alone (18.6%).[7] Smoking is widely recognised as the major risk factor for COPD development and progression. Smokers have a faster decline in lung function and a higher mortality rate than non-smokers.[8] In a Spanish study[9] the highest hospitalisation rate for AECOPD was in winter (37.6%), followed by autumn (24%), spring (23.7%) and summer (14.6%). Andrijevic et al reported that the most common CVDs associated with AECOPD were arterial hypertension (77.8%), systolic dysfunction (24.2%) and coronary artery disease (14.9%).[10] Several studies have shown incidence of common risk factors in acute exacerbation of COPD.[8,9] Although some single-center studies have been done in different parts of Pakistan, there is currently no published data on UGIB in Quetta. Moreover, there is still no robust national data on the subject. Hence, this study aimed at examining the frequency of common risk factors for acute exacerbation of chronic obstructive pulmonary disease at a tertiary care hospital in Quetta, thereby contributing to the pool of national data. The availability of such information may be useful in healthcare planning, especially for prevention of acute exacerbation of COPD.

METHODS

This descriptive cross-sectional study was conducted in the Department of Internal Medicine at Bolan Medical College, Quetta, from April 2024 till September 2024. All patients meeting the inclusion criteria and admitted to the Department of Internal Medicine, Bolan Medical College, Quetta, were included in the study. Non-probability consecutive sampling was used.

Sample Size:

The sample size was calculated based on the following parameters:

- Smoking prevalence in patients with AECOPD: 77%
- Confidence level: 95%
- Margin of error: 8%
- Sample size (n): 139 patients with acute exacerbation of COPD
  (Population proportion sample size calculator)

Inclusion Criteria:

- Patients aged 30 to 65 years.
- Either gender.
- Patients admitted with acute exacerbation of COPD, as per operational definition, for more than 6 hours.

Exclusion Criteria:

- Patients who did not provide informed consent.
- Patients with lung malignancy, assessed by history, clinical examination, and chest CT scan.

Data Collection:

The study was conducted after receiving approval from the College of Physicians and Surgeons Pakistan (CPSP). Patients admitted to the Internal Medicine Department at Bolan Medical College, Quetta, with acute exacerbation of COPD were enrolled based on the inclusion criteria. Informed consent was obtained from the patients or their families after explaining the risks and benefits of participation. A thorough history was collected regarding age, duration of symptoms, duration of COPD, and comorbid conditions (diabetes mellitus, hypertension).

Each patient was assessed for risk factors associated with acute exacerbation of COPD, such as asthma, smoking, ischemic heart disease, poor compliance, and seasonal variation. Data were recorded on a predesigned proforma, and exclusion criteria were followed strictly to avoid confounding variables.

Data Analysis:

Data were analyzed using SPSS version 22 (SPSS Inc., Chicago, IL, USA). Continuous variables, such as patient age, duration of COPD, and duration of symptoms, were reported as mean ± standard deviation or median (IQR). Categorical variables, including gender, place of residence (urban/rural), education level, and comorbidities (DM, hypertension), were presented as frequencies and percentages. Effect modifiers, such as age, gender, place of residence, education status, duration of COPD, duration of symptoms, and comorbidities (DM, hypertension, IHD, smoking), were analyzed using the Chi-square test or Fisher's exact test, with a p-value ≤ 0.05 considered statistically significant.

RESULTS

Data were collected from 139 patients. In our study 116 patients (83.5%) were males & 23 patients (16.5%) were females. The mean age was 51.115$\pm$6.893 years, the mean duration of COPD was 10.726$\pm$2.481 months & the mean duration of sign & symptoms of acute exacerbation of COPD was 26.280$\pm$12.885 hour.

Table No.1: Demographic data of patients

Variable	Frequency (n)	Percentage (%)
Gender		
Male	116	83.5
Female	23	16.5

Place of Residence		
Urban	36	25.9
Rural	103	74.1
Education Status		
Primary	48	34.5
Intermediate	42	30.2
Graduation or more	7	5.0
Illiterate	42	30.2
Diabetes Mellitus		
Yes	38	27.3
No	101	72.7
Hypertension		
Yes	41	29.5
No	98	70.5
Risk Factors for AECOPD		
Asthma	50	36.0
Smoking	40	28.8
Ischemic Heart Disease	14	10.1
Poor Compliance	26	18.7
Seasonal Variation	38	27.3

Table No.2: Risk factors of AECOPD (asthma, smoking, ischemic heart disease, poor compliance & seasonal variation) according to duration of COPD (months) (n=139)

Duration of COPD (months)	**Asthma**		**Total**	**P-value**
	Yes	**No**		
6-33 months	40(38.5%)	64(61.5%)	104	0.292
34-60 months	10(28.6%)	25	35	
Total	50	89	139	
Duration of COPD (months)	Smoking			P-value
	Yes	No	Total	
6-33 months	30(28.8%)	74(71.2%)	104	0.975
34-60 months	10(28.6%)	25(71.4%)	35	
Total	40	99	139	
Duration of COPD (months)	Ischemic heart disease			P-value
	Yes	No	Total	
6-33 months	13(12.5%)	91(87.5%)	104	0.101
34-60 months	1(2.9%)	34(97.1%)	35	
Total	14	125	139	
Duration of COPD (months)	Poor compliance			P-value
	Yes	No	Total	
6-33 months	19(18.3%)	85(81.7%)	104	0.820
34-60 months	7(20%)	28(80%)	35	
Total	26	113	139	
Duration of COPD (months)	Seasonal variation			P-value
	Yes	No	Total	
6-33 months	27(26%)	77(74%)	104	0.530
34-60 months	11(31.4%)	24(68.6%)	35	
Total	38	101	139	

Table No.3: Risk factors of AECOPD (asthma, smoking, ischemic heart disease, poor compliance & seasonal variation) according to diabetes mellitus (n=139)

Diabetes mellitus	**Asthma**		**Total**	**P-value**
	Yes	**No**		
Yes	10(26.3%)	28(73.7%)	38	0.146
No	40(39.6%)	61(60.4%)	101	
Total	50	89	139	

Diabetes mellitus	Smoking		Total	P-value
	Yes	No		
Yes	11(28.9%)	27(71.7%)	38	0.978
No	29(28.7%)	72(71.3%)	101	
Total	40	99	139	
Diabetes mellitus	Ischemic heart disease		Total	P-value
	Yes	No		
Yes	3(7.9%)	35(92.1%)	38	0.601
No	11(10.9%)	90(89.1%)	101	
Total	14	125	139	
Diabetes mellitus	Poor compliance		Total	P-value
	Yes	No		
Yes	7(18.4%)	31(81.6%)	38	0.958
No	19(18.8%)	82(81.2%)	101	
Total	26	113	139	
Diabetes mellitus	Seasonal variation		Total	P-value
	Yes	No		
Yes	13(34.2%)	25(65.8%)	38	0.265
No	25(24.8%)	76(75.2%)	101	
Total	38	101	139	

Table No.4: Risk factors of AECOPD (asthma, smoking, ischemic heart disease, poor compliance & seasonal variation) according to hypertension (n=139)

Hypertension	**Asthma**		**Total**	**P-value**
	Yes	**No**		
Yes	13(31.7%)	28(68.3%)	41	0.498
No	37(37.8%)	61(62.2%)	98	
Total	50	89	139	
Hypertension	Smoking		Total	P-value
	Yes	No		
Yes	12(29.3%)	29(70.7%)	41	0.934
No	28(28.6%)	70(71.4%)	98	
Total	40	99	139	
Hypertension	Ischemic heart disease		Total	P-value
	Yes	No		
Yes	9(22%)	32(78%)	41	0.003
No	5(5.1%)	93(94.9%)	98	
Total	14	125	139	
Hypertension	Poor compliance		Total	P-value
	Yes	No		
Yes	9(22%)	32(78%)	41	0.526
No	17(17.1%)	61(82.7%)	98	
Total	26	113	139	
Hypertension	Seasonal variation		Total	P-value
	Yes	No		
Yes	10(24.4%)	31(75.6%)	41	0.614
No	28(28.6%)	70(71.4%)	98	
Total	38	101	139	

DISCUSSION

to predict clinical outcome. The results of this study indicate that both the category and grade affect the outcome independently, and the higher the grade of subcategory, the greater the chance that the ulcer will persist or that death will occur. The most important finding of this study is that the simple PEDIS score system can also predict the outcome and may be more accurate than the more widely used system the AUC value to confirm the diagnostic accuracy of the PEDIS score system to predict the outcome of DFUs. The results of this study indicate that the PEDIS score system also has excellent capacity to predict the

outcome. In addition, our study shows that the PEDIS category scores can be summed into an aggregate PEDIS score, with a score of 7 or more being associated with a significantly greater probability of difficulties in healing. We believe that the PEDIS score system should be applied widely in clinical AECOPD affects the natural history of the disease and is associated with age, smoking, comorbidities, number of acute exacerbations, and patients' socioeconomic level.

In addition, AECOPD can decrease lung function, increase mortality, affect the quality of life, and increase socioeconomic burden. This study investigates the risk factors for AECOPD to help prevent and treat this disease and improve prognosis.[11] The main cause of COPD is smoking, which is closely related to a decline in lung function.[12] Previous studies have shown that smoking cessation can delay lung function decline and improve survival. In ours study the risk factors of AECOPD i-e asthma was noted in 50(36%) patients, smoking was seen in 40(28**.**8%) patients, ischemic heart disease in 14(10.1%) patients, poor compliance in 26(18.7%) patients & seasonal variation in 38(27.3%) patients as compare A retrospective study carried out in Taiwan showed that COPD patients having asthma had more exacerbations (35.3%) than patients with COPD alone (18.6%). Smoking is widely recognised as the major risk factor for COPD development and progression.[13]

Smokers have a faster decline in lung function and a higher mortality rate than non-smokers.[14] In a Spanish study the highest hospitalisation rate for AECOPD was in winter (37.6%), followed by autumn (24%), spring (23.7%) and summer (14.6%). Andrijevic et al reported that the most common CVDs associated with AECOPD were arterial hypertension (77.8%), systolic dysfunction (24.2%) and coronary artery disease (14.9%).[15] In our study the frequency of risk factors of AECOPD increases with the increase in age. Previous studies have shown that age is a risk factor for AECOPD, which may be due to the decline in lung function with age. These findings agree with Dong et al study, where in the risk of exacerbation increased as the disease progressed, probably because of poor lung function and other risk factors such as comorbidities and smoking.[16] In addition, disease duration was an independent risk factor for AECOPD in Dong et al study. In our study the smoking was the 2nd most common risk factor of AECOPD, was noted in 28.8% patients. Smoking is widely recognized as the major risk factor for COPD development and progression.[17] Smokers have a faster decline in lung function and a higher mortality rate than non-smokers.

In a Spanish observational, cross-sectional, multicentre study of over 1.600 COPD patients it was showed that active smoking is more frequent among exacerbator than in non-exacerbator phenotypes (58.91% in emphysema and 57.67% in chronic bronchitis phenotype, $P = 0.03$).[18-20]

CONCLUSION

In conclusion, the most common risk factors of acute exacerbation of COPD were asthma followed by seasonal variation & smoking, these factors increase with the increase in age, predominant in the rural population and male gender.

Author's Contribution:

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Drafting or Revising Critically:	Azizur Rahman, Abdul Ghaffar Khan, Muzamil Majeed
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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

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Original Article

Exploring Antenatal Women Choices Regarding Her Preferred Mode of Delivery

Beenish Samreen Hamid, Isma Rauf, Hina Khan, Saira Aslam, Bushra Nabi and Fareeha Khan

ABSTRACT

Objective: To explore the preferences and factors affecting the choice of delivery mode among pregnant women seeking antenatal care.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Obs/Gynae, DHQ Hospital & Medical College, Bannu KPK from 1st January 2023 to 28th February, 2024.

Methods: Participants were categorized based on their preferred mode of delivery, and sociodemographic data were collected through structured interviews. Factors influencing the choice of delivery mode were analyzed using descriptive statistics and inferential tests.

Results: Majority of antenatal women tend to favor vaginal delivery due to its traditional acceptance, family influence, perceived safety, quicker recovery time, early return to work and minimal adverse effects Various sociodemographic factors influence a woman's decision to opt for a specific mode of delivery including educational attainment, occupation & income, later age at marriage, anxiety about the baby's well-being, low pain in tolerance, fear of lengthy and arduous labor, desire for large family size, previous birth experience, influence of decision makers. Preference for a scheduled birth, desire to maintain sexual health.

Conclusion: The research underscores how sociodemographic factors and individual preferences interact in shaping pregnant women's decisions regarding mode of delivery. Healthcare providers must actively involve women in antenatal care, addressing their concerns, providing accurate information, and facilitating informed decision-making regarding delivery options.

Key Words: Mode of delivery, Pregnant women, Antenatal care, Normal vaginal delivery, Cesarean section, Sociodemographic factors.

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INTRODUCTION

Childbirth is a pivotal event in a woman's life, marked by profound physiological, emotional, and social changes. Central to this experience is the decision-making process surrounding the mode of delivery, whether it is vaginal birth or cesarean section (CS). This decision is influenced by a myriad of factors that intersect with individual preferences, medical considerations, cultural norms, and healthcare practices.

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Research has shown that pregnant women's preferences for delivery mode are multifaceted and dynamic, influenced by a variety of factors. Socio-demographic characteristics such as age, education, socioeconomic status, and parity have been identified as important determinants of delivery mode preference.[1,2]

Furthermore, previous birth experiences play a significant role in shaping women's preferences for specific mode of delivery. Women who have had positive vaginal birth experiences may express a preference for a similar mode of delivery in subsequent pregnancies, while those who have encountered complications or traumatic experiences during childbirth may lean towards elective cesarean sections.[3]

Medical considerations, including obstetric risk factors, maternal health conditions, and fetal well-being, also play a crucial role in determining the appropriate mode of delivery. Women with certain medical conditions or obstetric complications may have limited options and may be advised by healthcare providers to undergo cesarean delivery to mitigate risks to maternal or fetal health.[4].

Cultural beliefs and societal norms surrounding childbirth also shape women's preferences for specific birthing option. In some cultures, there may be a strong preference for vaginal birth as the natural and traditional method of delivery, while in others, cesarean section may be perceived as safer or more convenient.[5]. This trend has raised concerns among healthcare professionals, policymakers, and researchers regarding potential overuse and its implications for maternal and neonatal outcomes.[6,7] Understanding the factors driving this trend and its impact on maternal health disparities is essential for developing strategies to promote evidence-based maternity care and reduce unnecessary interventions. This article aims to explore in-depth the preferences and factors influencing the choice of delivery method among pregnant women seeking antenatal care.

METHODS

This study employed a cross-sectional design to explore the preferences and factors influencing the choice of birthing method among pregnant women seeking antenatal care. Cross-sectional studies are well-suited for capturing a snapshot of attitudes, beliefs, and behaviors at a specific point in time, making them valuable for investigating complex phenomena such as childbirth decision-making.

Participants were categorized into three groups based on their stated preferences for delivery mode. Patients Opting for Normal Vaginal Delivery (NVD): 508 Participants who expressed a clear preference for NVD. Patients Opting for Cesarean Section (C-section): 92 Participants who clearly stated a preference for C-section. Patients Undecided or Confused to Decide: 14 participants who expressed uncertainty or confusion regarding their choice of delivery mode..

Quantitative data were analyzed using descriptive statistics to summarize the demographic characteristics of the sample and the distribution of preferences for delivery mode. Chi-square tests or logistic regression analysis were employed to explore associations between socio-demographic factors, previous birth experiences, and preferences for delivery mode. Qualitative data from open-ended questions were analyzed using thematic analysis to identify common themes and patterns in participants' responses.

RESULTS

Table 1 presents the sociodemographical characteristics of the participants. Regarding age distribution, the majority of participants fell within the 25-30 age range (56.8%), followed by those below 24 (35.1%), while a smaller proportion were 31 years old and above (8.1%). In terms of education level, a significant portion of participants had completed primary school (56.6%), with a substantial number also having a high school education or higher (46.1%). Similarly, the majority of participants' husbands had a high school education or higher (56.8%). Most participants were housewives (86.8%), with a smaller percentage employed as government employees (10.6%) or in the private sector (2.6%). Regarding income, the majority reported a monthly income below PKR 50,000 (68.3%), with smaller proportions falling into the 50,000-100,000 PKR bracket (20.1%) and above 100,000 PKR bracket (11.6%). Concerning the age of marriage, the majority married between the ages of 20 and 33 (78.1%), followed by those below 19 (18.1%), with a smaller percentage marrying at 34 years old and above (3.8%).

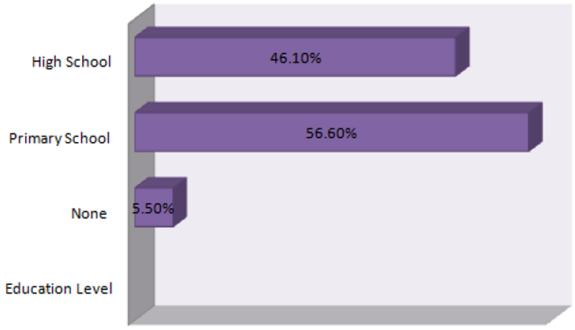

Figure No.1: Distribution of Education Levels among Study Participants

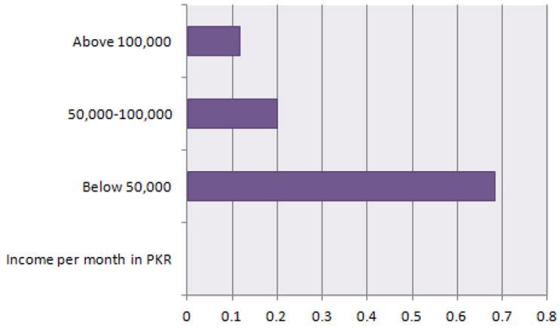

Figure No.2: Distribution of Monthly Income among Study Participants

Table 2 presents the characteristics of study subjects according to their preferred delivery type. The majority of participants opting for vaginal delivery were aged between 25 and 30 years (49.7%), residing in urban areas (64.2%), and had completed primary school education (44.3%). Additionally, a significant proportion of them reported a monthly income below PKR 50,000 (55.0%), were housewives (71.7%), married above the age of 19 (65.2%), and had experienced two or more pregnancies (58.2%). Conversely, participants opting for cesarean delivery were more likely to have husbands with a high school education or higher (56.8%), earn a monthly income above PKR 100,000 (2.5%), be government employees (3.0%), and have undergone a previous cesarean section (27.5%). Confused patients were more prevalent among those with illiterate educational status (1.2%), a monthly income below PKR 50,000 (1.3%), and a marriage age below 18 years (0.8%). These findings

suggest significant associations between sociodemographic factors and preferred delivery type among participants.

Table 3 outlines the reasons for selecting preferred delivery types among the study subjects, categorized into vaginal birth and cesarean section. Among the 508 participants who opted for vaginal birth, the leading motivation, as indicated by 74.8% of respondents, was the influence of in-laws or family since in Pashtun culture, the desire for a large family size and the preference for male babies was expressed as influential factors in opting for vaginal delivery. Other factors contributing to the preference for vaginal birth included the perception of it being healthier or better (10.8%), the desire for quick recovery and early discharge (6.8%), and the belief in childbirth as a natural process (7.8%).

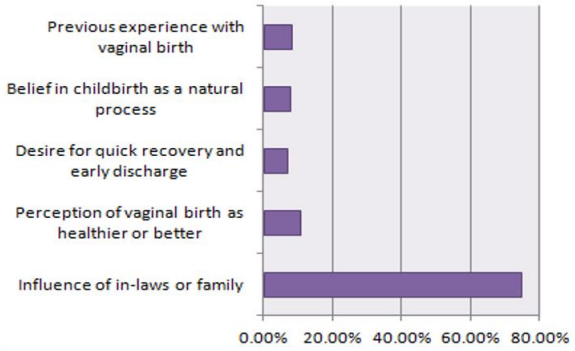

Figure No.3: illustration of the bar chart showing distribution of reasons for selecting preferred delivery types among the study subjects who opted for vaginal birth.

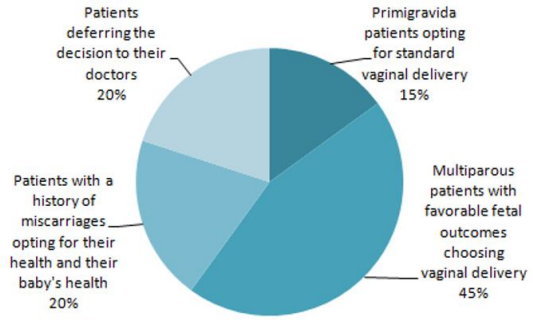

Figure No.4: Illustration of a pie chart showing delivery mode decisions among patients with

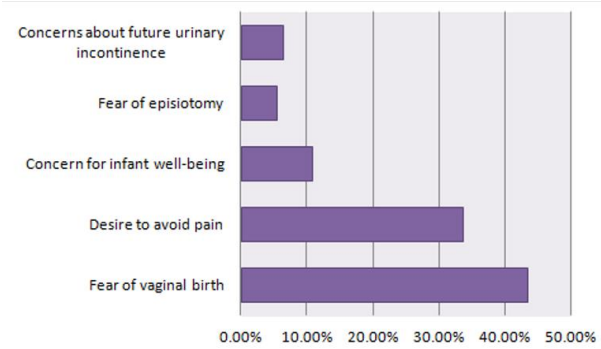

Figure No.5: illustration of the bar chart showing distribution of reasons for selecting preferred delivery types among the study subjects who opted for cesarean section

Table No.1: Sociodemographic Characteristics of Participants

Characteristics	n (%)
Age	
- Below 24	210 (35.1%)
- 25-30	341 (56.8%)
- 31 and above	49 (8.1%)
Level of Education	
- None	33 (5.5%)
- Primary school	340 (56.6%)
- High school or higher	227 (46.1%)
Husband's Education Level	
- None	9 (1.6%)
- Primary school	250 (41.6%)
- High school or higher	341 (56.8%)
Occupation	
- Housewife	521 (86.8%)
Government employee	64 (10.6%)
Private employee	15 (2.6%)
Income per month in PKR	
Below 50,000	410 (68.3%)
50,000-100,000	121 (20.1%)
Above 100,000	69 (11.6%)
Age of Marriage	
- Below 19	109 (18.1%)
- 20-33	468 (78.1%)
- 34 and above	23 (3.8%)

Table No. 2: Characteristics of Study Subjects For Preferred Delivery Type

Characteristics	Vaginal Delivery	Cesarean Delivery	Confused Patients	p-value
Age of Subjects in Years				
- Below 24	125 (20.8%)	15 (2.5%)	8 (1.3%)	0.210
- 25-30	298 (49.7%)	89 (14.8%)	4 (0.7%)	
- Above 31	49 (8.2%)	10 (1.7%)	2(0.3%)	
Participant Residing Area				
- Urban	385 (64.2%)	68 (11.3%)	10 (1.7%)	0.428
- Rural	115 (19.2%)	18 (3.0%)	4 (0.7%)	
Level of Education				

- Illiterate	28 (4.7%)	4 (0.7%)	7 (1.2%)	0.035
- Primary School	266 (44.3%)	59 (9.8%)	3 (0.5%)	
- High School or Higher	188 (31.3%)	41 (6.8%)	4 (0.7%)	
Monthly Income of Subjects (PKR)				
Less than 50,000	330 (55.0%)	58 (9.7%)	8 (1.3%)	0.003
50,000-100000	126 (21.0%)	8 (1.3%)	4 (0.7%)	
Above 100000	49 (8.2%)	15 (2.5%)	2 (0.3%)	
Occupation				
- Housewife	430 (71.7%)	77 (12.8%)	5 (0.8%)	0.03
Government Employee	42 (7.0%)	18 (3.0%)	5 (0.85)	
Private Employee	10 (1.7%)	9 (1.5%)	4 (0.7%)	
Age of marriage				
- Below 19	85 (14.1%)	15 (2.5%)	9 (1.5%)	0.004
- 20-33	396 (66%)	69 (11.5%)	3 (0.5%)	
- 34 and above	5 (0.83%)	16 (2.6%)	2 (0.3%)	
'Planned Pregnancy'				
Yes	383 (63.8%)	76 (12.7%)	10 (1.7%)	0.993
No	110 (18.3%)	17 (2.8%)	4 (0.7%)	
'Total Pregnancies'				
1	167 (27.8%)	26 (4.3%)	5 (0.8%)	0.034
≥ 2	349 (58.2%)	44 (7.3%)	9 (1.5%)	
'Number of Births'				
0	110 (18.3%)	24 (4.0%)	3 (0.5%)	0.032
≥ 1	356 (59.3%)	96 (16.0%)	11 (1.8%)	
'Previous C-section'				
Yes	58 (9.7%)	165 (27.5%)	6 (1.0%)	0.002
No	344 (57.3%)	19 (3.2%)	8 (1.3%)	
'Trimester'				
1st	84 (14.0%)	20 (3.3%)	2 (0.3%)	0.285
2nd	184 (30.7%)	44 (7.3%)	4 (0.7%)	
3rd	218 (36.3%)	36 (6.0%)	8 (1.3%)	
'Miscarriage'				
Yes	65 (10.8)	78 (13%)	9 (1.5%)	0.048
No	443 (73.8)	14 (2.3%)	5 (0.8%)	

Table No.3: Reasons for Preferred Delivery Type Among Study Subjects

Reasons Given	Vaginal Birth (N=508)	Cesarean Section (N=92)
'Reasons for Choosing Vaginal Birth'		
In Laws/Family influence	**380 (74.8%)**	
It is healthier or better	55 (10.8%)	
Vaginal birth previously	43 (8.4%)	
It is a natural process	40 (7.8%)	
Quick recovery and going home	35 (6.8%)	
Surgery anxiety	20 (3.9%)	
Early Breastfeeding	15 (2.9%)	
Fear about risk of infection	12 (2.3%)	
'Reasons for Choosing Cesarean Section'		
Vaginal birth Anxiety		**40 (43.4%)**
Avoidance of pain		31 (33.6%)
Avoidance of risk to the fetus		10 (10.8%)
Fear of episiotomy with vaginal birth		5 (5.4%)
Fear of future urinary incontinence		6 (6.5%)

Table No.4 presents the sources from which study subjects obtained information about delivery. The most commonly utilized source was a gynecologist, with 160 participants (26.6%) reporting consulting a gynecologist for information. Following closely behind, family doctors was also a significant source of information, with 120 participants (20%) relying on

them for guidance. Nurse-midwives were consulted by 102 participants (17%), indicating their importance in providing information and support during pregnancy. The internet emerged as a popular source, with 88 participants (14.6%) using online resources for information about delivery. Older family members were consulted by 65 participants (10.8%), suggesting the influence of familial advice in decision-making.

Table No.4: Study Subjects' Sources of Information About Delivery

Sources of Information	No. (%)
'Gynecologist'	160 (26.6%)
'Family Doctor'	120 (20%)
'Nurse-Midwife'	102 (17%)
'Internet'	88 (14.6%)
'Older Family Members'	65 (10.8%)
'Friends'	32 (5.3%)
'Newspaper, Television'	24 (4%)
'Neighbor'	11 (1.8%)
'Books, Encyclopedia'	8 (1.3%)

DISCUSSION

Several studies have investigated the factors influencing women's preferences for delivery mode. Consistent with our findings, a study by Stoll et al. (2019) found that women often choose NVD due to perceptions of safety, shorter recovery times, and lower costs associated with this mode of delivery.[8] Similarly, a meta-analysis by Chaillet and Dumont (2007) identified fear of labor pain as a significant factor influencing women's preference for cesarean section (C-section), highlighting the importance of addressing women's concerns and providing adequate support and pain relief during labor.[9]

The role of sociodemographic factors in shaping delivery preferences has also been explored in previous research. Our study found that educated women from higher socioeconomic backgrounds were more likely to opt for C-section, a finding supported by studies conducted in various countries.[10,11] Additionally, the influence of previous childbirth experiences on delivery mode preferences, particularly among women with a history of cesarean delivery, has been well-documented.[12,13]

Addressing misconceptions and providing comprehensive antenatal education are essential components of efforts to promote informed decision-making regarding delivery options. Studies emphasized the importance of evidence-based strategies for reducing unnecessary C-sections and preventing the first cesarean delivery, highlighting the need for collaborative efforts among healthcare providers, policymakers, and pregnant women.

Furthermore, our study identified a concerning trend among women with a history of cesarean delivery, who were more likely to opt for repeat cesarean section. This finding underscores the need for comprehensive counseling and support for women considering vaginal birth after cesarean (VBAC), as VBAC is associated with lower maternal morbidity and shorter recovery times compared to repeat cesarean delivery.[14]

CONCLUSION

In conclusion, our study highlights the prevailing preference for vaginal delivery among pregnant women seeking antenatal care, with only a minority opting for cesarean section. The decision-making process regarding birthing options is influenced by a myriad of factors, including sociodemographic characteristics, previous childbirth experiences, and perceptions of safety and risk. Majority of antenatal women tend to favor vaginal delivery due to its perceived safety, the influence of decision makers (husband or mother-father in laws), quicker recovery time, and minimal adverse effects.

By understanding the complex interplay of factors influencing preferred mode of delivery, healthcare providers can tailor their care to meet the diverse needs of pregnant women, ultimately improving maternal and neonatal health outcomes. Further research is warranted to explore the long-term implications of specific delivery choices on maternal and infant health and to inform evidence-based strategies for optimizing obstetric care.

Author's Contribution:

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Drafting or Revising Critically:	Saira Aslam, Bushra Nabi, Fareeha Khan
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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

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Original Article

Comparison of Pulsed Lavage Versus Manual Pressurised Lavage in Preventing Postoperative Infection Rate in Total Knee Arthroplasty

Raja Ehtesham Ul Haq Khan, Zohaib Nadeem, Sajjad Hassan Orakzai, Syed Ahmad Bilal, Haroon Javed and Aleena Salman

ABSTRACT

Objective: To compare the effectiveness of pulsed lavage versus manual pressurized lavage in preventing postoperative infection, as measured by CRP levels and clinical outcomes, in patients undergoing TKA.

Study Design: Prospective observational cohort study

Place and Duration of Study: This study was conducted at the Shifa International Hospital Islamabad during August 2024 till January 2025.

Methods: A total of 173 patients undergoing TKA were included and divided into two groups based on the type of lavage used: pulsed lavage (n = 87) and manual pressurized lavage (n = 86). Data were collected using validated questionnaires during hospitalization and follow-up visits. CRP levels were recorded on postoperative Day 3, Week 2, and Week 6. Clinical signs of infection and recovery parameters were also assessed.

Results: CRP elevations were observed in 6 patients (3 in each group), with no significant differences in mean CRP levels at any time point ($p > 0.05$). No clinical infections were reported in either group. Healing time, pain scores, and patient satisfaction were comparable between groups. There were no statistically significant differences in postoperative outcomes or infection-related markers.

Conclusion: It is concluded that pulsed lavage and manual pressurized lavage are equally effective in preventing postoperative infections in TKA. Both techniques demonstrated similar inflammatory responses and recovery outcomes. Therefore, the choice of lavage method may be guided by availability, cost, and surgeon preference rather than clinical advantage.

Key Words: Total knee arthroplasty, pulsed lavage, manual pressurized lavage, postoperative infections, C-reactive protein, infection prevention.

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INTRODUCTION

Total Knee Arthroplasty is a definitive treatment procedure for restoring complete function in patients with advanced knee osteoarthritis. There has been an increased demand for surgeries preserving mobility in an aging population[1].

Total knee arthroplasty delivers important benefits yet patients face major difficulties from postoperative complications particularly infections which result in extended hospitalization and the requirement of implant revisions or potentially lead to implant failure[2]. Total knee arthroplasty stands as a common surgical intervention which treats end-stage knee pain and functional limitations that stem from osteoarthritis disease. The combination of innovative surgical approaches together with advanced prosthetic development and improved operative management has enhanced the outcomes of total knee arthroplasty[3]. Among total knee arthroplasty-related complications periprosthetic joint infection stands as the most feared and damaging outcome[4]. The low rates of 0.5 to 2 percent do not eliminate the severe consequences of these infections since they extend hospital time and necessitate revision operations and higher healthcare expenses while decreasing patient life quality. The prevention of infections in total knee arthroplasty represents both an essential clinical obligation and a vital health system reliability mandate[5]. Intraoperative conditions provide surgeons with their main chance to reduce infection risks. Among many operative factors surgical site irrigation serves as a key mechanism for mechanical removal of blood and bone debris combined

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with microbial contamination[6]. Through proper irrigation, the microbial load decreases and stops bacterial biofilms from forming while these biofilms demonstrate resistance to antibiotics and the body's immune cleanup mechanisms. Two standard irrigation techniques exist for orthopedic surgical procedures. Two common surgical site irrigation techniques include pulsed lavage and manually pressurized lavage. Operating devices produce intermittent bursts of high-pressure fluid delivery for pulsed lavage procedures[7]. Deep tissue purifications benefit from this method which combines efficient contaminant removal with minimization of tissue-damaging pulsatile flow effects. The controlled pressure settings on pulsed lavage systems produce uniform debridement output that potentially improves the surgical area's cleanliness.

Patients receive irrigation solutions through syringes and gravity-assisted bags as components of manually pressurised lavage. Although affordable and easy to use the manual pressurised lavage system faces problems with inconsistent surgical practices and unpredictable pressure delivery and operator fatigue[8]. Manual lavage is favored by surgeons because the procedures minimize soft tissue damage and generates no mechanical sounds that might disturb the operating room[9]. Although orthopedic centers utilize these methods persistently for total knee arthroplasty infection prevention the available evidence fails to demonstrate clear superiority of one technique over the other[10]. Laboratory studies and revision arthroplasty research show mechanical cleaning benefits from pulsed lavage while primary knee arthroplasty clinical outcomes remain poorly documented in this area. The available research faces critical limitations through its small sample sizes as well as retrospective designs and insufficient long-term follow-ups which compromises its general clinical use[11].

METHODS

This Prospective observational cohort study was conducted at Shifa International Hospital Islamabad during August 2024 till January 2025.

Inclusion criteria

- Patients undergoing total knee arthroplasty (TKA) for osteoarthritis, rheumatoid arthritis, or other joint-degenerative conditions
- Patients must receive either pulsed lavage or manual pressurized lavage during surgery as the primary irrigation technique
- Patients with complete postoperative records post-surgery to monitor infection status.

Exclusion criteria

- Patients with a pre-existing infection in or around the knee joint before surgery.
- Patients with known immunodeficiencies, such as HIV/AIDS, active chemotherapy, or other conditions affecting immune function.
- Patients with missing or incomplete postoperative records, making it impossible to assess infection outcomes accurately.
- Patients with known allergies to solutions used in either lavage method.

Data collection: Data were collected using a structured, pre-validated questionnaire administered to patients during hospitalization and at follow-up visits. The questionnaire included both objective clinical outcomes and patient-reported measures. Demographic information, comorbidities, and the type of lavage used were recorded at baseline. Participants were divided into two groups based on the type of intraoperative irrigation method used:

- Group A (n = 87): Underwent intraoperative pulsed lavage.
- Group B (n = 86): Received manual pressurised lavage.

All procedures were carried out by the Orthopedic Department at Shifa International Hospital Islamabad. One surgical team used pulse lavage, while the other used manual pressurized lavage, both following the same standard protocols to minimize variability. Although the same surgical approach—a standard medial parapatellar approach—was used in all cases, the type of anesthesia varied. Most procedures were performed under spinal anesthesia, but some patients received spinal combined with general anesthesia, spinal with epidural, or other combinations as clinically indicated. Cemented, posterior-stabilized prostheses were used in all cases. Both groups received prophylactic intravenous antibiotics (Zinacef 1.5g) administered preoperatively and continued for 24 hours postoperatively. Postoperatively, the questionnaire captured signs and symptoms of surgical site infection, such as redness, warmth, discharge, and fever, as reported by the patient and corroborated by clinical examination. Data on pain levels, wound healing time, satisfaction, complications, and any subsequent interventions or readmissions were also collected.

Statistical Analysis: Data were analyzed using SPSS v26. Categorical data such as infection rates and complication frequencies were compared using the Chi-square test. Continuous variables including pain scores and healing times were compared using independent t-tests. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Data were collected from 173 patients. The mean age in the pulsed lavage group was 66.4 ± 7.8 years, while in the manual lavage group it was 67.1 ± 8.1 years ($p = 0.51$). Gender distribution was balanced, with males comprising 48.3% (n = 42) and females 51.7% (n = 45) in the pulsed lavage group, compared to 47.7% (n = 41) males and 52.3% (n = 45) females in the manual lavage

group (p = 0.88). The prevalence of diabetes was 23.0% (n = 20) in the pulsed group and 24.4% (n = 21) in the manual group (p = 0.72), while hypertension was present in 45.9% (n = 40) and 44.2% (n = 38) of patients, respectively (p = 0.79).

Table No.1: Baseline Demographic and Clinical Characteristics

Characteristic	Pulsed Lavage (n = 87)	Manual Lavage (n = 86)	p-value
Mean age (years)	66.4	67.1	0.51
Male, n (%)	42 (48.3%)	41 (47.7%)	0.88
Female, n (%)	45 (51.7%)	45 (52.3%)	0.88
Diabetes, n (%)	20 (23.0%)	21 (24.4%)	0.72
Hypertension, n (%)	40 (45.9%)	38 (44.2%)	0.79

Table No.2: Postoperative CRP Levels in Pulsed Lavage vs. Manual Lavage Groups

Time Point	Pulsed Lavage (Mean ± SD)	Manual Lavage (Mean ± SD)	p-value
Day 3	47.8 ± 11.9	48.1 ± 12.3	0.89
Week 2	21.3 ± 7.6	21.7 ± 8.0	0.83
Week 6	7.1 ± 3.0	7.4 ± 3.5	0.77

On Day 3, the mean CRP level was 47.8 ± 11.9 mg/L in the pulsed lavage group and 48.1 ± 12.3 mg/L in the manual lavage group (p = 0.89). At Week 2, levels declined to 21.3 ± 7.6 mg/L and 21.7 ± 8.0 mg/L, respectively (p = 0.83). By Week 6, CRP levels further decreased to 7.1 ± 3.0 mg/L in the pulsed group and 7.4 ± 3.5 mg/L in the manual group (p = 0.77).

Out of 173 patients, only six exhibited elevated CRP levels postoperatively, with three cases (3.4%) in the pulsed lavage group and three cases (3.5%) in the manual lavage group. Importantly, no clinical infections were observed in either group during the follow-up period.

Table No.3: Patients with Elevated CRP and Clinical Infection Incidence

Group	Patients with Elevated CRP (n, %)	Clinical Infections Observed (n, %)
Pulsed Lavage	3 (3.4%)	0 (0.0%)
Manual Lavage	3 (3.5%)	0 (0.0%)

The mean healing time was 14.6 ± 2.9 days in the pulsed lavage group and 14.9 ± 3.1 days in the manual lavage group. Pain scores at Week 6 were also similar, with averages of 2.3 ± 1.1 and 2.5 ± 1.2, respectively. Patient satisfaction scores were high in both groups, measured at 8.9 ± 0.6 for pulsed lavage and 8.7 ± 0.7 for manual lavage (Figure 1).

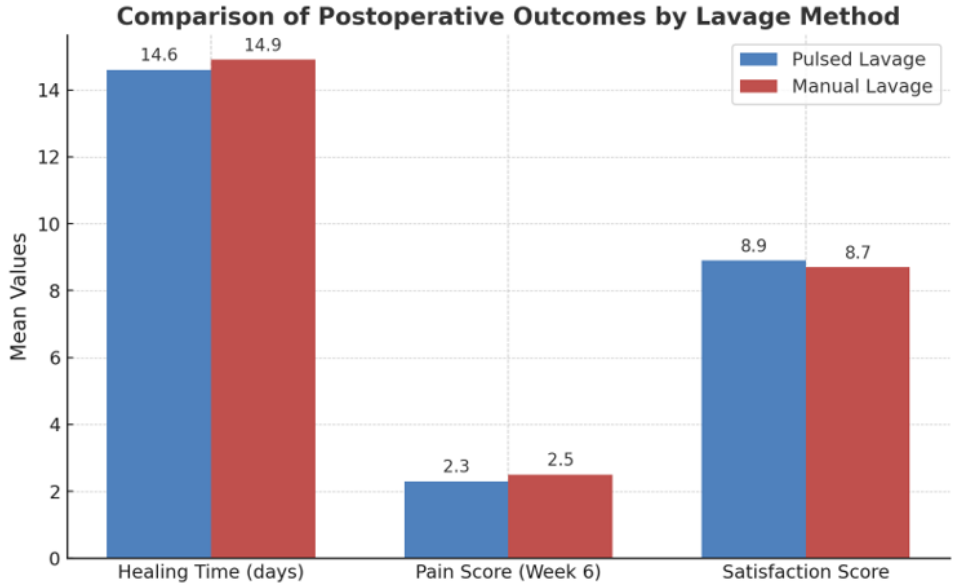

Figure No.1: Postoperative Outcomes and Patient Recovery

DISCUSSION

The present study aimed to compare the efficacy of pulsed lavage and manual pressurized lavage in reducing postoperative inflammatory markers and infection rates among patients undergoing total knee arthroplasty. Postoperative CRP measurements revealed minimal elevations in a subgroup of patients from each group with no significance detected between lavage

methods for CRP assessments or clinical recovery metrics. Clinical measurements of systemic inflammatory response through CRP values remain similar between patients in Day 3, Week 2 and Week 6 assessments regardless of irrigation method. Pulsed lavage did not demonstrate superior debris removal or lower bacterial levels when compared to manual lavage according to research from previous laboratory and animal model studies[12]. The theoretical advantages identified from experimental studies did not lead to corresponding differences in infection rates or change inflammatory markers such as CRP when tested on clinical patients. Elevations in CRP cannot be used to determine clinical infection because findings from six patients showed clinical infection did not develop despite elevated CRP[13]. Thus, mild CRP elevations postoperatively require interpretation with additional clinical indicators. Both techniques showed comparable results related to patient satisfaction and healing times and postoperative pain scores for the patients undergoing these procedures. This indicates that TAL nicely matches PL for surgical wound management. Multiple recent clinical trials have shown identical outcomes regarding periprosthetic joint infection prevention between different lavage techniques and our study aligns with this clinical evidence[14]. Aljaafri et al. (2021) and Bottner et al. (2020) conducted studies where pulsed lavage proved equally effective to manual irrigation for orthopedic procedure infection prevention. The usefulness of these research results supports decisions about surgical organization and budget management[15]. While pulsatile lavage is widely used for wound irrigation, especially in orthopedic and trauma settings, several concerns have been raised regarding its safety in soft tissue management. High-pressure pulsatile lavage has been shown in vitro to cause significant bone damage and intramedullary bacterial dissemination in contaminated tibial fractures[13]. Reports also document the risk of air embolism during pulsed saline lavage of pelvic fractures, and inadvertent air introduction into muscle tissue can lead to perioperative complications. Moreover, recent studies suggest that high-pressure lavage may drive bacteria deeper into soft tissues, potentially increasing the risk of infection. Although the extent of bacterial penetration into deeper layers remains unclear, the mechanical force of lavage at pressures as low as 0.14 N/mm² has been associated with irreversible tissue injury, including myonecrosis and dystrophic calcification in animal models[16]. The limitations of this study include its non-randomized design, which may introduce selection bias as group allocation depends on the operating surgeon's standard practice. Additionally, while CRP is a useful marker of inflammation, it is non-specific and may not fully reflect localized infection risks.

CONCLUSION

It is concluded that there is no significant difference between pulsed lavage and manual pressurized lavage in terms of reducing postoperative infection rates and CRP levels in patients undergoing total knee arthroplasty. Both irrigation techniques demonstrated similar clinical outcomes, including comparable healing times, pain levels, and patient satisfaction scores. Although pulsed lavage has been suggested to offer theoretical advantages in surgical decontamination, this study did not find any clinical superiority over manual lavage within the observed follow-up period.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Raja Ehtesham Ul Haq Khan, Zohaib Nadeem, Sajjad Hassan Orakzai
Drafting or Revising Critically:	Syed Ahmad Bilal, Haroon Javed, Aleena Salman
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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

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Dated 06.07.2024.

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Original Article

Retrospective Analysis to Compare Prognostic Outcomes of Endovascular vs Open Bypass in Critically Limb Threatening Ischemia (CLTI); A Single Centre Cohort

Farhina Salahuddin, Syed Zain Ali Shah, Muhammad Fahad Tariq Berlas, Waryam Saleh, Irfan Tariq Keen and Muhammad Muqeem

ABSTRACT

Objective: This study aims to compare the outcomes of open vs. endovascular revascularization.
Study Design: A retrospective observational study
Place and Duration of Study: This study was conducted at the Department of Vascular and Endovascular Surgery, Shaheed Mohtarma Benazir Bhutto Institute of trauma, Karachi from January 2021 to November 2023.
Methods: A retrospective observational study conducted during 4 years period in all patients of CLTI underwent revascularization. primary patency at 1 year, survival for 6 months, amputation free survival for 1 year, and ambulatory status and limb salvage rates were examined.
Results: We analyzed a final sample size of 247 patients with 80.5% (n=207) males and a mean age of 55.85 years. 64.2% (n=165) of our patients were diabetic, 27.9% (n=123) had known hypertension, 28% (n=72) had ischemic heart disease and 6.6% (n=17) had had strokes. The salvage rate post-intervention varied for open bypass at 80.45% (n=107), endovascular approach at 76.92% (n=90) and hybrid procedures at 71.42% (n=5). The rate of major amputations was found to be 21.8%(n=56). At 6 months, 76.6% of the patients were still alive 68.48% did not undergo any major amputations.
Conclusion: Our study demonstrates that both endovascular and open bypass approaches achieve satisfactory and equivalent limb salvage and patency rates in patients with CLTI. Further high-quality research is needed to establish evidence-based guidelines, ultimately improving outcomes in this high-risk population.
Key Words: Critical Limb threatening Ischemia, peripheral arterial disease, open vs. endovascular, outcomes, amputation free survival.

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INTRODUCTION

Peripheral arterial disease (PAD) or Lower Extremity Arterial Disease (LEAD) when talking specifically about the lower limbs, is commonly used to refer a spectrum of lower limb arterial insufficiency ranging from asymptomatic limb to critical limb threatening ischemia (CLTI).[1] CLTI is a severe manifestation of PAD and clinically presents as rest pain or tissue loss or both.

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The presence of either rest pain or tissue accompanied by appropriate hemodynamic evidence is enough to qualify the disease as CLTI.[2]
Ischemic rest pain is described as any pain in the leg or foot, worsened by resting the affected limb flat on a surface and relieved by hanging the foot off, accompanied by evidence of impaired blood flow.[2] whereas non-healing ulceration or gangrene of any part of the foot and accompanied by evidence of arterial insufficiency is termed tissue loss.[3]
The prevalence of PAD is approximately 6%[4] of the worldwide adult population and advanced symptomatic PAD affects 500 to 1000 people per million every year and is overall present in 0.4% of the world population. Between 120 to 500 per million people are at risk of major limb loss every year attributable to CLTI.[5]
Established risk factors for PAD include smoking, diabetes, old age, dyslipidemia, hypertension, obesity and chronic kidney disease.[4] Senility appears itself to be a significant risk factor for LEAD as the disease manifests after the age of 50 years.[5] Gender and socioeconomic status also influence PAD progression as more common in male while in the developing

world, more women than men are affected.[5] Smoking is particularly strongly associated with PAD and the risk proportionally rises with smoking intensity.[6]

Hypertension is also a known risk factor for PAD.[6,7] In Emdin et al., reports 44,329 incident LEAD events, a 20 mmHg increase of Systolic BP was associated with 63% increased risk for LEAD.[8]

Diabetes is strongly associated with PAD and usually has worse outcomes including a higher amputation risk; roughly five times higher than in non-diabetics.[5,9]

METHODS

We conducted a retrospective observational study at the Department of Vascular and Endovascular Surgery, Shaheed Mohtarma Benazir Bhutto Institute of trauma, Karachi with Non-probability consecutive sampling. All patients included from January 2021 to November 2023 with CLTI who underwent revascularization either via open bypass surgery or endovascular approach of all ages and both genders for CLTI affecting the lower limb. Patient with revascularization procedure done in the upper limbs, procedure abandoned midway for any patient-related or technical factors and incomplete data in patient record.

Data Collection and analysis: Patient were identified by review of patient's medical record and operative logs. Patients' basic demographic profile, stage and severity of the disease, revascularization procedure undertaken, outcomes, and complications was recorded. Follow-ups up to 1 year were extracted to get information on amputation free survival, major and minor amputations, survival, graft patency and ambulatory status. All patients lost to follow-up were contacted by a team of researchers. Data was registered in a pre-designed questionnaire and analyzed by statistical package for social science (SPSS inc, Chicago, IL) version 26. Mean and standard deviation was calculated for quantitative variables with normal distribution while median (IQR) was reported for non-normally distributed quantitative variables. Frequency and percentages calculated for qualitative variables like gender and comorbidities. For the analysis of qualitative variables, the chi-squared test was used to compare the outcomes and demographic as well as comorbids. P value less than 0.05 was considered statistically significant.

RESULTS

Among 247 patients, 80.5% (n=207) were male and 19.5% (n=50) were female, with a mean age of 55.85 years (males: 56.5 years, females: 53.02 years). Diabetes was present in 64.2% (n=165), hypertension in 47.9% (n=123), ischemic heart disease in 28% (n=72), and cerebrovascular accident history in 6.6% (n=17). Dialysis-dependent chronic kidney disease was seen in 0.008% (n=2). Smoking history was recorded in 44% (n=114), significantly correlating with male gender (p=0.000).

Presentation included concomitant rest pain and tissue loss in 67.7% (n=174), tissue loss only in 22.2% (n=57), and rest pain only in 10.1% (n=26). Tissue loss was significantly higher in men (74.3%, n=191) vs. women (15.6%, n=40; p=0.005). Rest pain and tissue loss combined was more common in men (58%, n=149) than women (9.7%, n=25).

Diagnostic imaging included Digital Subtraction Angiography (DSA) in 61.5% (n=158) and CTA in 37.7% (n=97). DSA was used in 46.7% (n=120) of diabetic patients. Fem-popliteal disease was the most common (54.8%, n=141), followed by Aorto-Iliac disease (23.7%, n=61).

Among 257 patients, 51.8% (n=133) underwent open surgery, 45.5% (n=117) had endovascular procedures, and 2.7% (n=7) had hybrid procedures. Stenting was performed in 9.3% (n=24) and was significantly associated with supra-inguinal and femoral disease (p<0.000). Open revascularization included Fem-distal bypasses (50%, n=69) and Fem-pop bypasses (24.6%, n=34).

The overall limb salvage rate post-intervention was 78.6% (n=202), with a 1-year patency rate of 71.2% (n=183). Patency varied by procedure: open bypass (80.45%, n=107), endovascular (76.92%, n=90), and hybrid (71.42%, n=5), with no significant difference (p=0.712). Salvage rates for synthetic grafts (80.77%, n=21) and native grafts (80.91%, n=89) were comparable, with no significant correlation to primary patency (p=0.517) or limb salvage (p=0.987). Re-intervention rates were 9.9% (n=11) for native grafts vs. 19.23% (n=5) for synthetic grafts (p=0.183).

Minor amputations occurred in 42.41% (n=108), including single toes (57.8%, n=63), multiple toes (18.34%, n=20), and tarso-metatarsal amputations (23.14%, n=25). Major amputations were recorded in 21.8% (n=56), comprising below-knee (58.93%, n=33) and above-knee amputations (41.07%, n=23).

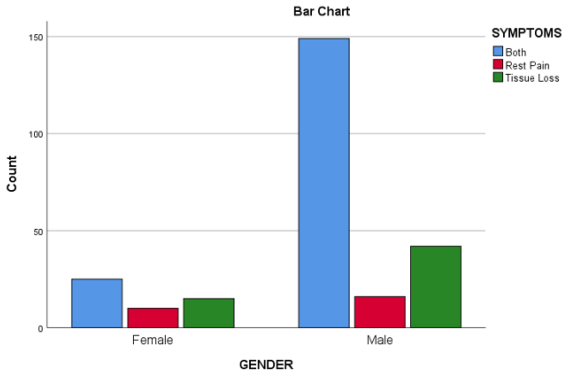

Figure No.1: Bar Chart with gender

Survival tracking showed 12.8% (n=33) mortality within 6 months, 45.5% (n=117) survival up to 6 months, and 31.1% (n=80) survival beyond 1 year. Follow-up was lost for 10.5% (n=27). Major

amputations were performed in 21.78% (n=56) within 6 months of intervention. Amputation-free survival was >6 months in 43.58% (n=112) and >1 year in 24.9% (n=64), with 9.73% (n=25) having unknown AFS due to loss of follow-up.

At 6 months, 10.1% (n=26) were bedbound, 28% (n=72) ambulated with support, and 50.2% (n=129) walked independently.

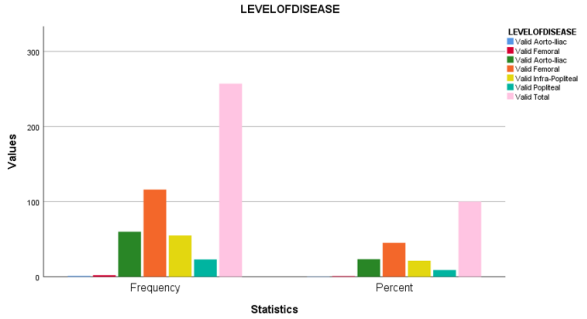

Figure No.2: Level of Disease with statistics

Table No.1: Parameters with percentage

Parameter	Percentage	Total
Gender	Males	80.5%(n=207)
Risk factors	Females	19.5(n=50)
	Diabetes	64.2%(n=165)
	Hypertension	47.9(n=123)
	Ischemic Heart Disease CKD CVA Smoking	28%(n=72) 0.008%(n=2) 6.6%(n=17) 44%(114)
Presentation	Rest pain Tissue loss Both	10.1%(n=26) 22.2%(n=57) 67.7%(n=174)
Imaging	CTA DSA	37.7%(n=97) 61.5%(n=158)
Level of Disease	Fem-Popliteal Aorto-Iliac Infra-Popliteal	54.9%(n=141) 23.7%(n=61) 21.4%(n=55)
Type of Principal Intervention	Open Fem-Fem crossover Aorto-Iliac Aorto-Fem Axillo-Fem Fem-Popliteal Fem-Distal Pop-Distal	51.8% (n=133) 3.6% (n=5) 1.4% (n=2) 8.0% (n=11) 5.1% (n=7) 24.6% (n=34) 50%(n=69) 24.6%(n=34)
	Endovascular Stenting	45.5%(n=117) 9.3%(n=24)
	Hybrid	2.7%(n=7)
Conduit	Native graft Synthetic graft	43.2%(n=111) 10.1%(n=26)
Post-procedure	ICU Stay Re-admission Re-intervention	14.4%(n=37) 45.9%(n=118) 13.6%(n=35)
Salvage		78.6%(n=202)
Amputations	Minor Major	42.41%(n=108) 21.8%(n=56)

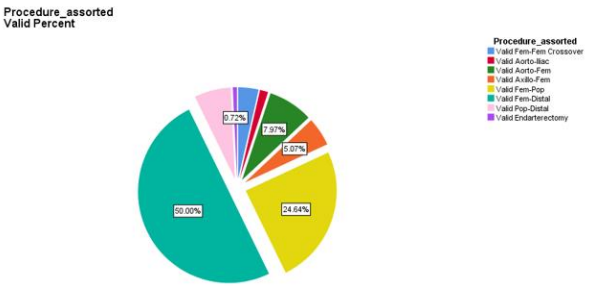

Figure No.3: Procedure assorted valid percentage

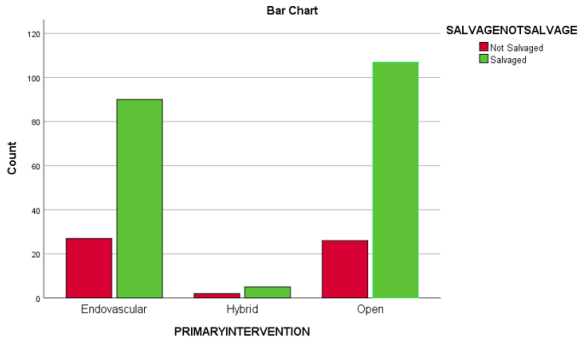

Figure No.4: Primary Intervention with Salvagenotsalvage

DISCUSSION

Our retrospective analysis evaluates the prognostic outcomes of endovascular versus open bypass interventions in patients presenting with chronic limb-threatening ischemia (CLTI). This study provides valuable insights into patient demographics, comorbidities, disease patterns, and procedural outcomes.

Our sample predominantly consisted of male patients (80.5%) with a mean age of 55.89 years. This is consistent with prior studies which have indicated a higher prevalence of peripheral arterial disease (PAD) among men in Pakistan[10]. Diabetes mellitus (64.2%) and hypertension (27.9%) were the most common comorbidities, consistent with previous studies which have shown the association of these conditions with PAD.[5] Additionally, the significant association of smoking with male gender (p=0.000) reinforces the established link between smoking and PAD progression. With many previous studies highlighting smoking as a modifiable risk factor that confers a three-to-four-fold increase in risk of developing PAD.[11-13]

The higher rate of tissue loss in men compared to women (p=0.005) may reflect gender-related differences in healthcare seeking behaviour[5] vascular anatomy, hormonal influences, and smoking prevalence. Further investigation into gender-specific factors contributing to disease severity is warranted.

In our setup, Digital Subtraction Angiography (DSA) was the most commonly used diagnostic modality (61.5%). This was likely due to its superior resolution and its ability to be concurrently diagnostic and

therapeutic.[14] The increased use of DSA may also be correlated with the high prevalence of diabetes in our cohort. While CTA (31.7%) serves as a non-invasive alternative, its role has been shown to be limited in diabetic patients with significant calcification or renal dysfunction.[15-18]

Fem-popliteal disease (54.8%) was the most common anatomical site, aligning with prior studies that identify this segment as a frequent site of atherosclerotic occlusion in CLTI. This pattern may be attributed to the vessel's length, anatomical bends, and exposure to mechanical stress, predisposing it to atherosclerosis and occlusion.

The overall limb salvage rate of 78.6% and similar rates across open bypass (80.45%), endovascular (76.92%), and hybrid approaches (71.42%) suggest that all techniques are viable options for limb preservation. This finding is consistent with a recent meta-analysis conducted by Richard et al in 2024 which found no significant difference in vessel patency rates between the two procedures. Richard et al, also reported no significant difference in the amputation free survival and All-Cause mortality rates between the two populations.[19] This lack of statistically significant difference in outcomes (p=0.712) underscores the importance of individualized treatment plans; where the choice of procedure is guided by lesion characteristics, patient comorbidities, and operator expertise.[20]

With regard to the different graft media; for synthetic conduits, including PTFE and Dacron, the salvage rate was calculated to be 80.7% compared to native grafts which had a salvage rate of 80.91%. Similarly, primary patency was found to be 71.82% in native grafts and 65.38% in synthetic conduits. The type of conduit used did not significantly correlate with primary patency (p=0.517) and limb salvage (p=0.987). These findings are contrary to previous results where a previously conducted systematic review and meta-analysis by Ambler et al in 2018 revealed that natural grafts had better primary patency when compared to synthetic grafts.[21] When analyzing various synthetic grafts however, the scientific literature has reached a consensus. Two recently conducted meta-analyses by Roll et al[22] and Takagi et al[23], revealed no clear superior between the two conduits when it comes to primary patency.

Minor amputations were performed in 42.41% of patients, with single-toe amputations being the most common. Major amputations occurred in 21.8%; these were predominantly below the knee (58.93%). Notably, all major amputations occurred within 6 months of the primary intervention, emphasizing the need for vigilant post-operative monitoring and timely secondary interventions. Functional recovery varied, with just around 50% of patients regaining independent ambulation. This emphasizes the importance of rehabilitation in optimizing post-procedural outcomes

CONCLUSION

Our study demonstrates that both endovascular and open bypass approaches achieve satisfactory and equivalent limb salvage and patency rates in patients with CLTI. This absence of significant differences supports a patient-centered approach, emphasizing individualized treatment plans based on various factors. Moreover, Taking the existing literature into account it is evident that further high-quality research is needed to establish evidence-based guidelines, ultimately improving outcomes in this high-risk population.

Limitations: Despite its many strengths, our study has some limitations that need to be taken into account when analyzing its findings. These include its single-center design, which may affect generalizability. Furthermore, the retrospective nature limits control over confounding variables. Moreover the follow-up durations may not fully capture long-term outcomes of patients, particularly mortality rates and functional recovery.

Author's Contribution:

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Drafting or Revising Critically:	Waryam Saleh, Irfan Tariq Keen, Muhammad Muqeem
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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Original Article

The Impact of Aortic Stiffness on the Development of Coronary Artery Disease Using Echocardiography

Nawras Rabea Fawaz[1], Najeeb Hassan Mohammed[1] and Ghazi Farhan Haji[2]

ABSTRACT

Objective: To correlate to the echocardiographic data with coronary angiographic finding, investigate the relation of aortic stiffness with coronary artery disease using echocardiography.

Study Design: A case control study

Place and Duration of Study: This study was conducted at the Cardiac Care Unit, Baghdad Teaching Hospital, Iraq from 1st November 2023 to 1st July 2024.

Methods: A total of 100 adult people, 50 patients with coronary artery disease and other 50 healthy participants matched with case group in age and gender were enrolled. The collected data of all patient's information including history blood pressure measurement and pulse measurement. We used transthoracic echocardiography to measure the dimension of ascending aorta, thickness of the wall, maximum systolic and diastolic aortic dimension depending on reference points on the patient ECG which was connected to the echocardiography. Then the patient was admitted to the catheterization lab for coronary angiography. After that, we compared the results of the measures from the transthoracic echo study with the report on coronary angiography.

Results: The blood pressure measurements and aortic dimensions along with wall thickness measurements were significantly higher in coronary artery disease patients with catheterization when compared to control subjects. The measurements of aortic wall thickness revealed statistically significant positive relationships between blood pressures that measured systolic and diastolic pressure values as well as aortic diameter measurements in both their systolic and diastolic states.

Conclusion: A significant correlation found between aortic stiffness and coronary artery disease.

Key Words: Coronary artery disease, Aortic stiffness, Transthoracic echocardiography

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INTRODUCTION

Coronary artery disease (CAD) which goes by the alternative name ischemic heart disease (IHD) functions as the principal fatal condition together with the cause leading for the disability-adjusted life years (DALYs) worldwide.[1-3] The disease advances because of atherosclerosis in coronary arteries although some individuals show no indications of the condition. Patients with CAD show three important presentations, acute coronary syndrome (ACS) in addition to silent myocardial ischemia (MI) and stable angina.

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The American Heart Association (AHA, 2019) reports that CAD affects 31% of elderly male population while 25.4% of elderly females experience the condition.[4]

Cardiovascular disorders (CVD) are thought to be mostly caused by atherosclerosis. IHD and ischemic stroke are two of the principal effects of atherosclerotic cardiovascular disease on the heart and brain.[5] The leading and fifth causes of death worldwide, respectively, are IHD and stroke. Atherosclerosis can affect arteries anywhere in the body, even though it is frequently associated with heart problems.[6] In arteries, a strong cushioning effect is typically provided by systemic conduit arteries, allowing the microvasculature to have practically constant flow even in the face of periodic left ventricular (LV) ejection.[7] The artery stiffness compromises this cushioning function, which has a number of negative effects that significantly affect cardiovascular health.[8] The extent to which an elastic structure opposes change in its size defines its stiffness rating. Doctors do not directly measure arterial wall stiffness inside the body but use parameters including arterial pulse wave velocity (PWV) to evaluate stiffness indirectly by studying arterial pressure changes in volume and cross-sectional area and diameter.[9] Medical professionals use pulse

wave velocity and pulse wave analysis as their main tools for assessing arterial stiffness at present.[10] Outpatient screening purposes exclude the use of angiography due to its risks together with limitations that limit its utility beyond specialized clinical evaluation. The assessment of cardiovascular risk would be more effective with non-invasive solutions that measure coronary artery wall thickness.[11]

Echocardiography which is regularly used to inspect cardiac structure, and function has evolved substantially to provide precise examination of arterial structures while assessing their functions and hemodynamics.[12] Current TTE technology with its advanced high-resolution probes enables medics to perform accurate wall thickness measurements of the left main coronary artery (LMCA).[13] The measurement for cardiovascular risk shows direct relevance to carotid intima-media thickness (C-IMT) assessments that doctors currently use as the standard non-invasive marker for cardiovascular risk. In this research, echocardiographic assessment was used to examine the relationship between aortic stiffness and coronary artery disease.

METHODS

This is a case control study performed at Cardiac Care Unit (CCU), Baghdad Teaching Hospital, during a period of eight months from 1st November 2023 to 1st July 2024. This study included 100 adult people divided into two groups: **Case group:** Included 50 patients have complaints as dizziness, dyspnea, fatigue, chest or epigastric pain, and elevated blood pressure. They were diagnosed with CAD and admitted to the CCU for elective cardiac catheterization or patients with symptomatic acute coronary syndrome (ACS) confirmed by ECG. **Control group:** Included 50 healthy volunteers participants matched with cases in age and gender.

Obese patients with poor window, poor imaging diagnostic, and sever aortic stiffness that impact the measurements of wall diameter through the cardiac cycle, patients with history of chronic renal failure (CRF) or liver failure (LF), those who had history of coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI) procedure, and those who refused to be part of this study were excluded.

The data was collected by a well-designed questionnaire including socio-demographic and clinical characteristics. The blood pressure of Systolic and diastolic and heart beats were measured. The body mass index (BMI) was calculated by the same scale for all the subjects (kilograms/square meters).[16] The participants were classified as follows:

- Normal (18.5 – 24.9 kg/m2).
- Overweight (25 – 29.9 kg/m2).
- Obese (≥ 30 kg/m2).

✓ We used 2d echocardiography technique to measure the dimension of ascending aorta, thickness of the wall, maximum systolic and diastolic dimension depending on reference points on the patient's ECG which was connected to the Echo device.

✓ Then the patient was admitted to the theater for catheterization.

✓ After that, we compared the results of the measures from the Echo study with the report of cardiac CATH.

The echocardiography machine is a digital device (vivid E9, with XDclear, made in japan, probe M5Sc-D). It was used to measure the dimensions of the ascending aorta as shown in figure 1.

Technique

- ❖ Attached the standard lead ECG to the participant to monitor the heart's electrical activity.
- ❖ The participant was lied in a left lateral decubitus position, as this help improve access to the heart for imaging, which helps to bring the heart closer to the chest wall for optimal imaging.
- ❖ If necessary, the participant was asked to slightly turn onto his left side to allow better access to the heart.
- ❖ The chest area was exposed, ensuring that the area where the transducer was placed is fully visible.
- ❖ A thin layer of ultrasound gel was applied to the participant's chest. This gel serves as a medium for sound wave transmission and helps eliminate air pockets between the skin and the ultrasound probe. The gel also helps improve the quality of the images by facilitating better sound wave penetration into the body.
- ❖ After the participant was comfortable, we asked him to hold his breath when required for clear imaging.
- ❖ An echocardiography machine was used with a phased-array transducer (5 MHz) to acquire clear images of the ascending aorta
- ❖ B-mode (Brightness Mode) Imaging was used to generate cross-sectional images of the heart's structures, including the aorta. The B-mode displays tissue interfaces and is essential for measuring the dimension of the ascending aorta.

The statistical analysis used SPSS-26. To analyze the numeric variables with normal distribution between groups the student's t-test was utilized while the Mann–Whitney test served for variable comparison when distribution was not normal. Statistical analysis of categorical differences occurred using the Pearson's Chi-square test (χ^2). The Pearson correlation analysis calculated statistical relationships between two numeric variables by producing correlation coefficient (r) outcomes which indicated direct positive or inverse negative statistical strength. The correlation levels wherein less than 0.3 factors no relationship and the range of 0.3 to 0.5 represented weak correlation and 0.5 to 0.7 marked moderate correlation and over 0.7

indicated strong correlation. Statistical significance when p value reached below 0.05.

RESULTS

No statistically significant differences between study groups in age, gender, and BMI. The comparison of aortic measurements between the two groups revealed that the study patients had significantly higher SBP (154.9 mmHg vs 115.4 mmHg, P=0.001), higher DBP (96.63 mmHg vs 76.61 mmHg, P=0.001), larger systolic diameter (34.89 mm vs 29.21mm, P=0.001) and larger diastolic diameter (33.02 mm vs 28.45 mm, P=0.001) than the controls. Further, the aortic wall thickness was significantly larger in the cases compared to the controls (4.06 mm vs 2.40 mm, P=0.001). On the other hand, the heart rate was not significantly different between the two studied groups (P≥0.05) [Table 1].

The Pearson correlation analysis showed a significant, positive correlation between aortic wall thickness and SBP (r=0.609, P= 0.001), DBP (r= 0.611, P=0.001), systolic diameter (r=0.365, P=0.009), and diastolic diameter (r=0.598, P=0.001) while it was not significantly correlated with BMI and heart rate. Further, no significant correlation was detected between BMI and each systolic and diastolic diameter (Table 2).

Figure No. 1: Echocardiography device

Table No.1: Comparison between study groups by certain parameters

Characteristics	Case (n= 50)	Control (n= 50)	P value
Age (Year)	44.21±8.7	46.49±1.3	0.412
Male	29 (58%)	35 (70%)	0.211
BMI (kg/m^2)	27.32±4.2	26.55±6.1	0.412
SBP (mmHg)	154.9±11.87	115.4±10.73	0.001
DBP (mmHg)	96.93±7.13	70.61±6.51	0.001
Heart rate (bpm)	79.2±12.96	75.43±11.82	0.131
Aortic systolic diameter (mm)	34.89±4.78	29.21±3.16	0.001
Aortic diastolic diameter (mm)	33.02±5.04	28.45±4.27	0.001
Aortic wall thickness (mm)	4.06±0.91	2.40±0.49	0.001
SBP (mmHg)	154.9±11.87	115.4±10.73	0.001

Table No.2: Correlations between aortic measurements

Aortic measurement	Aortic thickness (mm)		BMI (kg/m^2)	
	Correlation (r)	P - Value	Correlation (r)	P - Value
BMI (kg/m^2)	0.046	0.653	-	-
Aortic systolic diameter (mm)	0.365	0.009	0.093	0.231
Aortic diastolic diameter (mm)	0.598	0.001	0.137	0.098
SBP (mmHg)	0.609	0.001	-	-
DBP (mmHg)	0.611	0.001	-	-
Heart rate (bpm)	0.192	0.344	-	-

DISCUSSION

The diameter of the aorta enlarges progressively as life progresses while adapting to increased cardiac output during childhood development until pathological obesity in adulthood leads to further growth. Different diseases that damage blood vessels become usable through combined structural and functional assessments in standard clinical procedures.[15]

Both blood pressure numbers and measurements of aortic diameter and wall thickness stood at higher levels in study patients than in control subjects. The results match those discovered by Li et al[16] through their research which found both systolic and diastolic blood pressure measurement variability necessary to detect early coronary artery disease. Liu et al[17] determined that arteriosclerosis exists as an independent factor which affects blood pressure control in hypertensive patients for both systolic and diastolic measurements. Brandts et al[18] discovered that both elevated blood pressure and aortic wall thickness showed marked connections especially within the hypertensive population. According to Iwata et al[19], high systolic blood pressure values specifically linked to complex plaques forming in the aortic arch areas of patients with severe arterial narrowing.

Numerous studies have shown that CAD and CVD are associated with thicker artery walls. Plaque build-up and CAD can thicken artery walls, which when paired with changes in blood pressure can cause stiffness to gradually grow. Although aortic stiffness and greater artery wall thickness were linked to hypertension and higher DBP, respectively, no overt CVS symptoms were seen.[20,21] It is acknowledged that one of the main causes of elevated systolic and pulse pressure with aging is arterial stiffness, which also plays a significant role in myocardial infarction and stroke. Arterial stiffness has been linked to a variety of illnesses, such as ischemic heart disease and heart failure, in addition to aging and high blood pressure.[22]

Results of this research demonstrated that aortic wall thickness established positive relationships with systolic blood pressure (SBP), diastolic blood pressure (DBP), and systolic along with diastolic aortic diameters. This research showed that body mass index (BMI) and heart rate values failed to produce significant correlations. According to Ergul et al[23,] strong positive correlation relationship between left ventricular wall thickness and aortic diameter measurements as well as systolic and diastolic diameters.

The advancement of arteriosclerosis during aging occurs due to different contributing factors. Structural arterial remodeling cause's thickness increases in the intima-media layer throughout the aging process. As individuals age the vascular media shows mechanical property alterations that include harmful deposits of collagen fibers. Pulse wave velocity shows an intense connection to increasing patient age regardless of whether they have coronary artery disease because this vascular condition persists during advanced years when coronary artery disease is not present. Long-term exposure to vascular risk factors particularly diabetes mellitus plays a major role in causing age-dependent increases in arterial stiffness.[24]

It is recommending routinely assessment of aortic stiffness in high-risk populations, such as individuals with hypertension, diabetes, or a family history of cardiovascular diseases. Echocardiography could be employed as a cost-effective and non-invasive screening tool. Further larger longitudinal studies with larger sample size are needed to confirm the temporal relationship between aortic stiffness and the development of CAD. Enhanced imaging techniques and standardized protocols for assessing aortic stiffness should be developed to increase the clinical utility of this tool. A general idea about physicians' knowledge and attitude toward patient were confidentiality.

CONCLUSION

Aortic stiffness may serve as an early indicator or predictor for CAD in individuals, particularly in high-risk populations. Echocardiography has proven to be an effective tool in diagnosing the presence of aortic stiffness despite its failure to evaluate the severity of the lesion. The ability of echocardiography to evaluate aortic stiffness parameters, such as aortic diameter, reinforces its potential in clinical settings for early detection and risk stratification of CAD. Assessing aortic stiffness may allow for earlier intervention and prevention strategies for individuals at high risk of CAD. By monitoring aortic stiffness, clinicians could identify those at increased risk before significant coronary damage occurs, facilitating timely therapeutic interventions such as lifestyle changes or pharmacologic treatment.

Author's Contribution:

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Drafting or Revising Critically:	Ghazi Farhan Haji
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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Original Article

Assessment of Serum Interleukin 6 in Atopic Dermatitis Paediatric Patients in Najaf Province

Eshraq Haider Hussain Albalaghy and Fouad Shareef Dleikh

ABSTRACT

Objective: To investigate IL-6 levels in pediatric patients with atopic dermatitis based on their feeding methods.
Study Design: Cross-sectional study
Place and Duration of Study: This study was conducted at the Al-Ashraf Hospital, Al-Najaf from 1st October 2024 and 1st January 2025.
Methods: Sixty pediatric patients (aged 3months –13 years) of both genders were included and divided into two groups: 30 breastfed and 30 bottle-fed children were enrolled. IL-6 levels were measured, along with immunological markers (IgA, IgE) and hematological parameters.
Results: IL-6 levels were higher in bottle-fed children (median = 2.8, IQR = 3.9) compared to breastfed children (median = 1.9, IQR = 2.2); however, this difference was not statistically significant (p = 0.4). Sociodemographic factors showed no significant associations in either group. In the correlation analysis, a significant negative correlation was found between IL-6 and platelet count among breastfed children (r = -0.373, p = 0.042), while in bottle-fed children, IL-6 was negatively correlated with mean platelet volume (MPV) (r = -0.366, p = 0.047).
Conclusion: IL-6 levels tend to be elevated in pediatric patients with atopic dermatitis, particularly among those who are bottle-fed. Additionally, IL-6 shows a negative correlation with platelet count and MPV, suggesting potential immunological and hematological implications based on feeding type.

Key Words: Interleukin-6 (IL-6), Atopic Dermatitis, Breastfeeding

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INTRODUCTION

Interlucin-6 (IL-6) is an important cytokin involved in immune control, especially in inflammatory reactions and acute phase reaction. It is produced by macrophages, T cells and fibroblasts in response to infection or tissue damage, which stimulates the liver to produce acute phase proteins such as C-reactive protein (CRP). In addition, IL-6 Th17 supports immunity by promoting cell discrimination and activating B cells.[1]

IL-6 has also been shown to increase fibroblast proliferation and encourage migration and spread of keratinocytes. It shows a wide range of biological activities, including cell growth, cytotoxic T-cell discrimination and spread and discrimination of different cell types. In addition, IL-6 promotes the formation of hematopoetic stem cells through synergistic action with 3 IL-3, G-CSF and GM-CSF.[2]

IL-6 has a protective role of in the skin physiology. It has been shown to heal wounds and support skin regeneration and repair under the state of wounds and inflammatory skin conditions.[3] Despite these beneficial effects, the overproduction of IL-6 is associated with many pathological conditions, including multiple myeloma and autoimmune diseases such as rheumatic and systemic lupus erythematosus. Targeted treatment, such as Tocilizumab, is used to block the elevated IL -6 levels due to immunity and their role in chronic inflammation.

In the context of atopic dermatitis (AD), IL-6 contributes to chronic inflammation by promoting the development of Th17 cells and activating keratinocytes, leading to sustained skin irritation and itching. Its over expression enhances T helper cell responses and acute-phase protein synthesis, worsening the severity of the disease. This pro-inflammatory environment promotes disease progression by maintaining inflammation and impairing the epidermal barrier.

The role of breastfeeding in preventing allergic diseases remains inconclusive, potentially due to individual differences in the composition of breast milk. IL-6 has been detected in the majority of both colostrum and mature milk samples, whereas other cytokines are less frequently observed. A positive correlation has been found between levels of IL-6, IL-10, and transforming

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growth factor-β-cytokines involved in IgA production and total IgA concentrations in colostrums.[4]

Based on this background, the present study was designed to measure serum IL-6 levels in patients with atopic dermatitis and to investigate whether the type of early feeding is associated with differences in IL-6 expression.

METHODS

This cross-sectional study included a total sample of 60 paediatric patients diagnosed with atopic dermatitis (AD). The participants were divided into two groups based on their type of infant feeding: 30 patients who were breastfed and 30 patients who were bottle-fed. This was conducted between Al-Ashraf Hospital, Al-Najaf, Iraq from 1st October 2024 and 1st January 2025. All patients (36 males and 24 females) were clinically diagnosed with AD by a certified dermatologist, based on established clinical signs and symptoms.

Participants were categorised according to their early feeding history, as either exclusively breastfed or exclusively bottle-fed during infancy. Sociodemographic and personal information was collected through structured face-to-face interviews with patient's parents. Patients included in the study were between the ages of 3 months and 13 years, newly diagnosed with AD, and had no prior history of immunosuppressive therapy. Only patients with a clear history of exclusive breastfeeding or bottle feeding during the first six months of life were considered.

Patients were excluded if they had any other dermatological or systemic conditions, recent infections, or a history of mixed feeding. Each participant had 4-5 ml of blood drawn via vein puncture using disposable plastic 5 ml syringes. The sample was then allowed to clot at room temperature in clot activator gel tubes before being centrifuged for 15 minutes at about 5000 rpm to obtain serum free of unhemolyzed cells. Following that, the samples were labelled with the time of collection, gender, and reference code. Before the IL-6 measurement using standard curve, sera were frozen and kept at -20°C. The amounts in the patients' serum were measured using an ELISA kit in (Humaredre HS) washer for ELISA. The data was entered and analyzed through SPSS-25.

RESULTS

Statistical analysis showed that IL-6 levels were higher in bottle-fed children (median = 2.8, IQR = 3.9) compared to breastfed children (median = 1.9, IQR = 2.2), although the difference was not statistically significant (p=0.4) [Table 1, Fig. 1]. No statistically significant differences in IL-6 levels were observed between feeding groups across sociodemographic variables (p > 0.05) [Table 2].

Correlation analysis among breastfed children showed a significant negative correlation between IL-6 and platelet count (r = -0.373, p = 0.042). Among bottle-fed children, a significant negative correlation was found between IL-6 and MPV (r = -0.366, p = 0.047) [Tables 3-, Figs. 2-3).

Table No.1: Comparison of IL-6 level between breast fed and bottle fed children

	Breast feeding (Median IQR)	Bottle feeding (Median IQR)	P value
IL-6	1.9 (2.2)	2.8 (3.9)	0.4

Table No.2: Comparison of sociodemographics with feeding

Variable	Breast feeding (Mean±SD)	Bottle feeding (Mean±SD)	P value
Gender			
Male	1.7±2.2	2.8±4.4	0.4
Female	2.0±6.5	3.0±3.7)	0.9
Age (years)			
0-3	3.1±2.1	3±3.1	0.9
4-6	1.6±4.8	3.4±3.8	0.4
7-10	2.0±7.0	2.0±2.9	0.6
11-13	1.5±2.9	2.7±5.1	0.4
Nutritional status			
Normal	2.1±4.1	2.7±3.1	0.7
Underweight	1.2±0.4	-	-
Overweight	1.3±0.6	3.9±5.0	0.5

Table No.3: Correlation of IL-6 with IgA, IgE and hematological variables among breastfed children (n=30)

Variable	Pearson Correlation (r)	P value
IgA	-0.080	0.673
IgE	0.220	0.243
WBC	0.114	0.550
HB	-0.046	0.810
Platelets	-0.373	0.042
MPV	0.156	0.411
Neutrophil	-0.043	0.8

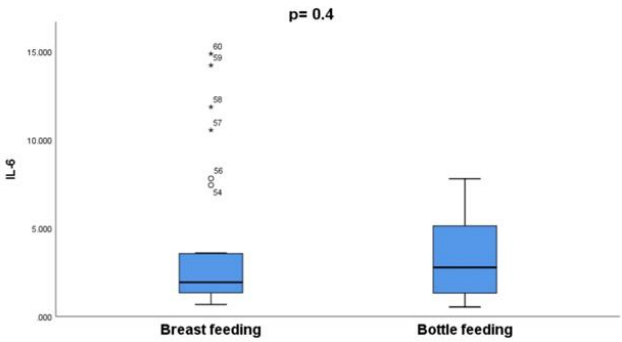

Figure No. 1: Types of feeding

Table No.4: Correlation of IL-6 with IgA, IgE and hematological variables among bottle-fed children (n=30)

Variable	Pearson Correlation (r)	P value
IgA	-0.175	0.354
IgE	-0.146	0.442

WBC	0.130	0.493
HB	0.085	0.657
Platelets	0.131	0.49
MPV	-0.366	0.047
Neutrophil	0.160	0.397

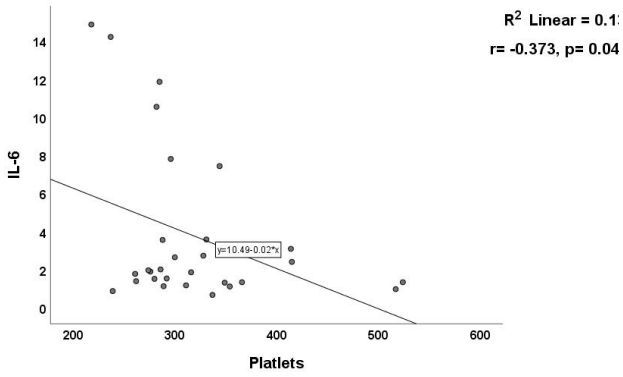

Figure No. 2: Correlation of platelets and IL-6 among breastfed children (n=30)

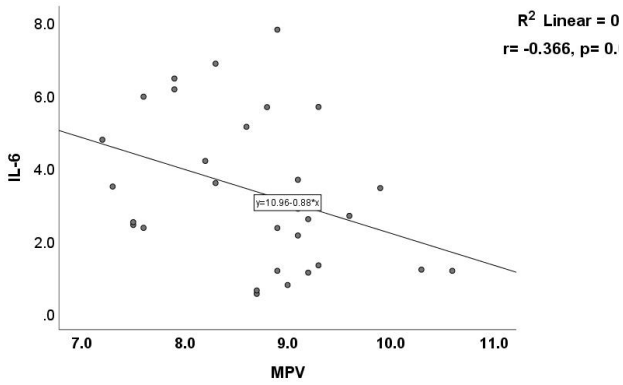

Figure No. 3: correlation of MPV and IL-6 among bottle-fed children (n=30)

DISCUSSION

The role of interleukin 6 (IL-6) in atopic dermatitis (AD) and allergic inflammation is multifaceted, with emerging evidence indicating its involvement in both the immune response and disease progression. Previous studies suggest that T cells in AD patients produce elevated levels of IL-6, which contributes to inflammation and the pathophysiology of atopic disorders.[5] In peripheral blood, monocytes are considered the primary source of IL-6, which emphasizes the importance of this cytokine in immunity of allergic diseases.

Although the exact function of IL-6 in AD is unclear, it is released as part of the skin's allergic reaction in atopic individuals, playing an important role in excessive production with dendritic cells.[6] IL-6 is an important cytokin for maintaining homeostasis, produced in response to rapid infection or tissue damage. Production triggers acute phase reactions and controls immunity, which is important to protect against external stresses. However, when IL-6 is overproduced and continuously performed, it contributes to pathological conditions such as systemic inflammatory response syndrome.[7] It highlights the double role of IL-6 both as a protective agent and potential intermediary of the disease when dysregulation is complete.

When it comes to AD, the level of elevated IL -6 is strongly associated with the severity of the disease. The level of high serum IL-6 is often found in patients with more severe AD patients than people with mild or moderate forms of the disease, making IL-6 a potential biomarker to assess the severity of the disease.[6] Interestingly, IL-6 TH2 plays a regulatory role in allergic diseases by preventing discrimination of T cells in cells, which are heavily associated with allergic reactions, including asthma. In situations in which IL-6 signalling is weakened, for example in hyper-IGE syndrome, T cells are more likely to distinguish in TH2 cells, which contributes to allergies development. This new discovery shows that IL-6 may be involved in not only promoting inflammation, but also to prevent excessive immune activation by regulating Th2 cell development.

In addition, IL-6 is present in both colostrum and mature breast milk, where it is associated with other cytokines, such as IL-10 and transforms growth factor-oil (TGF-ß), which plays an important role in immune control and in the synthesis of immunoglobulin A (IGA). This suggests that IL-6 may also play an important role in early immune reactions, potentially affects the development of the immune system in newborns.[4] The results of this study highlight a complex relationship between interleukin -6 (IL -6) levels, platelet numbers and mean platelet volume (MPV) in cases of atopic dermatitis (AD).

It was observed that the number of platelets was higher in AD patients than healthy controls, but no significant differences were found in MPV values between patients and control groups. The discovery corresponds to previous studies, which had no significant impact on MPV values.[8]

It is well established that platelets play an important role in allergy inflammation, which shows changes in platelet activation, volume and allergic status in quantity and MPV values.[9] In this study, the MPV value for AD patients was equal to the control group, which suggested that other factors may affect MPV values in addition to the disease.

On the other hand, the study on conditions such as chronic atopic dermatitis and asthma has reported changes in MPV associated with immune responses, with some studies, Urticaria shows less MPV values in patients.[10,11] This variability may be caused by various immune responses in various allergic diseases.

In the case of the negative correlation between IL-6 and platelets, the results of this study indicate that high IL-6 levels are associated with changes platelet numbers and

reduction in MPV. This suggests that the elevated IL-6 during inflammation can induce platelet changes, and supports the idea that platelet activation plays an important role in inflammatory diseases such as atopic dermatitis.[12,13]

CONCLUSION

IL-6 is an important cytokine that contributes to the development and course of atopic dermatitis and is important for immunological control. Its complex significance in allergic disorders is exposed by its double role in the induction of inflammation and regulation of the TH2 cell development. Future treatment methods that target IL-6 signalling can be made possible as a biomarker for the severity of the disease in the capacity of IL-6 and its regulatory roles in inflammation of allergies, which provide significant insight into the pathophysiology of atopic dermatitis.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Eshraq Haider Hussain Albalaghy, Fouad Shareef Dleikh
Drafting or Revising Critically:	Eshraq Haider Hussain Albalaghy, Fouad Shareef Dleikh
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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Original Article

Institutional and Managerial Barriers in Pandemic Nursing: Examining the Impact of Resource Insufficiency and Workload on Healthcare Professionals in Al–Haweja Hospital

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ABSTRACT

Objective: To investigate the institutional and managerial barriers encountered by healthcare professionals at Al-Haweja Hospital during the COVID-19 pandemic, with a particular focus on the impact of resource insufficiency and workload on nursing staff.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Community Nursing Department, College of Nursing, University of Babylon, Iraq from 15th July 2024 to 1st December 2024.

Methods: This cross-sectional study was conducted during above period and 100 nurses workers Al –Haweja Hospital, Iraq regarding to their socio-demographic characteristics, work-related experiences, and perceptions of institutional challenges were enrolled.

Results: The significant shortages in personal protective equipment, inadequate training programs, overwhelming workloads, and insufficient administrative support, which collectively contributed to heightened stress, anxiety, and burnout among the nursing staff. Additionally, socio-demographic factors were no significant relationships found between these variables and nurses' responses to institutional and managerial challenges, especially a p-values for these comparisons were all greater than 0.05.

Conclusion: The importance of addressing these barriers through enhanced support systems, better training, and more effective organizational policies to ensure the resilience of healthcare workers during pandemics.

Key Words: Pandemic Nursing, Institutional Barriers, Managerial Challenges, Workload

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INTRODUCTION

An epidemic refers to the rapid spread of an infectious disease, dramatically raising the risk of morbidity and mortality across a vast geographical region. It has posed unprecedented challenges to healthcare systems worldwide, placing immense pressure on frontline healthcare workers.[1] The severity of an epidemic is typically substantial, as it affects a large portion of the population, often due to the absence of immunity to the pathogen. Epidemics, particularly those caused by viruses, can have profound effects on society.[2,3]

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Among these challenges, institutional and managerial barriers have emerged as critical factors hindering the optimal functioning of healthcare facilities. These barriers often exacerbated by resource insufficiency and overwhelming workloads, have had a profound impact on the ability of healthcare professionals to deliver quality care. In particular, the experience of nursing staff during the pandemic has underscored the vulnerabilities within healthcare systems, including inadequate resources, inefficient management practices, and the lack of adequate support structures.[4] Healthcare institutions and their management have faced significant strain during the pandemic, leading to the need for prioritizing nursing interventions amidst limited resources.[5]

Al-Haweja Hospital in Iraq, a key healthcare facility serving a diverse population, is no exception situated in a region that has experienced substantial strain on healthcare resources due to the pandemic, the hospital's nursing staff has faced significant institutional and managerial barriers that have impacted their performance and well-being.[6] The shortage of medical supplies, insufficient staffing, and lack of proper managerial support have amplified the challenges faced by nurses, further exacerbating their already heavy

workload.[7] One significant challenge has been assigning staff to care for infected patients, particularly professional nurses, who are crucial to providing quality patient care.[8] As an example, nurses during the COVID-19 pandemic faced one of the most formidable challenges in history, working on the front lines to reduce disease transmission while exposing themselves to health risks through direct contact with infected patients and managing a significantly higher workload.[9] Thus, understanding the specific barriers within this context is crucial for developing strategies that can enhance healthcare delivery and improve the work environment for healthcare professionals, especially during times of crisis.

This study seeks to examine the impact of institutional and managerial barriers on pandemic nursing, focusing specifically on the effect of resource insufficiency and workload on healthcare professionals at Al-Haweja Hospital. In exploring these factors, the study will provide valuable insights into the broader challenges faced by healthcare institutions during pandemics and offer evidence-based recommendations for policy changes and managerial improvements. This is the first study in Iraq to examine the challenges faced by medical institutions and their management during the pandemic, focusing on the impact of resource shortages and heavy workloads on nurses.

METHODS

A descriptive cross-sectional study was conducted from 15th July 2024 to 1st December 2024 at Al-Hawija General Hospital. This hospital, like others in Kirkuk governorate, provides a variety of services such as pediatrics, medical and surgical care, orthopedics, burns treatment, maternal health services, a laboratory, and other diagnostic and therapeutic services. A total 100 nurses were selected from different departments and had a minimum of two years of experience in nursing services.

The study was conducted using the following steps: a questionnaire was developed by the researcher after reviewing relevant literature on nurses' experiences with pandemic-related phenomena. Data was collected through interviews, each lasting between 20 to 30 minutes, during which nurses answered all the questions in the questionnaire. The questionnaire consisted of three main sections: **Part one:** Demographic data, including general characteristics such as gender, age, marital status, number of children, residence, and economic status. **Part two: N**urses characteristics, such as educational qualifications, years of experience, length of time working in pandemic wards, participation in training courses about pandemic diseases, infection during the COVID-19 pandemic, and whether the nurse had a private clinic during the pandemic. **Part three:** Challenges faced by nurses during the pandemic, covering 41 items related to nurses' experiences. This section also included the Institutional and Managerial Challenges Dimension, which contained 10 items.

The items were rated using a three-point Likert scale: extremely satisfied, satisfied, and unsatisfied. The corresponding scores were 3 for "extremely satisfied," 2 for "satisfied," and 1 for "unsatisfied." The researcher divided the scale into three levels for analysis.

To ensure the validity of the instrument, the researcher used content validity, ensuring that the items accurately represented the study's content. A panel of 16 specialists from various fields, including nursing (community and psychiatric) and medicine, reviewed the questionnaire. Their feedback, comments, and suggestions were incorporated into the final version.

The reliability of the questionnaire was assessed using Cronbach’s alpha, a statistical method used to measure consistency and dependability in the data collection tool. The table below formed statistically to display the Cronbach's Alpha of the coefficient of reliability for the items of research instrument scales (Table 1). Data analysis was carried out using SPSS version 26. To compare continuous data across groups, t-tests or ANOVA were applied, while Chi-square tests were used for categorical data and a significance level of $p<0.05$.

RESULTS

When asked about their duration of work in the pandemic wards, 51% had worked in these wards for 1 to 5 years. Furthermore, 63% of the nurses had participated in a training program about pandemic diseases, and 60% reported having been exposed to infection. Finally, 26% of the participants owned a nursing clinic during the pandemic (Table 2).

Table 3 outlines the responses of nurses to various institutional and managerial challenges they faced during the pandemic. Each item is evaluated based on how strongly nurses agree or disagree with the statement, with the corresponding percentage and mean scores provided. The highest mean score was 2.38 and the lowest mean score was 1.92 (Fig. 1).

Table 4 presents the relationship between the socio-demographic characteristics of the participants and their overall responses to experiences related to pandemic phenomena, specifically focusing on institutional and managerial challenges. The analysis used the Chi-square test to assess associations. The results show that marital status was significantly related to responses about pandemic-related challenges ($p < 0.05$), while age, sex, number of children, residence, economic situation, and academic achievement did not show significant associations ($p > 0.05$).

Table 5 examines the relationship between work-related data and participants' experiences regarding institutional and managerial challenges during the pandemic. The Chi-square test revealed no significant

relationships between any of the work-related factors such as years of service, duration of working in the ward, pandemic disease training, exposure to infection, or owning a nursing clinic and the responses to the challenges ($p > 0.05$).

Table No.1: Alpha Cronbach of study instrument's items

Variables	Items	Alpha Cronbach	Assess-ment	Standard
Managerial	10	0.7231	Accept-able	0.70
Total	41	0.821	Accept-able	0.70

Table No.2: Socio demographical data of nurses dealing with pandemic phenomena (n=100)

Socio demographics	No.	%
Age (years)		
20-29	52	52.0
30-39	36	36.0
40-49	12	12.0
Gender		
Male	60	60.0
Female	40	40.0
Marital status		
Single	36	36.0
Married	55	55.0
Divorced	4	4.0
Widow	5	5.0
Number of children		
0	53	53.0
1-2	16	16.0
3+	31	61.0
Residence		
Urban	47	47.0
Rural	53	53.0
Economic status		
Satisfied	35	35.0
Good	49	49.0
Not good	16	16.0
Academic achievement		
Diploma	59	59.0
Bachelor	41	41.0
Years of service		
1-5	61	61.0
6-10	19	19.0
11-15	11	11.0
16-20	9	9.0
Duration of working in ward		
1-5	51	51.0
6-10	31	31.0
11-15	14	14.0
16 and more	4	4.0
Training program about pandemic disease		
Yes	63	63.0
No	37	37.0
Exposure to infection		
Yes	60	60.0
No	40	40.0
Do you own a nursing clinic during the pandemic		
Yes	26	26.0
No	74	74.0

Table No.3: Distribution of responses of nurses regarding institutional and managerial challenges dimension

Variable		No.	%	Mean± SD
I think personal protective equipment is insufficient	Disagree	16	16.0	2.30±0.73
	Partially agree	38	38.0	
	Agree	46	46.0	
I think that the necessary equipment for patient care (respirator, patient bed, etc.) is insufficient	Disagree	4	4.0	2.38±0.56
	Partially agree	54	54.0	
	Agree	42	42.0	
I think that basic education courses (knowledge about the causes of the disease, protection/isolation measures, etc.) are insufficient	Disagree	19	19.0	2.19±0.73
	Partially agree	43	43.0	
	Agree	38	38.0	
I think that supportive training courses (coping with stress, communication management, etc.) are insufficient	Disagree	20	20.0	2.14±0.72
	Partially agree	46	46.0	
	Agree	34	34.0	
I think that working conditions have been aggravated in the pandemic	Disagree	16	16.0	2.24±0.71
	Partially agree	44	44.0	
	Agree	40	40.0	
I think that my workload has increased	Disagree	20	20.0	2.19±0.74
	Partially agree	41	41.0	
	Agree	39	39.0	
I think that administrative support is insufficient	Disagree	25	25.0	2.07±0.75
	Partially agree	43	43.0	
	Agree	32	32.0	
I think that work lists are not made fairly	Disagree	24	24.0	1.97±0.67
	Partially agree	55	55.0	
	Agree	21	21.0	
I think that working hours are not planned effectively	Disagree	26	26.0	2.05±0.75
	Partially agree	43	43.0	
	Agree	31	31.0	
I think that the flow of information is not transparent	Disagree	35	35.0	1.92±0.78
	Partially agree	38	38.0	
	Agree	27	27.0	

Table No.4: Relationship between the demographic characteristics and overall responses of the participants about experiences related to pandemic phenomena

Variable		Institutional and managerial challenges
Age	X^2	.228
	Sig.	N.S

Sex	X^2	.227
	Sig.	N.S
Marital status	X^2	.034
	Sig.	Sig.
Number of children	X^2	.073
	Sig.	N.S
Residence	X^2	.650
	Sig.	N.S
Economic situation	X^2	.602
	Sig.	N.S
Academic achievement	X^2	.595
	Sig.	N.S

N.S = No significant, Sig= Significant, P-value=0.05.

Table No.5: Relationship between the work related data with and overall responses of the sample about experiences related to pandemic phenomena.

Work related data		Institutional and managerial challenges
Years of service	X^2	.286
	Sig.	N.S
Duration of working in ward	X^2	.192
	Sig.	N.S
Training program about pandemic disease	X^2	.090
	Sig.	N.S
Exposure to infection	X^2	.407
	Sig.	N.S
Do you own a nursing clinic during the pandemic	X^2	.252
	Sig.	N.S

N.S = no significant, Sig= significant, p-value=0.05.

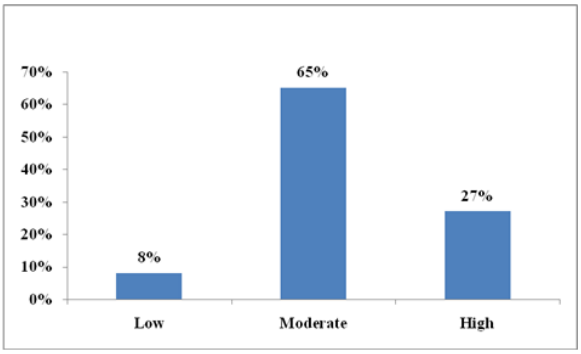

Figure No. 1: Overall mean responses of nurses regarding institutional and managerial challenges dimension
Cutoff point: Low=(1-1.66), Moderate=(1.67-2.33), High=(2.34-3)

DISCUSSION

The findings reflect significant institutional and managerial challenges encountered by nurses during the pandemic. One of the most pressing issues identified was the insufficiency of Personal Protective Equipment (PPE), which was widely recognized as a critical challenge. The majority of nurses in our study agreed that the available PPE was inadequate, highlighting a major concern regarding the protection of frontline healthcare workers. This aligns with the findings who reported that PPE shortages were a global issue during the pandemic, particularly in low-resource settings.[10] Their study also emphasized that the lack of proper PPE not only exposed healthcare workers to higher risks but also caused increased stress and anxiety, which were commonly reported by nurses in our study as well.

In addition, our study found a general agreement among nurses that working conditions, workloads, basic education courses, supportive training, and administrative support were insufficient. These findings are consistent with research[11] who also identified that inadequate training, overwhelming workloads, and lack of administrative support were pervasive issues faced by nurses globally during the COVID-19 pandemic. Specifically, Gómez-Ochoa et al[11] noted that nurses in their study reported increased stress levels due to high patient loads and the insufficient administrative response to the rapidly evolving situation. Similarly, our study found that nurses expressed the need for more supportive training in areas such as stress management and communication, which were essential for coping with the added pressures of the pandemic.

Moreover, the gap in basic educational programs, particularly on disease causes and protective measures, was another area highlighted in our research. This is similar to findings[12] who reported that many healthcare workers, especially in developing countries, lacked adequate training regarding COVID-19 protocols, further exacerbating the challenges they faced. In our study, 81% of nurses felt that basic educational courses were insufficient, underscoring the need for comprehensive and continuous professional development programs for nurses in future public health emergencies. Taken together, these findings highlight the pressing need for improvement in several key areas, including the provision of adequate PPE, better working conditions, effective workload management, and more robust training and administrative support. These deficiencies is crucial for ensuring the well-being of nurses and improving the overall quality of care during critical times.[11,13]

The relationship between socio-demographic characteristics and the overall responses of participants regarding their experiences related to the pandemic phenomena, specifically focusing on institutional and managerial challenges. Our analysis reveals several interesting findings, the results of the Chi-square test for age (X^2=0.228, p>0.05), residence (X^2=0.650, p>0.05), economic situation (X^2=0.602, p>0.05), and academic achievement (X^2=0.595, p>0.05) indicate that there is no significant relationship between them of the participants and their responses regarding institutional and managerial challenges during the pandemic. This finding is consistent with the previous studies[13,14], which reported that age, residence, and level of education did not significantly influence how healthcare workers experienced or responded to challenges during the pandemic crises. Regarding the gender, the Chi-

square test for gender (X^2=0.227, p>0.05) shows that there is no significant relationship between the gender of the participants and their experiences of institutional and managerial challenges. This is in line with the findings who found no substantial gender-based differences in how nurses experienced the pandemic's impact in Middle Eastern and South Asian countries.[10]

Our results found that there is not significant, meaning that the number of years a respondent has worked does not appear to influence their perception of institutional and managerial challenges during the pandemic. Many studies highlight that experience can shape one's ability to cope with crises (e.g., a higher number of years of service might offer greater resilience or understanding of institutional dynamics.[15,16] In addition, our results found no significant relationship between receiving training for pandemic diseases and the reported institutional and managerial challenges. On the other hand, several studies emphasize the importance of training programs, suggesting that well-prepared workers tend to navigate crises more effectively.[17] This result contradicts such findings, possibly due to the limited scope or quality of the training programs provided in this study's sample.

This study is subject to several limitations. Firstly, the sample size may not have been sufficiently large to identify significant relationships between variables. Additionally, the concept of "institutional and managerial challenges" may not have been fully captured in the study's operationalization, potentially overlooking some key aspects of the challenges respondents experienced. Moreover, there may be unaccounted variables, such as the availability of resources, organizational culture, and external policy responses, which could have played a more pivotal role in influencing workers' perceptions.

CONCLUSION

The findings highlight several critical areas for improvement in pandemic preparedness and response, including better PPE provision, improved training programs, and more effective administrative support. Future studies should explore the impact of organizational support, mental health interventions, and public health policies on healthcare workers' experiences during pandemics. Longitudinal research would also be valuable to assess the long-term impacts of these challenges on the nursing workforce, ensuring better preparedness for future health crises.

Author's Contribution:

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Drafting or Revising Critically:	Fadhel Abbas Ahmed**,** Salma K. Jihad
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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