Volume:7, Issue:1
Jan - Jun 2025

ISSN (Print): 2312-6531
ISSN (Online): 2958-5511

Foundation University Medical Journal

Recognized by:
Higher Education Commission, Pakistan (HEC)
Pakistan Medical and Dental Council (PM&DC)

Foundation University Islamabad,
Defence Avenue, DHA Phase-I,
Islamabad 44000, Pakistan.
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Foundation University Medical Journal

Vol. 7, No. 1, Jan - Jun 2025
ISSN Print: 2312-6531
ISSN Online: 2958-5511

For electronic submission of articles (OJS)/ Online Issue:
fumj.fui.edu.pk

Email address for correspondence:
fumj@fui.edu.pk

Publication Office: Department of Pharmacology, Foundation University Medical College, DHA Phase - I, Islamabad, Pakistan 46000

FOUNDATION UNIVERSITY MEDICAL JOURNAL

Vol-7, No.1, Jan-Jun 2025

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EDITORIAL

DO WE NEGLECT PATIENTS?

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When a patient walks into a consultant's room, he/she has a specific symptom/set of symptoms to tell the physician, based on which the story kicks off; differentials are considered, certain tests are ordered, and a treatment/management plan is devised. In due course of time, the whole scenario becomes monotonous, mechanical, and robotic. Something gets forgotten in this process- the patient himself, as an entity, a living being, an individual possessing a body, mind, emotions, fears, and anxieties. The human mind is so complex, layer upon layer that a mere one to two minutes fails to make evident what is going on within him.

The question arises "Do we neglect patients"?

The critics of the medical profession, who every now and then come up with a scandalous piece of information, may be dismissed as ill-informed or biased, yet patient neglect is an issue of increasing public concern from around the globe. The WHO has recognized deficiencies in patient safety as a global healthcare issue that needs to be addressed. Medical negligence is an act or omission by a health care provider, where the care provided deviates from accepted standards of practice and causes injury or death to the patient.[1] It is due to such errors that patient deaths in the US range between 44,000 to 98,000 per year.[2] The WHO report says that around 1 in every 10 patients is "harmed" in health care and more than 3 million deaths occur annually due to unsafe care. This happens in the developed world as well as in resource-constrained countries like ours.[3] Further elaborating, the report informs us that above 50% of harm (1 in every 20 patients) is preventable; half of this is attributed to medications.[1,3]

"First, do no harm" is the most fundamental principle of any health care service. No one should be harmed in a health care facility;[4] however, the available evidence points to a huge burden of avoidable patient harm across the developed and developing world health care systems. This has major ethical and financial implications.

Whose responsibility is patient safety and prevention of patient harm, then?

Patient neglect is an issue of increasing public concern worldwide despite the technological advancement of healthcare systems. It is difficult to measure in specific terms or in clinical outcomes due to the complex nature of interactions involved in the whole process. The responsibility for this neglect is equally shared by the practitioners, the healthcare staff, the institution, the government, and the patient.

Institutional factors contributing to patient neglect include the work environment (enabling or otherwise), resources, management, and leadership.

At the individual level, high workloads, stress, and poor work environment create demotivation in the staff, who resultantly are unable to perform to their full ability to provide optimal care.[4]

One of the most important aspects of the failure of health care is at the governmental level; governments in underdeveloped regions have not made health a priority. The process of neglect that starts at the primary healthcare level eventually leads to the overburdening of the tertiary care system. The part the government should play is to enhance its spending on healthcare, improve the infrastructure, and exercise control on the medical practices/curb rampant quackery; thereby ensuring patient safety.

And at our level...?

"Treat the whole patient, not just a particular disease" used to be the guiding principle for most clinicians. The medical fraternity is moving away from their core skill of history taking and general physical examination, which is indispensable. This time-tested, centuries-old tradition will have to be revived, and we know it already, nothing gives a better clue to the disease than a detailed interview of the patient, coupled with a good examination. The time thus invested is not wasted as we might think. In fact, it goes a long way in determining

appropriate treatment strategy, helping not only the patient but the physician as well, if only we give it a deep thought!

Understanding the physical and emotional needs of the patients can help in providing optimal care and thus improve outcomes. The patient-centered care approach helps in building trust between patients and their healthcare providers.[5] A holistic approach focuses on a person's wellness and not just the illness that drives proper decisions.

Although we do not have a true unbiased picture of the patient neglect in our population, it can be said with certainty that the situation must be worrisome!

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RESEARCH ARTICLE

OUTCOMES OF NASOLACRIMAL INTUBATION IN CHILDREN AGED 1 TO 8 YEARS

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ABSTRACT

Objective: *To evaluate the outcomes of nasolacrimal duct (NLD) intubation in children aged 1-8 years having congenital nasolacrimal duct obstruction (CNLDO) and to compare success rates among different age groups.*

Study design: *Retrospective-Observational study.*

Place and Duration of study: *Al-Shifa Trust Eye Hospital, Rawalpindi. March-October 2023.*

Patients and Methods: *A total of 187 eyes from 162 pediatric patients aged 1–8 years who underwent NLD intubation were included. After exclusions, 156 eyes were analyzed. Patients were categorized into three age groups: Group A (1.1 to <3 years), Group B (3 to <5 years) and Group C (5 to 8 years). Success was defined by both subjective (resolution of tearing and discharge) and objective criteria (negative regurgitation test). Statistical analysis was performed using SPSS (Version 23.0) and intergroup comparisons were made using the Chi-square test.*

Results: *The overall success rate of NLD intubation was 68.59% with younger children demonstrating higher success rates. Group A had the highest success rate (83.67%) followed by Group B (64.86%) and Group C (58.93%), with a statistically significant difference (p = 0.0385). Complications occurred in 25 cases; tube extrusion (7 patients), cheese wiring of the puncta (5 patients), mucocoele, nasolacrimal fistula, and chronic dacryocystitis (1 patient each).*

Conclusion: *This study highlights that nasolacrimal intubation is more effective in younger children. The findings suggest that early intubation might prevent the need for multiple surgeries and reduce complications.*

Keywords: *Congenital Nasolacrimal Duct Obstruction, Nasolacrimal Duct Intubation, Regurgitation Test*

INTRODUCTION

Congenital nasolacrimal duct obstruction (CNLDO) is a prevalent condition affecting the pediatric population, characterized by epiphora, mucopurulent discharge, and recurrent conjunctivitis due to obstruction of the nasolacrimal drainage system.[1] It occurs due to delayed involution of the Hasners membrane at the Hasner valve in distal end of the duct.[2] It occurs in approximately 20% of newborns and resolves spontaneously in 90% of cases within the first year of life.[3] However, the rate of spontaneous resolution drops beyond 1 year of age and persisting CNLDO is associated with chronic dacryocystitis, pre-septal and orbital cellulitis, anisometropia and amblyopia.[4]

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Received: 11 Mar 2025; revision received: 28 Mar 2025; accepted: 14 May 2025

Probing of the nasolacrimal duct is the primary treatment for persistent CNLDO after the first year of life. For older children, particularly those above 18 months of age, nasolacrimal duct intubation with silicone tubing has been increasingly utilized as either a primary or secondary intervention following failed probing.[5] Nasolacrimal intubation involves the insertion of a silicon tube through the lacrimal drainage system, providing a temporary stent to maintain duct patency and prevent restenosis.[6] This technique has been associated with higher success rates compared to repeated probing in older children as it mitigates the risk of inflammation and fibrosis which is associated with this age group and reduces the likelihood of requiring dacryocystorhinostomy.[7,8] Although nasolacrimal intubation is an invasive procedure, there are fewer associated complications. Tube extrusion and cheese wiring are among the most frequently encountered postoperative issues.[9] It is now increasingly used by

clinicians as a primary method in older children, in children having the procedure under general anesthesia, or when the duct feels tight during probing.[7] Jafarizadeh A et al reported outcomes of probing and nasolacrimal intubation in children over 18 months and found that out of 110 eyes, 13 (11.8 %) experienced failure while 97 (88.2 %) were censored.[5] Repka et al reported a success rate of 91% (95% confidence interval = 86% to 95%) for primary silicon intubation in 150 eyes of children aged less than 4 years of age.[6]

Despite the widespread adoption of nasolacrimal intubation, the impact of age on surgical outcomes remains a topic of debate and there is no defined optimal age for nasolacrimal intubation. There are few studies in the literature that reports the results of nasolacrimal intubation in children with a wider age range.[10,11] To the best of our knowledge, there is no study in the literature comparing success rates of primary intubation in different age groups. Furthermore, there is a paucity of local data of our population in this regard. This study aims to evaluate the outcomes of nasolacrimal duct intubation in children aged 1-8 years with CNLDO, assessing success rates across different age groups. By analyzing the efficacy of intubation in various pediatric age brackets, this study seeks to provide insights into optimal surgical management strategies and improve clinical decision-making in pediatric ophthalmology.

PATIENTS AND METHODS

This is a retrospective interventional cases series conducted at AlShifa Trust Eye Hospital, a tertiary care ophthalmology center, over a period of 8 months from 1st March 2023 till 31st October 2023. Ethical approval was obtained from the Ethical Review Committee. Informed consent was obtained from the legal guardians of all participants before surgery. Patient confidentiality was maintained throughout the study and no identifiable information was disclosed.

The study included pediatric patients aged 1-8 years who underwent nasolacrimal duct intubation due to persistent CNLDO. Inclusion criteria consisted of clinical diagnosis of CNLDO, and failure of conservative management, including lacrimal sac massage and topical antibiotics. Patients with secondary nasolacrimal duct obstructions due to trauma, congenital anomalies (e.g., craniofacial syndromes), or previous lacrimal surgeries were excluded. The diagnosis of CNLDO was clinical; based on the parents' complaints of persistent tearing or discharge and on examination, associated with increased tear lake, matting of eyelashes, and/ or positive regurgitation test (regurgitation of clear/ mucoid or pussy fluid on pressing the lacrimal sac). Slit lamp examination was done and other pathologies causing epiphora like conjunctivitis, glaucoma, eyelid abnormalities or ocular surface irritation were ruled out. Dilated fundus exam and cycloplegic refraction were done.

All intubation procedures were performed under general anesthesia by experienced pediatric ophthalmologists. The surgical protocol included initial lacrimal probing using Bowman probes to assess obstruction severity. Following the successful passage of the probe into the nasal cavity, a silicon bicanalicular stent was inserted and secured in place. The stent was left in situ for 2 to 12 months, based on surgeon preference and patient-specific factors. Postoperatively, all patients received topical antibiotics (e.g., moxifloxacin) and corticosteroid eye drops for a period ranging from 2 to 4 weeks followed by regular follow-up assessments. The study outcome examination was done 1 to 3 months from the date of tube removal. Treatment success labelled based on subjective (resolution of symptoms of tearing or discharge) and objective assessment i.e. absence of clinical signs of NLDO (epiphora, increased tear film, and mucous discharge). Patient demographic data, clinical presentation, surgical details, and postoperative outcomes were extracted from medical records. Children were grouped according to age as follows:

- Group A: 13 to 31.9 months (1.1 to <3years)
- Group B: 33 to 59.9 months (3 to <5 years)
- Group C: 60 to 84 months (5 to 8 years)

Data were analyzed using SPSS (Version 23.0, IBM Corp.), with categorical variables compared using the chi-square test and continuous variables assessed via independent t-tests. Logistic regression analysis was performed to evaluate the association between age and surgical success, with a significance level set at p-value < 0.05.

RESULTS

A total of 187 eyes from 162 patients underwent nasolacrimal duct (NLD) intubation. However, 17 cases were lost to follow-up and subsequently excluded. Additionally, four cases were deemed unsuitable for intubation due to anatomical anomalies, including absent puncta and canaliculi or severe punctal stenosis. Furthermore, five cases experienced spontaneous tube extrusion within two weeks of the procedure and were

also excluded. As a result, the final analysis comprised 156 eyes with 83 males (53.21%) and 73 females (46.79%). The mean age was 3.88 years.

The success rate of NLD intubation varied significantly across different age groups ($\chi^2 = 8.55$, $p = 0.0385$). The highest success rate was observed in children aged 1–2 years (Group A), with an overall success rate of 83.67%. Conversely, children aged 5–8 years (Group C) exhibited the lowest success rate at 58.93%. The success rates for each group were as follows:

- Group A (1–2 years): 83.67% success rate
- Group B (3–4 years): 63.04% success rate
- Group C (5–8 years): 58.93% success rate

Gender-specific analysis revealed a notable difference in success rates. Males in Group A had a significantly higher success rate (92.31%) compared to females (73.91%). Similarly, in Group B, females exhibited a success rate of 74.07%, whereas males had a lower success rate of 52.17%. In Group C, success rates remained comparable between genders, with males achieving a success rate of 57.58% and females 60.87%.

Independent t-test results have *p*-value less than 0.05, hence there is a statistically significant difference in age between the successful and unsuccessful groups. Logistic regression analysis revealed that age is significantly associated with surgical success ($p = 0.008$). The negative coefficient suggests that as age increases, the likelihood of success decreases. The model explains a small proportion of variability in success rates, implying other factors may influence outcomes.

In terms of complications, 25 cases (16.03%) experienced adverse outcomes. The most common complication was tube extrusion, reported in seven cases. Additionally, five patients exhibited cheese wiring of the puncta. Other complications included mucocoele formation, nasolacrimal fistula, and chronic dacryocystitis, with one patient each.

Table I: Independent t-test Results

Variable	Success (Mean ± SD)	Failure (Mean ± SD)	t(154)	*p*-value	95% CI (Lower, Upper)
Age (years)	3.57 ± 1.52	4.52 ± 1.68	3.214	0.0017	(0.35, 1.52)

Table II: Logistic Regression Analysis

Predictor	B (Estimate)	SE	Wald χ^2	*p*-value	Exp(B) (Odds Ratio)	95% CI (Lower, Upper)
Intercept	1.7546	0.682	6.622	0.010	-	-
Age	-0.2409	0.091	6.977	0.008	0.786	(0.658, 0.940)

Note: SE = Standard Error, CI = Confidence Interval

Table III: Success and Failure Rates Across Age Groups and Genders

Age Group	Gender	Failure Count	Success Count	Total Cases	Success Rate (%)	Failure Rate (%)	*p*-value
A (1-2 years)	Female	6	17	23	73.91	26.09	**0.0385**
	Male	2	24	26	92.31	7.69	**0.0385**
B (3-4 years)	Female	7	20	27	74.07	25.93	**0.0385**
	Male	11	12	23	52.17	47.83	**0.0385**
C (5-8 years)	Female	9	14	23	60.87	39.13	**0.0385**
	Male	14	19	33	57.58	42.42	**0.0385**

Note: Success and failure rates are expressed as percentages. The *p-value* represents statistical significance across age groups, with $p < 0.05$ indicating a significant difference.

Table IV: SPSS Analysis

Statistic	Value
Chi-Square (χ^2)	8.55
Degrees of Freedom (df)	2
p-Value	0.0385

DISCUSSION

The existing literature has no consensus on the optimal timing of probing and nasolacrimal intubation, although it acknowledges probing as the standard treatment for CNLDO. Nasolacrimal duct intubation was introduced in the late 1960s used initially as a secondary procedure after failed probing.[3] Orhan et al reported a success rate of 100% in children aged 18-48 months, in 37.5% of cases as a primary procedure and 62.5% as secondary.[12] PEDIG conducted a prospective, multicenter, non-randomized study on primary silicon intubation in children aged 6 to 45 months and reported a success rate of 90%. While some studies reported a decline in success rates with increasing age due to chronic inflammation and fibrosis[7,1] others suggested no significant correlation between age and treatment success.[13] Additionally, factors such as surgical technique, stent type and duration of tube retention contributes to variable outcomes. Engel et al conducted a retrospective case series of 635 patients aged 6 to 104 months for monocanalicular intubation as the primary treatment for CNLDO with an overall success rate of 96%.[14] The timing of tube removal is usually after 2 to 6 months, however, keeping the tube for more than 3 months has been reported to have a higher success rate in older children.[15] Lim et al. illustrated success rates of 83 to 100% in children aged 1 and 4 years with significantly higher rates of failure if the tube is retained for more than 18 months.[13]

The findings of this study provide significant insights into the success rates of nasolacrimal intubation across different pediatric age groups. The overall success rate varied significantly among different age cohorts (p = .0385), highlighting the impact of age on surgical outcomes. The highest success rate was observed in children aged 1–2 years (83.67%), while the lowest success rate was noted in children aged 5–8 years (58.93%). These findings highlight that younger children, particularly those aged 1–2 years, have significantly higher success rates following the nasolacrimal intubation. Meanwhile, older children especially those aged 5–8 years, exhibited lower success rates and an increased likelihood of requiring additional interventions. These findings align with prior studies which suggest earlier intervention is associated with better outcomes in congenital nasolacrimal duct obstruction (NLDO).[6,16]

The age-related differences in success rates may be attributed to the structural and physiological changes that occur in the nasolacrimal duct as the child grows. Infants and younger children typically have a more compliant ductal system, which may facilitate tube placement and improve surgical success. Conversely, older children may have more fibrotic obstructions, leading to lower success rates and higher failure rates.[17] These findings suggest that early nasolacrimal silicon intubation as a primary procedure could be beneficial for optimizing treatment outcomes in CNLDO cases.

The relatively low rate of serious complications in this study indicates that nasolacrimal intubation remains a safe and effective procedure. However, careful patient selection, precise surgical technique, and close postoperative monitoring are essential for minimizing adverse outcomes.

Given the findings of this study, several clinical recommendations can be made. Early intervention with primary nasolacrimal intubation (preferably between 1–2 years of age) is recommended for optimal surgical outcomes. Conventional approach or probing, repeat probing, and secondary intubation involves multiple procedures done in general anesthesia. Postoperative monitoring is crucial to manage complications such as tube extrusion and cheese wiring which if untreated, could lead to long-term lacrimal dysfunction. Future research should focus on refining surgical techniques to improve outcomes in older children and high-risk subgroups.

While this study offers valuable insights, several limitations exist. A selection bias may occur due to the retrospective nature of this study. Second, the sample size for certain age and gender subgroups was relatively small, which may limit the generalizability of the findings. Nasolacrimal intubation was done by different surgeons with varying levels of surgical expertise and there was no fixed time interval for retention of tubes. Additionally, long-term follow-up data was not included, preventing an assessment of recurrence rates or long-term efficacy of the procedure. Future prospective studies with larger, more diverse populations and extended follow-up periods are needed

to further validate these results.

CONCLUSION

In conclusion, this study highlights the significant impact of age and gender on the success rates of nasolacrimal intubation. The highest success rates were observed in younger children (1–2 years old), reinforcing the importance of early intervention. Gender-based differences were also evident, suggesting potential anatomical or physiological factors that warrant further investigation. Future research should focus on refining surgical techniques and identifying factors that contribute to treatment success or failure.

CONFLICT OF INTEREST

None.

SOURCE OF FUNDING

None.

ETHICAL APPROVAL

Ethical approval was obtained from the Ethical Review Committee of AlShifa Trust Eye Hospital, Rawalpindi (vide ref no. ERC-50/AST-24, dated 11/12/2024) ensuring compliance with all regulatory and ethical guidelines for human research. Informed consent was obtained from the parents or legal guardians of all pediatric participants before enrollment in the study. Confidentiality and patient anonymity were strictly maintained throughout the research process.

Authors' Contributions:

Shafaq Najmi: Conception of study/Designing/Planning

Sumaira Altaf: Experimentation/Study Conduction

Ambreen Yousaf: Analysis/Interpretation/Discussion

Najia Uzair: Manuscript Writing, Critical Review

Rebecca Murtaza: Critical Review

Adila Anwar: Facilitated for Reagents/Material Analysis, Critical Review

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RESEARCH ARTICLE

TO DETERMINE THE MEAN NLR(NEUTROPHIL LYMPHOCYTE RATIO) AND MEAN PLR(PLATELET LYMPHOCYTE RATIO) IN COVID-19 PATIENTS

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ABSTRACT

Objective: *To determine the mean NLR(neutrophil leucocyte ratio) and mean PLR(platelet lymphocyte ratio) in COVID- 19 patients.*

Study design: *Cross Observational Study.*

Place and Duration of Study: *The study was conducted in Medicine unit, Benazir Bhutto Hospital Rawalpindi during the period of May to November 2021.*

Patients and Methods: *A total of 95 patients those who were positive for corona virus by RT-PCR, 20 to 80 years of age, both genders were included. Patients with previous history of asthma, Chronic Obstructive Pulmonary disease, autoimmune disease, ischemic heart disease and chronic liver disease were excluded. The selected patients were given their written informed consent. NLR and PLR were calculated for all the patients on admission versus after 48 hrs. of admission. The data were collected and calculated by the principal researcher on a specially designed proforma.*

Results: *The study included total of 95 patients from 20-80 years with mean age of 46.73 ± 11.16 years. Fifty nine (62.11%) patients were 20-50 years old. Out of total, 39 (41.05%) were male and 56 (58.95%) were females. Mean leucocyte count was 8.05 ± 2.71 x 10^9/L. Mean leucocyte number was 5465 ± 1231 neutrophils/µL. Mean NLR was 5.15 ± 1.26 and mean PLR was 215.88 ± 38.14 in COVID-19 patients. Mean NLR was not significantly associated with changes over time in COVID-19 patients (p =0.21). Mean PLR was significantly associated with changes over time (p= 0.011), showing a statistically meaningful decrease from admission to 48 hours.*

Conclusion: *The study concluded that mean NLR and mean PLR was associated with COVID-19 patients. PLR decreased significantly, consistent with patient improvement. NLR showed a decreasing trend but not significantly, suggesting it may still reflect immune response but not sharply over 48 hours.*

Keywords: *COVID-19, Leucocyte, Lymphocyte, Neutrophil, Platelets*

INTRODUCTION

The novel coronavirus is responsible for causing respiratory infections in more than 30% of the community during the pandemic.[1] This virus has a unique crown like shape under a microscope which gives it a name of corona virus. Now it has been named by the World Health Organization in the first week of March 2019. This virus spread quickly from Wuhan china to all over the globe and currently there were more than 10 million affected people worldwide with greater than 5 million deaths making it a pandemic.[2] This virus spreads from the respiratory tract through air borne droplets and secretions. It has a wide spectrum of presentation. Eighty percent of the individuals are asymptomatic to many being badly affected with severe cardiopulmonary failure leading to high mortality all across the globe. It has an incubation period of 14 days.[3]

The primary means of transmission are respiratory

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Received: 23 Sep 2024; revision received: 27 May 2025; accepted: 18 June 2025

droplets and intimate contact; high aerosol concentrations in a sealed setting can also transmit the disease, fecal-oral transfer has not yet been shown.[2] Covid infection can present with a different spectrum of sign and symptoms, like atypical pneumonia, respiratory failure, acute respiratory distress syndrome (ARDS) and hyper-inflammatory responses.[1] Healthcare professionals are searching for an efficient and practical way to handle patients who are afflicted by the virus, given its worrisome pace of transmission.[3] Approximately 30% of these patients progress to severe illness such as ARDS, pneumonitis, septic shocks, DIC are caused by cytokine storm.[4] This cytokine storm is caused by dysregulated inflammation causing worsening of symptoms in COVID 19 patients.[3,4]

Most common hematological abnormalities are thrombocytopenia, leucopenia and lymphopenia.[4] As far as the biochemical markers are concerned the most affected are raised ALT, LDH, D-Dimers, creatinine kinase, serum ferritin and CRP. These factors are related to severity of disease and have an overall poor prognostic value.[5] The lungs are affected as bilateral consolidation and ground glass appearance affecting the lower lungs.[6] According to the literature review the amount and the duration of immunity that a person might develop after the resolution of the disease is also debatable. It is usually short lived and the disease might recur in the near future.[7] The mean Neutrophil to Lymphocyte ratio and Platelet to Lymphocyte ratio were 7.20 ± 4.20 and 204.25 ±148.42 respectively in severe disease Covid-19 patients. Various hematological parameters in COVID-19 are predictors of disease severity and poor prognosis include high TLC, Platelet count, NLR and PLR ratio. These findings are independent high-risk factor that needs urgent and timely management.[8,9] The aim of the article was to calculate the NLR and PLR in acute covid-19 patients as a simple and cost-effective test. The objective of the study was to determine the mean NLR and mean PLR in COVID- 19 patients.

PATIENTS AND METHODS

The Cross observational study was conducted in Medicine unit, Benazir Bhutto Hospital Rawalpindi during the period of May to November 2021 following ethical approval (vide letter no. NO-MU-I/BBH/0024 dated 10/05/2021). The WHO sample size calculator having 95% Confidence Level, Population mean 7.2%, Population standard deviation 4.20%, Absolute precision required 1%. Sample size were calculated as (n)95 cases on that time. The technique was consecutive sampling. Inclusion Criteria having age between 20-80 years, both gender and all patients those who were positive for corona virus by RT-PCR. Exclusion Criteria having Previous history of COPD/ ischemic heart disease, chronic liver disease, autoimmune disease and asthma. After permission from the ethical review committee, COVID-19 positive patients proven by RT-PCR from Oro/nasopharyngeal swab were enrolled. Patients admitted from the A & E department were included in the study. The selected patients were given their written informed consent. NLR and PLR were calculated for all the patients on admission versus after 48 hrs. The data were collected and calculated by the principal researcher on a specially designed proforma. Data were entered and analyzed in SPSS (Version 21). Frequency and percentages were calculated for categorical variables like gender. Mean and standard deviation were calculated for numerical variables like age, lymphocytic count, neutrophil count and platelet count were used as NLR ratio and PLR ratio. Effect modifiers like age and gender were stratified. Post stratification was done by using independent sample t-test. $p<0.05$ was taken as of significance.

RESULTS

Age range was from 20-80 years with mean age of 46.73 ± 11.16 years. Major part of the 59 (62.11%) patients having 20-50 years of age while 36(37.89%) were 51-80 years. Out of the 95 patients, having 39 (41.05%) male and 56 (58.95%) females. Mean leucocyte count was 8.05 ± 2.71 x 10^9/L. Mean leucocyte count was 5465 ± 1231 neutrophils/µL. Mean NLR was 5.15 ± 1.26 and mean PLR was 215.88 ± 38.14 in COVID-19 patients (Table I). Mean NLR was not significantly associated with changes over time in COVID-19 patients (p=0.21). Mean PLR was significantly associated with changes over time (p= 0.011), showing a statistically meaningful decrease from admission to 48 hours. Stratification of NLR & PLR ratio with respect to age is shown in Table II. Stratification of NLR & PLR ratio with respect to gender is shown in Table III.

Table-I: Mean NLR and PLR in COVID-19 patients (n=95)

	On admission	At 48 th hour
NLR ratio	5.15 ± 1.26	4.89 ± 1.54
PLR ratio	215.88 ± 38.14	201.89 ± 36.54

Table II: Stratification of NLR and PLR ratio with respect to age

Age (years)	NLR ratio		*p*-value	PLR ratio		*p*-value
	Mean	SD		Mean	SD	
20-50	5.23	1.61	**0.421**	216.81	38.47	**0.763**
51-80	5.02	1.41		214.36	38.10	

Table 1II: Stratification of NLR ratio and PLR ratio with respect to gender.

Gender	NLR ratio		*p*-value	PLR ratio		*p*-value
	Mean	SD		Mean	SD	
Male	4.99	1.13	**0.317**	219.13	36.39	**0.324**
Female	5.26	1.34		211.23	40.56	

DISCUSSION

Coronavirus is a largest family of viruses, having spectrum of common types of flu/ cold to Middle East respiratory syndrome and severe acute respiratory syndrome.[10] It was discovered as coronavirus disease (COVID-19) of unexplained viral pneumonia in Wuhan, China in December 2019. In January 12, 2020 was recognized by the World Health Organization. COVID-19 was reported to spread throughout the China and even to other countries[11], causing 34,662 confirmed cases of infection by Feb 8,2020.

After one week, individuals with severe sickness frequently developed dyspnea, while the majority of patients infected with the new coronavirus had mild to moderate illness. Patients with severe illness advanced quickly to septic shock, metabolic acidosis, acute respiratory distress syndrome, acute respiratory failure, and coagulopathy. Early detection of critical disease risk factors allowed for timely entry to the intensive care unit (ICU) and the urgent delivery of supportive treatment. Instead, they must get general isolation therapy. Notably, Cao and colleagues have documented a significant frequency of lymphopenia in COVID-19 patients.[11]Furthermore, it has been established that individuals with acute-on-chronic hepatitis B liver failure may benefit from a short-term prognostic assessment based on their baseline neutrophil-to-lymphocyte ratio.[12,13] This study to determine the mean NLR and PLR in COVID-19 patients. Mean NLR was 5.15 ± 1.26 and PLR was 215.88 ± 38.14 in COVID-19 patients. The mean NLR and PLR in patients who had severe disease was 7.20 ± 4.20 and 204.25 ± 148.42 respectively.[8] In this study of 95 cases of COVID-19 patients, the mean NLR showed a slight decrease from admission (5.15 ± 1.26) to the 48th hour (4.89 ± 1.54), but this change was not statistically significant (p =0.21). In contrast, the mean PLR significantly decreased from 215.88 ± 38.14 to 201.89 ± 36.54 over the same time period, with a statistically significant difference (p =0.011). These results suggest that PLR, but not NLR, may be more sensitive to short-term clinical changes in COVID-19 patients.

The majority of patients have minor, self-limiting illnesses, while those with severe or critical conditions have a very bad outlook. Very soon after the COVID-19 pandemic started, it was discovered that individuals with severe or critical conditions had a much greater NLR than those with less severe illness. It has been demonstrated that NLR is a trustworthy measure for assessing COVID-19 illness severity.[14] Numerous theories have been proposed to explain how neutrophils and lymphocytes react to corona virus infection. Reactive oxygen species released by neutrophils stimulate the immune system and liberate the virus from cells, which is subsequently taken up by antibodies. Furthermore, neutrophils initiate the synthesis of several cytokines. However, despite the fact that the viral infection itself primarily causes a lymphocyte response, systemic inflammation particularly elevated Interleukin 6 levels contraryally reduces the number of lymphocytes and subsequent cellular immunity. These two elements both lead to increased NLR.[15] Therefore an elevated NLR indicates the degree of inflammation.

According to the study, the mean NLR value rises noticeably with increasing disease severity, with the lowest NLR values being seen in asymptomatic and moderate cases of the illness. According to a Cochrane Meta-analysis Review of twenty Chinese research, NLR is a reliable prognostic indicator that can distinguish between COVID-19 illness is severe or not.[16] The outcomes are in line with an Italian research that included 74 patients, where the NLR for severe cases was 5.6 compared to 3.0 for non-severe cases.[17] Findings

demonstrating a direct correlation between patient NLR levels and disease severity were also supported by another meta-analysis. Similar results have also been discovered in Pakistani research carried out in several cities by Pervaiz et al. and Asghar et al.[18,19] In comparison to commonly used scoring severity criteria accepted for pneumonia, such as the CURB-65 Score (which evaluates the 30-day mortality of patients with community-acquired pneumonia) and the MuLBSTA Score (which provides early warning about the mortality of patients with viral pneumonia), a Chinese study suggests that NLR is superior in early prediction of severe and critical illness.[16] Additionally, it was discovered that NLR upon admission was a good indicator of illness severity.

There were significant correlations between greater NLR in COVID-19 severity and mortality in two meta-analyses of n = 19 and n = 13 trials.[14,19] Previous research discovered associations between elevated NLR and low-grade inflammatory chronic diseases, including diabetes mellitus, obesity, hypertension, heart and brain atherosclerotic events, and different types of cancer.[20] Even in individuals with comorbidities, NLR may continue to be able to predict the severity of COVID-19. For instance, in hospitalized patients with various cancer types, NLR strongly predicted COVID-19 severity and survival.[21]Severe COVID-19 is at risk due to several underlying illnesses. It has been proposed that COVID-19 patients died at an 8% greater rate for every unit rise in NLR.[22] According to studies, on-admission NLR can be used as a risk classification technique and may be able to predict the COVID-19 outcome. When NLR hits its height a few days after admission, this predictive capacity rises. But when the patient heals from COVID-19 and the inflammation goes down, NLR progressively loses its prognostic power.[23] A full blood count with differentials is necessary for measuring NLR. This is a common, inexpensive, easily accessible and uncomplicated laboratory test. Finally, distinct COVID-19 variations are exhibiting disparate morbidity and death results.[24]

Qu et al. observed 30 COVID-19 patients and discovered a significant difference in PLR between patients who were in critical condition and those who had less severe COVID-19 symptoms.[25] In a cross-sectional research including 93 COVID-19 patients, they discovered a substantial difference in PLR between patients who were critical and those who had less severe COVID-19 symptoms.[26] PLR is now thought to be a sign of inflammation. Studies have evaluated the relationship between PLR and viral, bacterial or malignant diseases as well as diabetes. According to studies, COVID-19 patient's platelet levels dramatically dropped.[27] Thrombocytopenia is frequently observed in patients in critical condition; it typically indicates the onset of intravascular coagulopathy, major organ failure, or physiologic decompensation rather than a main hematologic aetiology.[28]When a virus infects the lung and mechanical breathing damages the endothelium, platelet activation, aggregation, and thrombosis occur in the lung, resulting in massive platelet consumption. This mechanism for thrombocytopenia in severe acute respiratory syndrome is multifactorial.[25] The mechanism of thrombocytopenia in COVID-19 and SARS is similar. Platelet consumption may be the cause of thrombocytopenia in COVID-19. Coronaviruses can potentially cause an auto-immune reaction against blood cells or directly infect components of the bone marrow, leading to aberrant hematopoiesis.[29] However, it's important to remember that SARS and COVID-19 differ significantly from one another.[30]

Future study is required to update the findings relating to systemic inflammatory markers of COVID-19, given the variety of new variants differing morbidity and death outcomes. NLR & PLR were significantly linked with degree of severity as well as mortality rate in COVID-19 patients too.

CONCLUSION

The study concluded that NLR & PLR were significantly linked with COVID-19 patients. The cost-effective recommendation is to use NLR & PLR as a simple, easily available test for admission patients. It is a useful technique for risk categorization and to predict COVID-19 prognosis.

CONFLICT OF INTEREST

None.

SOURCE OF FUNDING

None.

ACKNOWLEDGMENT

Dr. Nasim Akhtar, Department of Infectious Diseases, Pakistan Institute of Medical Sciences (PIMS), Islamabad Pakistan.

Authors' Contribution

Kanwal Shahzadi: Conception of study/Designing/ Planning, Experimentation/Study Conduction

Khola Noreen: Analysis/Interpretation/Discussion, Manuscript Writing

Abrar Akbar: Analysis/Interpretation/Discussion, Manuscript Writing

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Hunza Altaf: Critical Review, Facilitated for Reagents/Material Analysis

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RESEARCH ARTICLE

PREVALENCE OF HEPATITIS B VIRUS INFECTION IN PREGNANT FEMALES OF RURAL AREAS OF KARACHI AND IDENTIFICATION OF IMPORTANT RISK FACTORS

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ABSTRACT

Objective: *This study undertakes seroprevalence of Hepatitis B Virus(HBV) infection in pregnant females of rural areas and identifies important risk factors associated with hepatitis B virus.*

Study design: *Cross-sectional study*

Place and Duration of Study*: The study was carried out at Baqai Medical University and Muhammadi Blood bank Karachi from January to December 2021.*

Patients and Methods: *A total of 385 samples were collected from pregnant females belonging to different areas of Karachi. Pregnant females of age 17- 45 years of rural areas were included while all non-pregnant females having co-morbids were excluded. Samples were collected in EDTA tubes. Serum was extracted by centrifugation. Screening for hepatitis B was done by Electro Chemi Luminiscence Immunoassay (ECLIA) on cobas e 411 analyzer. Amplification and reporting of HBV was done using Real time PCR. Statistical analysis was done by using SPSS version 25.*

Results: *The prevalence of HBV is 10.4% in pregnant females. Important risk factors identified includes middle aged pregnant females (13.5%) having lack of education (42.2%) belonging to low socioeconomic status (14.5%) and most of them are housewives. The proportion of pregnant females found to be infectious who did give history of contact with diagnosed cases of hepatitis was 100% and 58.3% had positive history of transfusion. There was significant association of history of miscarriage and HBV (15.9%). History of previous C-section with hospital admissions were found significantly associated with HBV.*

Conclusion: *Our findings are depictive of an increasing trend and also highlight the important risk factors associated with spread of this virus in community. Lack of awareness among general population, reproductive age bracket, inappropriate screening of blood at rural health centers and malpractice of surgical procedures are some of the important risk factors pointed out in our study.*

Key words: *Hepatitis B, Pregnant females, Risk factors*

INTRODUCTION

Hepatitis is a potentially life threatening infection. WHO has therefore emphasized on its complete eradication by the year 2030 through early investigations, effective management plans and prompt preventive measures.[1] Hepatitis B virus (HBV) is a blood borne infectious agent.[2] According to the data quoted by WHO 2% of the population is affected in Southeast Asia.[3] Pakistan is included under the region where HBV is endemic.[4]

Pregnancy is a hyper metabolic state in which a pregnant woman undergoes profound changes in anatomy and physiology of body. All the vital systems will adapt to changing requirements helping the mother and child to cope up with increased demands. These physiological changes will cause problems in appreciating clinical features and changes in laboratory investigations in pregnant woman and it will be a tiresome and thought provoking job.[5]

Viral infections occurring at the time of pregnancy is a major threat to fetal well- being and also posing a great

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Received: 12 May 2025; revision received: 22 May 2025; accepted: 10 Jun 2025

risk to mother health.[6] It can be transmitted by many routes like crossing through placental barrier or parenteral by infectious body secretions.[7] Pregnant females infected with viral hepatitis of any type needs to be thoroughly evaluated and carefully monitored as it is regarded as the most likely cause of jaundice in pregnant females.[8]

There is an increase in duplication and growth of HBV during gestational period.[9] According to the estimates frequency of HBV infection is reported to be 27 times greater in Asian American and 5 times more in African American pregnant population in comparison to white population.[10] HBV is very much prevalent in expecting mothers particularly in those populations where it is found to be endemic. Arrival of newborn in those cases can be accompanied with a lot of risks. In areas where it is endemic 50% will be suffering from chronic hepatitis B either at birth or infancy and there is a higher risk of chronic hepatitis later on.[11,12]

PATIENTS AND METHODS

This descriptive cross-sectional study was started after the approval of synopsis from the Ethics Committee & Board of Advanced Studies and Research (BASR), (Ref: BMU-EC/07-2020) dated 6/11/2020. It was carried out at Baqai Medical University and Muhammadi Blood bank from January 2021 to December 2021. Samples were collected from different areas of Karachi including Fatima hospital (Teaching hospital Baqai Medical University Gadap Town Karachi), Creek General Hospital, Korangi and Lyari General hospital Karachi from pregnant females of less than 45 years of age. All serological and molecular tests were performed at Muhammadi Laboratory and Diagnostic Centre Numaish Karachi. Written informed consent was taken from all the participants after explaining details of the study procedure. Samples were collected in EDTA tubes. Serum was extracted by centrifugation. Screening for hepatitis B was done by electrochemiluminescence immunoassay (ECLIA) on cobas e 411 analyzer. DNA extraction of reactive samples was done by QIAGEN extraction kit using automated QIAcube Germany. Amplification and reporting of HBV was done using Real time PCR (QIAGEN 3rd generation, HRM channel Germany).

The sample size for study population was 385. It was calculated by WHO calculator keeping confidence interval of 95%.[13] Pregnant females of age 17 years to 45 years belonging to rural areas were included in the study while all non-pregnant females belonging to urban areas were excluded.

For evaluation of health status of the participants a detailed personal history was taken in the form of questionnaire. In addition of having some basic information including name, age, gender, address, marital status, family income, education level, transfusion history some questions pertinent to the study like number of pregnancies, mode of delivery, awareness regarding HBV is also taken into account.

The data was be tabulated on Microsoft excel. Statistical analysis was done by using SPSS version 25.0. The results were displayed in frequency (%) by using descriptive statistics. Chi square/Fisher Exact test was used for determination of association between the parameters. Odd ratio and 95% confidence interval were calculated. Level of significance (p) was kept as <0.05.

RESULTS

A total of 385 pregnant females who visited antenatal clinics were screened. The prevalence of HBV in our study population was 9.1%

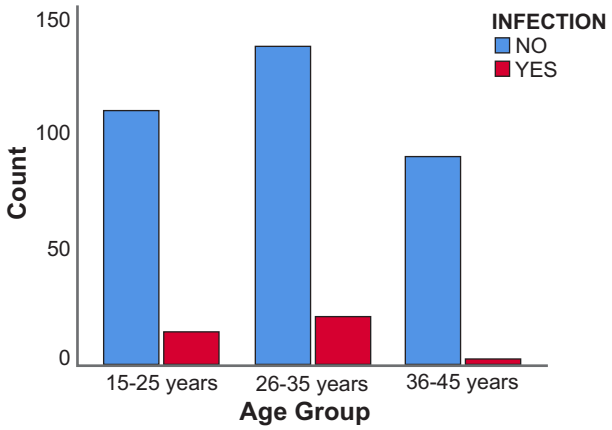

Figure 1: The prevalence of HBV infection in different age groups

There was significant difference in the proportion across the HBV infection per various age groups. The proportion of 15-25 years females who were found to be infectious were 11.8% (15/127). While proportion of 26-35 years females who were found to be infectious were 13.5% (22/163). Moreover, proportion of 36-45 years females who were found to be infectious were 3.2% (3/95) as shown in Figure 1.

There was a significant association between prevalence of HBV infection among different education levels (p<.001). Ninety (23.4%) individuals were illiterate out of which 38 tested positive for HBV. One hundred and

fifty four (40.0%) got primary education and 1 tested positive for HBV, 134 (34.8%) acquire secondary education with 1 individual having HBV and 7 (1.8%) got higher education with no positive cases. The proportion of pregnant females found to be infectious who were illiterate was 42.2%, those having primary education was 0.6%, while those having secondary and higher education showed prevalence of 0.7% and 0% respectively.

There was a significant association between prevalence of HBV infection with occupation of females [x2(1, N=385) =9.391, *p*=.002]. It was found that housewives were more likely to be infected than working women.

There was a significant association between prevalence of HBV infection among different socio-economic groups (*p*=.003). The proportion of females belonged to low socio-economic group who were found to be infectious were 14.5% (35/242). While proportion of females belonged to middle socio-economic group who were found to be infectious were 3.6% (5/140). Moreover, proportion of females belonging to high socio-economic group who were found to be infectious were 0%.

There was a significant association between history of hepatitis contact and prevalence of viral hepatitis infection [*p*=.005]. The proportion of pregnant females found to be infectious who did not give history of hepatitis contact was 8.4% while proportion of pregnant females found to be infectious who did give history of contact was 100% (5 individuals had history of contact with hepatitis patients and all tested positive for HBV) as shown in Figure 2.

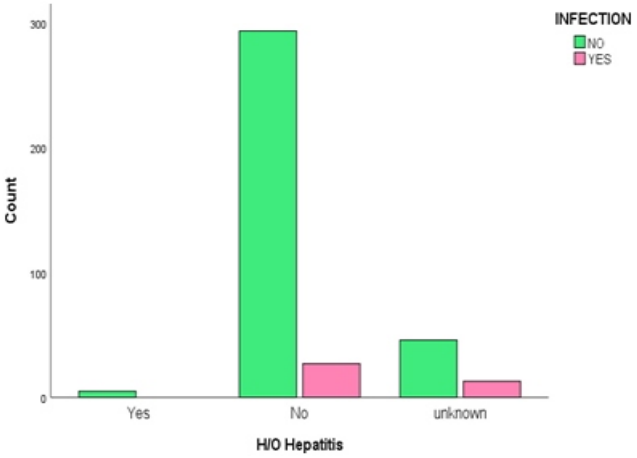

Figure 2: History of Hepatitis contact and frequency of HBV infection among study participants

There was significant association of history of miscarriage and HBV infection [x2(1, N=385) =19.375, *p*<.001]. Thirty seven individuals having previous history of miscarriage tested positive for HBV while only 3 showed positivity for HBV without history of miscarriage. It was concluded that females having history of miscarriage were more likely to be infected [OR-(CI): 9.487-(2.870-31.362), *p*-value: 0.002) as shown in Figure 3.

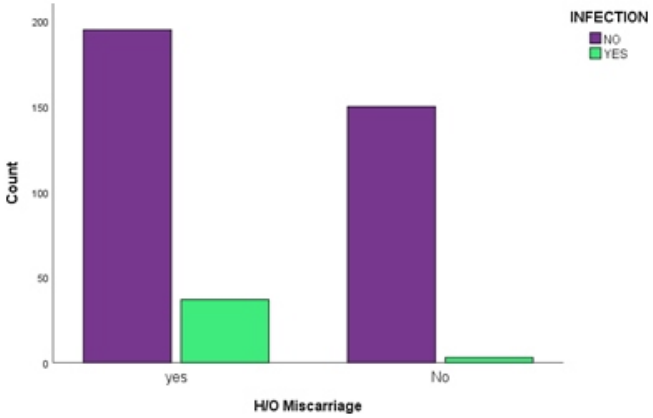

Figure 3: History of Miscarriage and frequency of HBV infection among pregnant females

There was significant association of mode of delivery of last childbirth and HBV infection [x2(2, N=385) =40.220, *p*<.001] as shown in Figure 4.

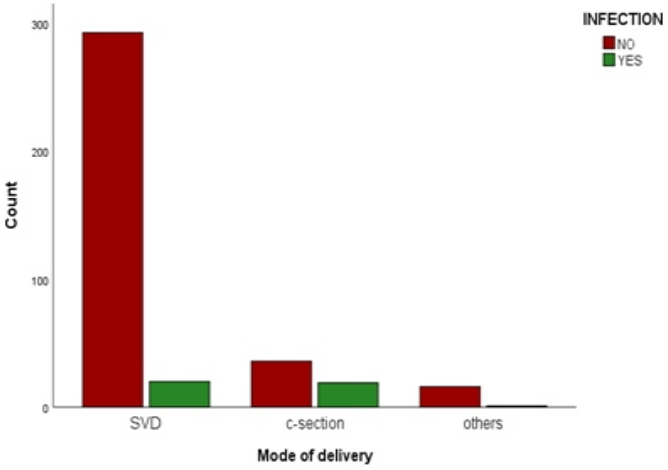

Figure 4: Mode of delivery of last child birth and frequency of viral hepatitis infection in study participants

There was significant association of place of delivery of last childbirth and HBV infection [x2(2, N=385) =35.136, *p*=<.001] as shown in Figure 5.

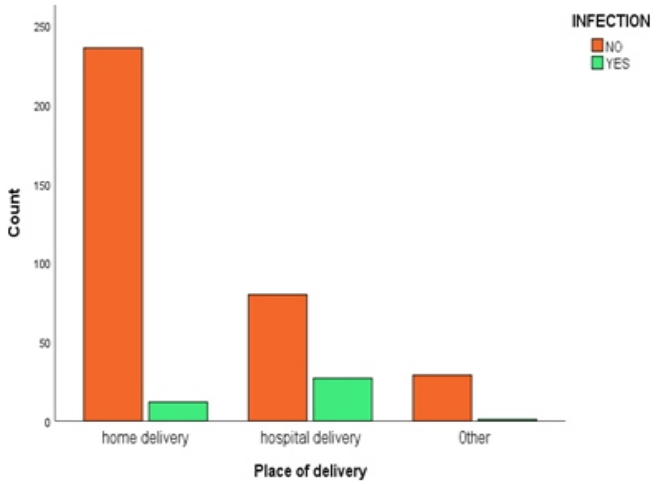

Figure 5: Place of delivery of last child birth and frequency of HBV infection

There was significant association of history of transfusion and HBV infection [x2(1, N=385) =112.87, *p*<.001]. The proportion of pregnant females found to be infectious who did give history of transfusion was 58.3% while proportion of pregnant females found to be infectious who did not give history of transfusion was 3.6%. It was found that females having history of transfusion were more likely to be infected [OR-(CI): 27.26- (12.49-59.49), *p*-value: <.001) as shown in figure 6.

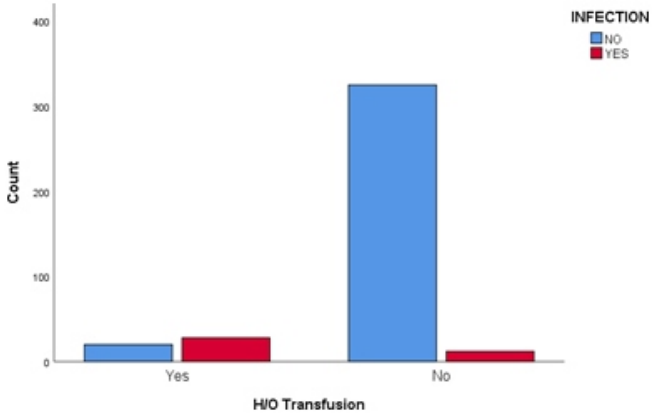

Figure 6: History of transfusion and prevalence of HBV infection

DISCUSSION

A total of 385 pregnant females were made a part of study. Out of these 35 participants tested positive for HBV infection showing prevalence of 9.1% respectively. The disease burden is affecting developing regions like Pakistan, especially rural population of Sindh province.[12] A study carried out in Sindh showed frequency of positive cases of hepatitis B to be 6.7% emphasizing on the importance of associated risk factors like history of previous transfusion of blood and its products, hospital admissions, needle stick injuries and use of contaminated equipment.[13] Researches carried out globally like in Saudi Arabia and China showed seroprevalence of HBV to be 4.1% and 7.5% respectively in expecting mothers. [14]

Our study undertakes various demographic characteristics and important risk factors as HBV infection is quite prevalent in our region and is on a continuous rise.[15] We noted that prevalence of Hepatitis B infection is found more in middle age groups, while pregnant females of less than 26 years of age and more than 36 years of age were less affected (Figure 1).Thus it suggests that major age group belongs to reproductive age bracket focusing on due importance to preventive measures in all females of reproductive age. Studies carried out in India and Nigeria also suggests similar findings.[16]

Education status and hepatitis B infection has a negative correlation indicating that improving education of the individuals will lead to better understanding of the disease consequences and preventive measures. Similar findings were observed in other studies like the study carried out in our own country[17] and also observed globally like in Italy[18] which indicate that a low literacy rate is also a risk factor for the spread of this virus.

Occupation is also considered as part of the risk factors, in which the study population was divided into two halves, house wives and working women. The outcome of study represents a rise in seroprevalence of HBV in housewives. Similar finding was also concluded in a study carried out in Nigeria showing highest prevalence in house wives[19] pointing to better awareness among working ladies.

The study population was grouped into three including low, middle and high socioeconomic groups. The results showed higher incidence in low socioeconomic group. Similar results have been observed in other studies.[20,21]

History of hepatitis contact has a direct relationship with positive cases of HBV (Figure 2). A study carried out in Nigeria represented an increased prevalence of HBV infection in women who gave positive history of contact with house hold members or friends with a known positive history of previous hepatitis B infection. [22]

It is also noted that hepatitis B virus has a positive correlation with miscarriage. The study population who were positive for Hepatitis B infection gave a positive

history of miscarriage as compared to others. (Figure 3) A significant association was established in a study conducted in Ethiopia and Nigeria indicating a lack of sterilization practices.[23] Patients who had undergone C-section in the hospitals were at a greater risk of infection (Figure 4 and 5). Similar findings were also observed in studies carried out in other parts of the world[24] suggestive that sterilization practices need improvement.

Transfusion of blood and its products is considered a risk factor for spread of HBV infection (Figure 6).This finding is supported by a study conducted in Nigeria.[25]

There is lack of follow up for treatment of the patients and investigation of children born to hepatitis positive mothers.

CONCLUSION

This study highlights the importance of the serological screening of HBV in pregnant females belonging to rural areas. It is shown that simple screening of HBV by ELISA in pregnant females can be helpful in early detection of positive cases which can be confirmed by Real time PCR. Moreover by estimating the prevalence in expecting mothers we can point well towards estimating their levels in the overall occupants of the society.

It is indicative of a rising trend of HBV cases and also highlights the important demographic and risk factors associated with spread of this virus in community. Lack of awareness among general population, reproductive age bracket, inappropriate screening of blood and its products at rural health centers and malpractice of surgical procedures are some of the important risk factors pointed out in our study.

CONFLICT OF INTEREST

None

SOURCE OF FUNDING

It is partially funded by Baqai Medical University and partially self-financed.

Authors' contributions:

Zarrish Qasim: Conception of study/Designing/Planning, Experimentation/Study Conduction, Analysis/ Interpretation/Discussion, Manuscript Writing, Critical Review, Facilitated for Reagents/Material Analysis

Muhammad Younus Jamal Siddiqi: Conception of study/ Designing/Planning, Experimentation/Study Conduction, Manuscript Writing, Critical Review

Syeda Hira Abid: Experimentation, Study Conduction, Manuscript Writing

Maeesa Wadood: Experimentation/Study Conduction, Facilitated for Reagents/Material Analysis

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RESEARCH ARTICLE

COMPARISON OF THE EFFECTS OF LEVOCARNITINE VERSUS NORMAL SALINE IN THE TREATMENT OF INTRADIALYTIC HYPOTENSION

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Armed Forces Institute of Urology (AFIU), Combined Military Hospital (CMH), Rawalpindi Pakistan

ABSTRACT

Objective: *To evaluate the outcome of levocarnitine versus normal saline in the treatment of intradialytic hypotension*

Study Design: *Pre-post quasi-experimental study*

Place and Duration of Study: *Oct 2024 to March, 2025 Armed Forces Institute of Urology (AFIU), Combined Military Hospital, Rawalpindi Pakistan .*

Patients and Methods: *Thirty five patients(experimental group:15 and control group:20) were included in the study over a period of 12 weeks. Outcomes, like Dialysis-related hypotension episodes, mean change in hemoglobin levels, fatigue, and cramps were measured. Data were analyzed using SPSS version 26.*

Results: *Both groups, had substantial decrease in Dialysis-related hypotension episodes, (p=0.05, for control: and experimental p=0.04). Experimental group found the elevation in Hb levels, (1.6g/dl, p=0.01). No changes were found in the serum creatinine and Echocardiographic outcomes.*

Conclusion: *L-carnitine supplementation reported to have significant changes in clinical outcomes, Dialysis-related hypotension, Hb levels, and quality of life in kidney Patients.*

Keywords: *Effects, Intradialytic hypotension, Levocarnitine, Normal Saline*

INTRODUCTION

In the 21st century, chronic kidney disease (CKD) has become one of the most significant and prevalent causes of mortality and morbidity.[1] CKD has been affecting an increasing number of patients, with an estimated 843.6 million individuals worldwide in 2017.[2] In order to sustain life, patients frequently necessitate renal replacement therapy, such as dialysis, as chronic kidney disease advance.[3] In South Asian countries that are rapidly urbanizing, such as Pakistan, the prevalence of chronic kidney disease (CKD) is likely to be exacerbated. A substantial portion of the 180 million population is predisposed to chronic diseases, including diabetes and hypertension, which are potentially associated with low birth weight and reduced renal reserve.[4] Hemodialysis is a frequently employed treatment for end-stage renal disease (ESRD), providing a critical intervention for numerous patients.[5]

Hemodialysis is capable of effectively eliminating contaminants and preserving fluid-electrolyte equilibrium; nevertheless, it poses specific obstacles.[6] Dialysis-related hypotension (DRH) is a prevalent and significant complication that impacts approximately 20-50% of dialysis sessions worldwide.[7] DRH is defined a substantial decrease in blood pressure that occurs during or immediately after dialysis, leading to symptoms such as vertigo, disorientation, and, in severe cases, cardiovascular instability.[8] This complication increases the likelihood of adverse cardiovascular events, elevates morbidity, and reduces dialysis efficiency.[7,9]

New evidence indicates that levocarnitine is advantageous in the treatment of DRH.[10] This naturally occurring compound is crucial for the metabolism of

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Received: 15 Mar 2025; revision received: 18 Apr 2025; accepted: 29 May 2025

fatty acids and the production of energy. However, patients with chronic kidney disease experience a substantial decrease in its levels as a result of impaired renal synthesis and dialytic losses.[11] Intradialytic hemodynamic stability has been enhanced by levocarnitine supplementation, which has also improved myocardial function and overall energy metabolism by addressing this deficiency.[10,12] The therapeutic efficacy of levocarnitine in reducing DRH remains a subject of ongoing research, despite its potential.

PATIENTS AND METHODS

Quasi experimental study was carried out in Nephrology department, AFIU, CMH Rawalpindi following Ethical Approval (vide letter no. Nephro-Trg-1/IRB/2024/017 dated 25/09/2024).

18-65 years of patients, clinically stable and with symptoms of intradialytic hypotension, muscle cramps, during or after session, muscle weakness.

Patients with previous history of levocarnitine therapy, blood transfusion, seizure disorder, or drugs senstitive to levocarnitine.

The calculation was based on the following parameters:

$$n=(Z_{\alpha/2}+Z_{\beta}/\Delta/\sigma)^2\times 2\sigma^2$$

Where n is the required sample size per group, $Z_{\alpha/2}$=1 for 95% confidence, Z_{β}=0.84 for 80% power, Δ=10 is the mean difference in DRH episodes, and σ=15 is the standard deviation of the outcome, based on previous study findings. [13] The formula yielded a required sample size of approximately 45 participants to achieve adequate statistical power. This was split into 20 participants in each group. The intervention protocol was designed to assess the effects of intravenous (IV) levocarnitine supplementation on dialysis-related outcomes. Xperimental groups patients were given, IV Levocarnitine 1gm 3 times a week. Where control group were given normal saline. And followed for 12 weeks.

All participants were advised to restrict salt intake to less than 4gm/day.

For control group A predetermined volume of 0.9% normal saline (generally 100–250 ml) was administered intravenously over a period of 5-15 minutes as soon as a drop in blood pressure indicative of IDH (e.g., systolic BP < 90 mmHg or a >20 mmHg drop from baseline) is detected during the hemodialysis session.[14] Routine follow-ups were scheduled for all patients to ensure adherence to prescribed protocols and monitor clinical outcomes. Control and experimental group both had 20 patients, there was lost to follow up for 5 in control group

Primary outcome was frequency of DRH for 12 weeks. Secondary outcomes were, Hb level, improvement in

Table I: Baseline characteristics of the study sample

Characteristic	Control Group (n = 15)	Experimental Group (n = 20)
Gender n%		
Male	10	12
Female	5	8
Age (years: Mean ± SD)	40.30 ± 13.58	47.30 ± 11.69
Duration of hemodialysis (Months: Mean ± SD)	9.20 ± 2.25	9.60 ± 2.50
BMI	23.5 ± 3.4	24.2 ± 3.6
Associated Conditions (Number of Patients)		
Diabetes mellitus with hypertension	02	03
Tuberous sclerosis	0	01
Chronic pyelonephritis	01	01
Chronic glomerulonephritis	02	-
Blood transfusion over study duration (units: Mean ± SD)	2.20 ± 2.13	3.30 ± 1.41
Time since last blood transfusion (Days: Mean ± SD)	36.50 ± 7.05	37.60 ± 8.18
Baseline Hemoglobin (g/dL: Mean ± SD)	9.5 ± 1.2	9.2 ± 1.4
Baseline Kidney Function (Mean ± SD)		
Serum Creatinine (mg/dL)	9.8 ± 2.0	10.2 ± 2.3
Blood Urea Nitrogen (mg/dL)	65 ± 15	67 ± 14
Baseline Dialysis Parameters (Mean ± SD)		
Pre-dialysis systolic BP (mmHg)	140 ± 12	138 ± 10
Post-dialysis systolic BP (mmHg)	125 ± 14	123 ± 12

kidney functions, echocardiographic outcomes, like LVEDV, LVEF, mitral inflow velocities.

Dialysis-related symptoms, including fatigue, muscle cramping, and myopathy, were assessed using a structured symptom checklist. The intervention's impact on clinical outcomes was quantified through the calculation of mean differences and percentage changes. SPSS (version 26) was employed to collect enter and conduct all analyses.

RESULTS

The final analysis comprised 35 patients: 15 in the control group and 20 in the experimental group, following the loss of 5 patients to follow-up in the control group. The control group exhibited a mean age of 40.30 years (± 13.58), whereas the experimental group demonstrated a mean age of 47.30 years (± 11.69). The duration of hemodialysis was comparable between the two groups (control: 9.20 ± 2.25 months; experimental: 9.60 ± 2.50 months). The baseline measurements of kidney function, and blood pressure were similar. The experimental group exhibited elevated blood transfusion rates (3.30 ± 1.41 units compared to 2.20 ± 2.13 units).

The analysis of dialysis-related hypotension (DRH) frequency outcomes are shown in Table II, Figures I. At baseline, the frequency of DRH episodes was comparable between the control group (3.6 ± 1.2 episodes/week) and the experimental group (3.2 ± 1.4 episodes/week), with no statistically significant difference ($p = 0.72$). After 12 weeks of intervention, the experimental group demonstrated a marginal increase in DRH episodes (2.9 ± 0.8 episodes/week), while the control group exhibited a reduction to 2.7 ± 1.0 episodes/week. The between-group comparison at 12 weeks approached statistical significance ($p = 0.05$).

Interdialytic weight gain significantly decreased in the experimental group (1.8 ± 0.4 kg, $p = 0.04$) compared to the control group (2.4 ± 0.6 kg, $p = 0.58$). Hemoglobin levels improved more in the experimental group (10.8 ± 1.1 g/dL, $p = 0.01$) than in the control group (9.8 ± 1.0 g/dL, $p = 0.62$). Serum creatinine and dialysis adequacy remained stable in both groups. Additionally, the experimental group reported significant improvements in fatigue (4.5 ± 1.1, $p = 0.01$) and muscle cramping (1.0 ± 0.4, $p < 0.01$) compared to the control group.

The comparison of echocardiographic parameters between the experimental and control groups revealed no significant differences across all measured variables. Left ventricular ejection fraction (LVEF) were also similar, with mean values of 56.00 ± 7.50% in the experimental group versus 55.50 ± 8.00% in the control group $p = 0.811$.

Table II: Comparison of clinical and laboratory outcomes between control and experimental groups at baseline and after 12 weeks of intervention

Outcome	Time Point	Control Group (Mean ± SD)	Experimental Group (Mean ± SD)	*p* value
Frequency of DRH episodes/week				
	Baseline	3.6 ± 1.2	3.2 ± 1.4	0.72
	12 weeks	2.7 ± 1.0	2.9 ± 0.8	0.05
***p* value**		0.05	**0.04***	

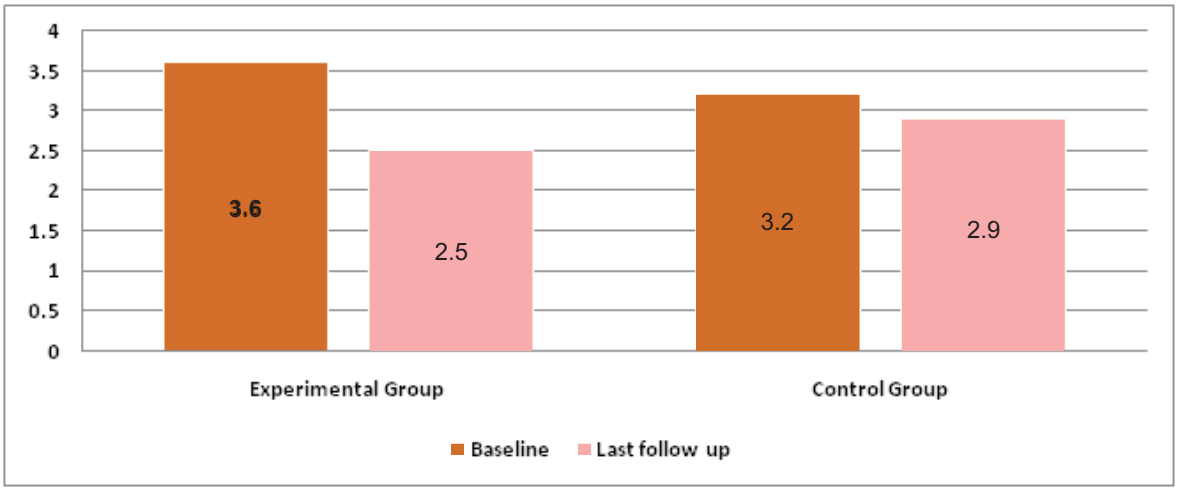

Figure I. Mean frequency of DRH episodes/week among study groups

Table III: Comparison of outcomes at baseline and after 12 weeks

Outcome	Time Point	Control Group (Mean ± SD)	Experimental Group (Mean ± SD)	*p*-value
Interdialytic weight gain (kg)				
	Baseline	2.5 ± 0.7	2.3 ± 0.6	0.58
	12 weeks	2.4 ± 0.6	1.8 ± 0.4	**0.04***
Hemoglobin (g/dL)				
	Baseline	9.5 ± 1.2	9.2 ± 1.4	0.62
	12 weeks	9.8 ± 1.0	10.8 ± 1.1	**0.01***
Serum creatinine (mg/dL)				
	Baseline	9.8 ± 2.0	10.2 ± 2.3	0.55
	12 weeks	9.9 ± 1.8	9.5 ± 2.0	0.44
Dialysis adequacy (Kt/V)				
	Baseline	1.2 ± 0.2	1.3 ± 0.3	0.45
	12 weeks	1.2 ± 0.2	1.4 ± 0.2	**0.01***
Fatigue (1–10)				
	Baseline	7.5 ± 1.0	7.4 ± 0.8	0.81
	12 weeks	6.8 ± 1.2	4.5 ± 1.1	**0.01***
Muscle cramping frequency/week				
	Baseline	2.2 ± 0.8	2.4 ± 1.0	0.65
	12 weeks	2.0 ± 0.6	1.0 ± 0.4	**0.00****

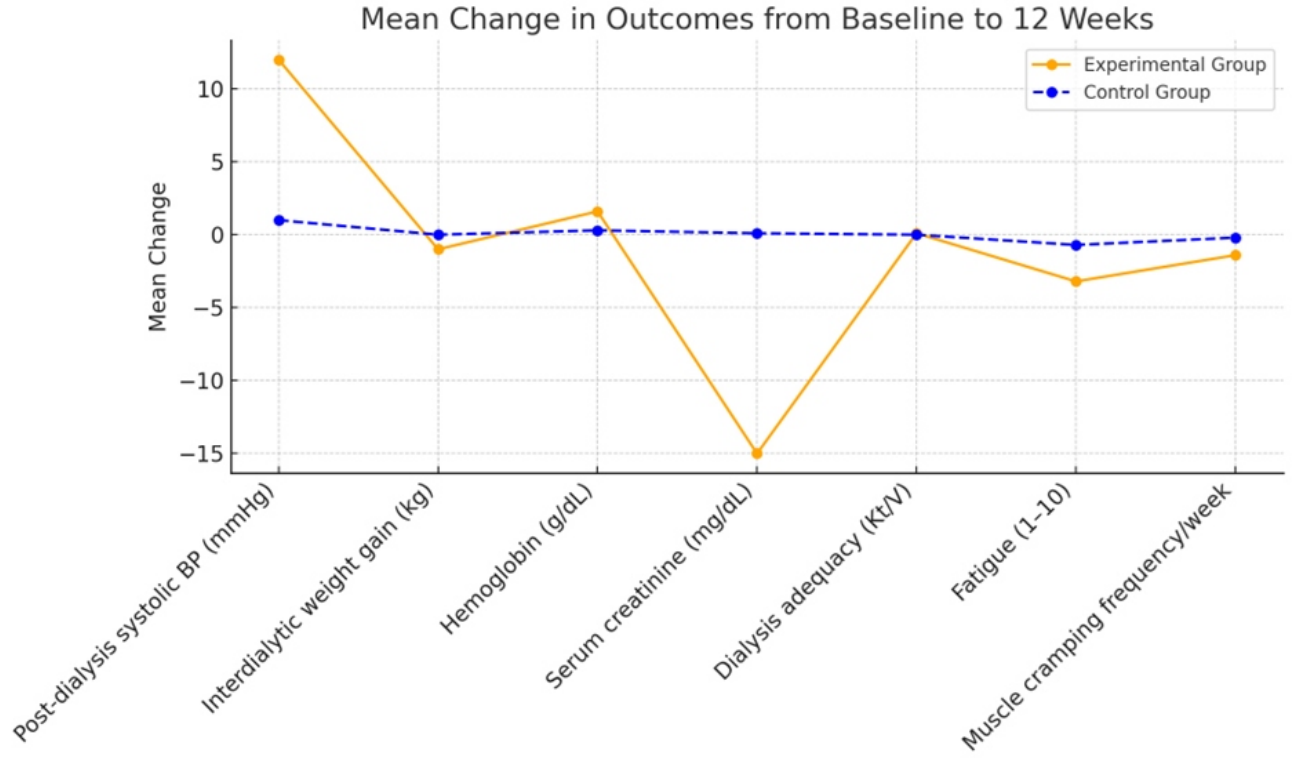

Figure II. Mean change in clinical and laboratory outcomes between control and experimental groups at baseline and after 12 weeks of intervention

Table III: Comparison of outcomes at baseline and after 12 weeks

Parameters	Control Group (Mean ± SD)	Experimental Group(Mean ± SD)	*p*-value
LVEDV index, mL/m²	62.80 ± 15.50	62.50 ± 16.00	0.870
LVEF (%)	55.50 ± 8.00	56.00 ± 7.50	0.811
Mid RV (cm)	2.96 ± 0.35	2.95 ± 0.30	0.932
Early diastolic mitral inflow velocity (E), cm/s	81.00 ± 24.50	80.00 ± 25.00	0.876
Late diastolic mitral inflow velocity (A), cm/s	85.00 ± 21.00	84.50 ± 20.00	0.910
Early diastolic mitral annulus velocity (e'), cm/s	6.10 ± 1.60	6.00 ± 1.50	0.822
Mitral E/e'	13.70 ± 4.20	13.80 ± 4.00	0.889
PAP, mm Hg	32.50 ± 8.50	32.00 ± 9.00	0.865

DISCUSSION

Our findings indicate that L-carnitine supplementation resulted in significant improvements in several clinical markers, suggesting its potential benefits for this patient population.

Both the experimental and control groups had a decrease in dialysis-related hypotension (DRH) occurrences during the course of the 12-week trial. Groups did not differ in the baseline frequency of DRH incidents (p = 0.72). The experimental group had a little increase in DRH episodes (2.9 ± 0.8 per week) after 12 weeks, in contrast to the control group, which demonstrated a decrease (2.7 ± 1.0 per week). While the between-group comparison at 12 weeks was almost statistically significant (p = 0.05), the within-group analysis revealed significant decreases in DRH episodes in both the control and experimental groups (p = 0.05 and p = 0.04, respectively). Previous research has shown that L-carnitine supplementation alleviated DRH episodes in certain trials but not others. This finding lends credence to that finding. Lynch et al. [15] found 145 people in 4 randomized controlled trials (RCTs) studying hypotension due to dialysis and 149 people in 6 RCTs studying muscle cramps. Efforts to alleviate hypotension and muscle cramps caused by hemodialysis were not beneficial. Recently, Chewcharat et al. [12] evaluated dialysis-related hypotension in a meta-analysis of 8 RCTs including 224 participants. Based on the evidence, it seems that L-carnitine may ward against this condition. The meta-analysis gained a better understanding of the effectiveness of L-carnitine supplementation using subgroup analyses that were based on technique, dosage, and duration of supplementation. Although our results provide credence to the better trend shown in previous meta-analyses, we did not find a statistically significant reduction in DRH episodes in the experimental group. Demographics, sample size, and analytical methods (such as the subgroup analyses used by Chewcharat et al.) all have a role in the results. Longer supplementation periods and more accurate doses may give higher benefits due to the complex effects of L-carnitine on dialysis-related hypotension, according to our meta-analyses. The improvement in hemoglobin levels (+1.6 g/dL, p = 0.01) observed in the experimental group is consistent with earlier studies highlighting L-carnitine's role in ameliorating renal anemia. Mechanisms such as enhanced red blood cell function and reduced erythropoietin requirements have been proposed to explain this effect. These findings align with the literature where L-carnitine supplementation has been linked to improved erythropoiesis and anemia management in hemodialysis patients. [16,17] Additionally, significant reductions in fatigue and muscle cramps observed in this study are in agreement with findings by Kuwasawa et al. and Ulinski et al. who reported that L-carnitine alleviates dialysis-related symptoms and improves quality of life. [17,18]

CONCLUSION

L-carnitine supplementation reported to have significant changes in clinical outcomes, DRH, Hb levels, and QoL in kidney Patients.

CONFLICT OF INTEREST: None.

SOURCE OF FUNDING: None.

Authors' Contribution

Aqsa Saleem: Conception of study/Designing/Planning

Nouman Kashif: Analysis/Interpretation/Discussion

Faisal Basharat: Experimentation/Study Conduction

Maryam Sibghat: Manuscript Writing

Misbah Farooq: Critical Review

Farrukh Islam: Critical Review

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RESEARCH ARTICLE

COMPARISON OF SURGERY TIME IN PHACOEMULSIFICATION WITH AND WITHOUT PRE-OP ALPRAZOLAM

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ABSTRACT

Objectives: *To compare the effect of pre-operative administration of oral alprazolam on phacoemulsification time in patients undergoing cataract surgery.*

Study Design: *Case control Study*

Place and Duration of Study: *This was a prospective cohort study conducted at Fauji Foundation Hospital, Rawalpindi from August to September 2024.*

Patients and Methods: *A total number of 100 patients undergoing phacoemulsification with intraocular lens implantation were divided into 2 groups. One received oral alprazolam 1 mg, 1 hour prior to surgery, while the other was not given any medication. Time taken since start of phacoemulsification till the removal of the last piece of nucleus was noted. Results were compiled and the means of the two groups were compared using independent samples t-test.*

Results: *A total of 94 females and 06 males participated in the study. The mean age of the participants was 63.1 ± 7.51 years. There were no significant differences between the two groups in terms of age or gender distribution. In Group A (Alprazolam), the mean surgery time was 4.74 ± 2.09 minutes, whereas in Group B (Control), the mean surgery time was 7.84 ± 2.42 minutes. This difference was statistically significant, with a p-value of less than 0.01.*

Conclusion: *Preoperative administration of oral alprazolam significantly reduces phacoemulsification time in cataract surgery, likely due to reduction in patient anxiety and patient movement during the procedure and therefore enhances surgical outcomes.*

Keywords: *Cataract Surgery, Phacoemulsification, Alprazolam, Conscious Sedation, Surgery Time, Anxiety*

INTRODUCTION

Cataract surgery, particularly phacoemulsification, requires precision and patient stability is critical for achieving optimal outcomes. The procedure typically takes 30 to 60 minutes under normal circumstances, but even minor patient movements such as head tremors or involuntary eye movements can complicate surgery, prolong the operating time and potentially lead to complications.

Patient anxiety is a known factor that increases movement during surgery, especially when patients are conscious. In such cases the high awareness of the patient can exacerbate problem especially in the elderly populations that are more prone to involuntary tremors. Intraoperative head drift and eye movements significantly compromises the quality of surgery and increases the risk of complications, thereby mandating the need of some form of patient relaxation before and during the surgery.[1]

Patient discomfort and pain may occur due to a number of factors such as the light from the operating microscope, handling of the iris, and the insertion of the intraocular lens.[2,3] Preoperative administration of sedatives may help alleviate this anxiety, minimizing movement and thus facilitating a smoother surgical process.

Alprazolam, an anxiolytic drug, has a primary mechanism of action to enhance GABAergic activity in neurons, which promotes relaxation, reduces anxiety and induces mild sedation.[4] This anxiolytic effect is

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Received: 13 Nov 2024; revision received: 16 Jan 2025; accepted: 28 Jan 2025

particularly important in surgical contexts where patient cooperation is critical.

Previous studies have shown usage of other agents like fentanyl in cataract surgery in conjunction with topical anesthesia to reduce pain and anxiety with some success.[5,6] Alprazolam, an over-the-counter benzodiazepine commonly prescribed for anxiety has been hypothesized to improve surgical efficiency when administered preoperatively by inducing conscious sedation. This study aimed to investigate the effect of preoperative alprazolam on the phacoemulsification time in patients undergoing routine cataract surgery.

PATIENTS AND METHODS

This was a prospective cohort study conducted at a tertiary care hospital from August to September 2024. The study compares two groups of patients undergoing phacoemulsification cataract surgery. One group received preoperative alprazolam while the other was a control group which received no sedation.

The study included patients aged 49 to 79 years undergoing routine cataract surgery. Participants were divided into two groups: Group A (Alprazolam group) patients received a 1 mg dose of alprazolam 1 hour before surgery while Group B (Control group) patients received no sedative preoperatively. Informed consent was taken from all participants and approval for the study was obtained from the institutional ethics committee.

Patients were selected through non-probability consecutive sampling. The inclusion criteria for this study required participants to be between 40 and 80 years of age, eligible for routine cataract surgery with nuclear sclerosis (NUC standard 2), based on the WHO Cataract Grading Scale 2002. Exclusion criteria included those with known benzodiazepine allergies, pre-existing neurological conditions that cause tremors, or severe systemic illnesses such as uncontrolled diabetes or hypertension. Patients with conditions that could extend surgery duration such as small pupils, pseudoexfoliation syndrome, zonular weakness, prior intraocular surgeries, traumatic or brown cataracts, mature or hypermature cataracts, posterior polar cataracts, corneal haze, or hearing impairments were also excluded.

The protocol for phacoemulsification cataract surgery was as follows: The subjects' eyes were topically anesthetized using proparacaine hydrochloride 0.5% and dilated using tropicamide 1%. The patients in the alprazolam group were given an oral dose of 1 mg alprazolam about 1 hour before the scheduled surgery time. Intracameral anesthesia was achieved using 1% lignocaine. The procedure was carried out under aseptic measures by experienced surgeons using standard equipment and applying similar technique (stop and chop). Phacoemulsification time was defined as the time from the start of phacoemulsification (sculpting) till the removal of the last nuclear fragment with the phaco probe. An intraocular lens was implanted in the capsular bag and intracameral moxifloxacin was injected. Postoperatively the patients were treated with topical moxifloxacin 0.5% and prednisolone acetate 1% eyedrops every two hours for the first week. Oral mefenamic acid tablets were provided as needed for pain relief. Patients were assessed both preoperatively and on the first postoperative day before being discharged and given 1 week postoperative follow-up.

All patients underwent phacoemulsification cataract surgery under topical anesthesia performed by consultant ophthalmologists of similar surgical experience using standardized equipment and similar technique (stop and chop) in order to minimize any confounding factors. All surgeries went uneventful and no intra-operative or post-operative complications were encountered.

The outcome measure for this study was the mean phacoemulsification time, recorded in minutes, for both groups. Data were analyzed using IBM SPSS software (version 23). The mean phaco time between the two groups was compared using an independent samples t-test. A p-value of < 0.05 was considered statistically significant.

RESULTS

A total of 100 patients (94 females, 6 males) were included in the study, with 50 patients in each group. The mean age of participants was 63.1 ± 7.51 years. There were no significant differences between the two groups in terms of age or gender distribution (Table I).

Table I: Age and gender distribution

Demographics	Alprazolam Group (n=50)	Control Group (n=50)
Mean Age (years)	63.38 ± 5.90	62.82 ± 8.89
Gender (M/F)	3/47	3/47

The mean phacoemulsification time in the alprazolam group was significantly shorter as compared to the control group. In Group A (Alprazolam), the mean surgery time was 4.74 ± 2.09 minutes, whereas in Group B (Control), the mean surgery time was 7.84 ± 2.42 minutes. The mean difference was compared between the two groups using an independent samples t-test, which was statistically significant, with a *p*-value of less than 0.01.

Table II : Mean Phacoemulsification Time

	Alprazolam Group	Control Group	*p*-value
Mean Phacoemulsification Time (minutes)	4.74 ± 2.09	7.84 ± 2.42	<0.01

DISCUSSION

This study sought to determine whether the administration of preoperative alprazolam, a benzodiazepine is known for its anxiolytic and sedative properties could reduce phacoemulsification time in cataract surgery by mitigating patient movement and anxiety. The results demonstrate a statistically significant reduction in mean phacoemulsification time in the group receiving preoperative alprazolam compared to the control group, supporting the hypothesis that sedation enhances surgical efficiency. These findings are consistent with previous studies showing that anxiolytic medications improve intraoperative conditions by reducing patient anxiety and physical movement.[7]

In this study, patients who received alprazolam were found to be more relaxed, which likely led to fewer involuntary movements, such as head tremors or muscle twitches. These movements can occur due to anxiety, and in elderly populations, conditions like essential tremors are more common[8] which can exacerbate difficulties during surgery. By alleviating both anxiety and physical restlessness through its physiological and psychological effects, alprazolam created a more controlled operative environment, allowing the surgeon to complete the phacoemulsification process more efficiently.

Moreover, it is well-established that cataract surgery involves fine, delicate movements under a microscope, with high precision required to break up and remove the lens using ultrasonic energy. Any interruption due to patient movement requires the surgeon to pause, refocus, and readjust, thereby prolonging the procedure. Our findings suggest that sedation prevents these interruptions, reducing the need for such pauses and adjustments, which translates into shorter overall surgery time.

Previous studies in cataract surgery have examined various methods to improve patient cooperation and reduce surgery times. For example, conscious sedation using midazolam, another benzodiazepine did not enhance patient comfort or reduce anxiety during cataract surgery.[9] In addition its prolonged effects postoperatively also made it unsuitable for shorter surgeries.[10] However, alprazolam, being an oral agent with a rapid onset of action and relatively short half-life, offers a practical and non-invasive alternative to intravenous sedatives like midazolam.[11]

The results of our study align with findings in other surgical fields where preoperative anxiety reduction leads to more favorable intraoperative conditions.[12] Not only this, but preoperative anxiety played a significant role in patient experience postoperatively as well.[13,14] However, there is relatively limited research specifically focusing on the use of preoperative alprazolam in ophthalmology. This study contributes to the growing body of evidence that oral sedatives can enhance the operative environment, particularly in precision-based surgeries like phacoemulsification.

The reduction in surgery time observed in this study carries several important clinical implications. Shorter surgeries are generally associated with a reduced risk of intraoperative complications, such as corneal endothelial damage, fluid mismanagement, or inadvertent trauma to ocular structures.[15] Phacoemulsification is energy-dependent, and prolonged surgeries often require higher cumulative energy levels, which can contribute to postoperative inflammation or corneal swelling.[16] By reducing the surgery time, the amount of energy delivered to the eye is likely minimized, potentially leading to better visual recovery and fewer postoperative complications.

Additionally, shorter surgery times improve the efficiency of the operating room, allowing more patients to be treated within the same time frame. This is particularly relevant in high-volume ophthalmic centers, where optimizing surgical throughput can significantly improve patient access to care and reduce waiting times for elective surgeries. Moreover, shorter

surgical duration and subsequently higher surgical volume is also economically advantageous as it can reduce overall healthcare costs, making this a potentially cost-effective intervention.[17]

While we did not formally assess patient satisfaction in this study, anecdotal reports from both patients and staff suggested that the alprazolam group appeared more comfortable and cooperative during the procedure.

While this study provides compelling evidence for the use of preoperative alprazolam, several limitations should be considered. First, the sample size was relatively small, which may limit our ability to generalize the findings. A larger study population would provide more robust data and allow for subgroup analyses, such as assessing the effects of alprazolam in patients with high preoperative anxiety versus those with lower anxiety levels. While every effort was made to include cataracts of similar grade, we acknowledge that grading of the cataracts was subjective at best and therefore served as a confounding factor.

Furthermore, this study had a significant gender bias (females 94; males 6). However, this difference proved advantageous for our study as it has been demonstrated that females are more prone to anxiety disorders in general and pre-operative anxiousness in specific.[18,19]

Additionally, we did not measure postoperative recovery time or complication rates in detail, which could be important secondary outcomes in future research. While no significant intraoperative complications were observed, a more comprehensive analysis of postoperative outcomes, including visual acuity, corneal edema, and patient-reported satisfaction, would further elucidate the broader benefits of preoperative alprazolam use.

Future studies could explore the impact of different doses or types of sedatives on cataract surgery outcomes, as well as examine the long-term benefits of reduced surgery time, such as improved postoperative recovery and visual function. It would also be valuable to conduct a cost-benefit analysis of using alprazolam routinely in cataract surgeries to assess whether the reduction in surgery time and potential improvement in outcomes justify the additional cost of preoperative sedation. Additionally, exploring the use of preoperative alprazolam in more complex cataract surgeries, such as cases with denser cataracts or patients with comorbidities, could further expand its clinical application.

CONCLUSION

This study demonstrates that preoperative administration of alprazolam significantly reduces phacoemulsification time in cataract surgery, likely due to its ability to reduce anxiety and patient movement during the procedure. The use of conscious sedation in routine cataract surgeries may improve surgical efficiency, reduce complications and enhance the overall patient experience.

CONFLICT OF INTEREST

None.

SOURCE OF FUNDING

None.

ETHICAL STATEMENT

All subjects gave their informed consent for inclusion before they participated in the study. All procedures performed in this study involving human participants were conducted ethically according to the ethical standards of the Ethical Review Board of Fauji Foundation Hospital Rawalpindi (vide letter no. 850/RC/FFH RWP dated 20/06/2024).

Authors' Contributions:

Wali Waqar Qureshi: Conception of study/Designing/ Planning, Experimentation/Study Conduction, Analysis/Interpretation/Discussion, Manuscript Writing, Critical Review, Facilitated for Reagents/Material Analysis

Maham Fazal: Experimentation/Study Conduction, Analysis/Interpretation/Discussion, Manuscript Writing

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A RARE CASE OF SYSTEMIC LUPUS ERYTHEMATOSUS IN A MALE PATIENT ASSOCIATED WITH ANTIPHOSPHOLIPID SYNDROME, PRESENTING WITH SEVERE AUTOIMMUNE HEMOLYTIC ANEMIA

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ABSTRACT

This case report describes an unusual case of Systemic Lupus Erythematosus (SLE) in a male patient associated with antiphospholipid syndrome who presented with recurrent episodes of jaundice secondary to severe autoimmune hemolytic anemia. SLE is rare in males and very few cases have been reported so far. Our patient was a middle-aged gentleman diagnosed case of SLE, presented with fatigue, generalized weakness and shortness of breath. He also had multiple episodes of jaundice. Diagnostic workup confirmed autoimmune hemolytic anemia, that was refractory to steroid therapy and Azathioprine, but responded to IV methylprednisolone and Mycophenolate. The antibodies for antiphospholipid syndrome were also positive. Although lupus and antiphospholipid syndromes are rare in males, these entities should be considered especially among those with unexplained anemia and hemolysis.

Keywords: *Antiphospholipid Syndrome, Autoimmune Hemolytic Anemia, Immunosuppression, Systemic Lupus Erythematosus*

INTRODUCTION

Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disorder affecting various body organs. The etiology has been attributed to environmental, genetic and idiopathic factors. The condition involves inflammatory process which leads to activation of autoimmunity in body leading to a wide spectrum of clinical presentation that may vary from a mild disease to severe fatal organ involvement.[1] Female gender, identical twins and genetic conditions like Klinefelter's syndrome have more predisposition to the development of SLE. Various medication like Procainamide, Hydralazine, Isoniazid have been found to be linked with drug induced SLE. Environmental factors include viral infections, sunlight exposure and vitamin D deficiency.[2] Diagnosis of lupus requires clinical symptoms as well as laboratory tests particularly autoimmune profile. According to the diagnostic criteria by the European Alliance of Associations for Rheumatology (EULAR)/American College of Rheumatology (ACR) in 2019 auto antibody positivity is required with anti-nuclear antibody (ANA) in majority of the patients however this antibody is less sensitive and is even found in healthy individuals. Some patients with SLE have negative ANA antibody so extractable nuclear antibody particularly anti double stranded DNA (anti- ds DNA) is used, which is more specific and also provides information regarding disease activity. Other auto antibodies like anti SS-A, SS-B and anti-RNP antibodies can also be present in patients with SLE. Treatment of lupus is aimed at reduction of the symptoms to minimum, prevention of acute flares and acquire disease remission.[3]

Antiphospholipid antibody syndrome (APS) is a chronic autoimmune disease mediated by the antibodies that target membrane surface phospholipids. This in turn leads to a spectrum of clinical manifestations including arterial and venous thrombosis along with the multi system involvement. The condition has been linked with other autoimmune disorders especially lupus and the diagnosis involve detection of antibodies including anticardiolipin, anti-phospholipids, Anti-beta

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Received: 16 Apr 2025; revision received: 13 May 2025; accepted: 29 May 2025

2 glycoprotein antibodies and lupus anti coagulant.[4] SLE has been found to be associated with antiphospholipid syndrome and other autoimmune disorders. Interestingly, patients suffering from SLE and associated antiphospholipid syndrome who develop autoimmune hemolytic anemia as complication are more prone to develop thrombosis[5] highlighting the timely recognition of these associated medical disorders. SLE is more common in females and the purpose of presenting this case was the fact that our patient was male with SLE and antiphospholipid syndrome who presented with severe autoimmune hemolytic anemia that was refractory to corticosteroid therapy.

CASE REPORT

A 37 years old gentleman already diagnosed as a case of SLE in July 2021 on the basis of symptoms and biochemical parameters and was prescribed low dose hydroxychloroquine that improved his joint pains and rashes, now presented to the medical outpatient department in a tertiary care hospital with history of vomiting, lethargy and reduced appetite for the last one week. The vomiting which started a week ago, was sudden in onset, non-projectile, not associated with abdominal pain or fever. Vomitus contained food particles and he experienced multiple episodes over the past 48 hours. There was associated lethargy and reduced appetite. Anorexia and vomiting were likely related to gastritis as he was taking hematinic and anticoagulant since 2021. The systemic inquiry revealed history of joint pains, rashes, photo sensitivity to sunlight. There was no history of weight loss or bleeding from any site. There was no history of any surgical intervention in the past however there was history of multiple blood transfusions. There was history of deep venous thrombosis (DVT) of his left leg in 2021 for which he was given anticoagulant therapy with oral Rivaroxaban in a therapeutic dose for 3 months followed by a prophylactic dose of 10mg daily that was continued. He also revealed the history of chronic headaches and numbness in the body. He also revealed progressive lethargy and history of multiple hospital visits due to anemia.

On examination, he was pale as well as jaundiced. His temperature was 98.6^{0}F. His pulse was 110/min, respiratory rate 16/min and blood pressure was 105/60 mm Hg. Abdominal examination revealed splenomegaly. There was no clinical suspicion or findings of thrombosis in his recent admission.

His laboratory workup showed the presence of autoimmune hemolytic anemia. In his current admission, the lab tests showed marked anemia with hemolysis as evident in table I given below. Serum bilirubin, LDH and reticulocyte count were elevated however serum ALT, AST and ALP were within the normal limits. Renal parameters including serum urea and creatinine were also normal. Rheumatology consultation was sought and complete autoimmune profile including ANA and ENA was done as shown in table II. ENA (Extractable nuclear antigen) test was positive for lupus (positive ANA and anti-double stranded DNA) while the rest of the ENA antibodies were negative. Test for antiphospholipid antibodies was also done that showed positive lupus anticoagulant, positive anticardiolipin antibodies and positive anti beta 2 glycoprotein 1 antibodies with high titer (table II). The oral course of Prednisolone was given in a dose of 1mg/kg/day for 4 weeks that was gradually tapered. Azathioprine was also started along with oral hematinic, however there was no significant improvement in his anemia over a period of time.

Following no improvement, he was admitted and IV methylprednisolone along with Mycophenolate mofetil was instituted, which resulted in a significant improvement in hemoglobin and bilirubin levels as can be seen in table II.

He was discharged on oral Prednisolone, Mycophenolate mofetil, Rivaroxaban, PPI then followed up fortnightly regularly in OPD. The compliance to treatment was good and the repeat tests showed good sustained response without any further fall in hemoglobin levels. There was no limitation during the management as he was an entitled patient in that institution.

Table I: Complete Blood counts

Parameter	Normal range	Before Methylprednisolone and MMF therapy	After Methylprednisolone and MMF therapy
WBC	4000-11,000/ul	4650	6650
RBC	3.8-5.8 m/ul	2.8	3.5
Hb	11.5-16.5 g/dl	8.8	10.1
Platelets	150,000-450,000	100,000	140,000
MCV	76-96 fl	104	95
MCH	27-33pg	31	32
MCHC	32-38 g/dl	29	33
Reticulocytes	0.5- 2 %	9.5	2.5

Table II: Autoimmune profile / Chemistry

Test	Result	Normal value
ANA	Positive	Negative
Anti-ds DNA Ab	Positive	Negative
Alegria Antiphospholipid Ab panel (IgM)	10.0	<10
Alegria Antiphospholipid Ab (IgG)	>80	<10
Coombs test	+ve	-ve
LDH	558	135-225U/L
Anti RNP Ab	2	<5
Total Bilirubin	4.05	0.1-1.2mg/dl

DISCUSSION

SLE and anti-phospholipid syndrome are often associated together as both are autoimmune mediated and are primarily seen in females. Both the conditions when coexist together lead to an increased propensity to develop complications particularly thrombosis.[6] Suzuki E et al. found mixed type autoimmune hemolytic anemia in a female patient with SLE and antiphospholipid syndrome[7] that highlights the importance of evaluation of these three conditions in a patient with unexplained anemia. The hemolytic anemia in these conditions usually resolves to steroids however we often see refractory cases that may require immunosuppressive agents and intravenous immunoglobulins. Our patient was a young male who had SLE with antiphospholipid syndrome with severe refractory autoimmune hemolysis. It is described that out of 10 cases of SLE, only one will be male whereas nine will be females.[8] Antiphospholipid syndrome often remains undiagnosed in males and this case highlights the importance of suspecting these autoimmune conditions in males. A single center retrospective study conducted at University college London hospital found that in patients with Antiphospholipid syndrome, the presence of concomitant SLE does not appear to increase the risk of thrombotic complications[9] however various other studies showed that patients with SLE and associated antiphospholipid syndrome who have autoimmune hemolytic anemia are more prone to develop thrombotic complications. A study conducted in Khairpur, Pakistan compared the different modalities of treatment in patients with autoimmune hemolytic anemia that showed more aggressive and longer duration of therapy is required in secondary AIHA as compared with primary AIHA.[10] In refractory cases, combination therapies should be preferred over steroid alone treatment as in our case the dual therapy was effective. For more severe and life-threatening cases, IVIG can be considered. Studies have highlighted various ongoing trials on monoclonal antibodies and newer modalities of treatment for autoimmune hemolytic anemia[11] and we hope they would be helpful in reducing the thrombotic complications as well. Future multi centric larger studies are required for better assessment of the thrombotic risk in these autoimmune mediated disorders.

CONCLUSION

Any male patient with SLE and coexisting antiphospholipid syndrome who presents with unexplained anemia should be evaluated for associated autoimmune hemolytic anemia. People with antiphospholipid syndrome are more prone to thrombosis and the chances of thrombosis are more when these patients have associated autoimmune hemolytic anemia.

Authors' contributions:

Nimra Riaz: Conception of study/Designing/Planning, Manuscript Writing, Data Collection, Critical Review

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CONFLICT OF INTEREST

None.

SOURCE OF FUNDING

None.

ETHICAL STATEMENT:

Ethical approval obtained from ethical review board # PHGI-IRB (DME)-RCD-06-054 dated 07/11/2024 and written consent taken from the patient.

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CASE REPORT

HIGH MYOPIA OF -26D IN A 3 YEAR OLD CHILD: A RARE CASE PRESENTATION

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ABSTRACT

High myopia in early childhood is rare and often associated with genetic, ocular, or systemic abnormalities. This case report describes a 3-year-old girl diagnosed with high axial myopia (-24.00 DS) and an axial length exceeding 33 mm, highlighting the importance of early detection and comprehensive management. A 3-year-old female presented with squinting and difficulty seeing distant objects. Cycloplegic refraction revealed -24.00 DS in both eyes, with no nystagmus or strabismus. Examination under anesthesia confirmed -26.00 DS on retinoscopy. Ocular examination was remarkable for severe chorioretinal atrophy and pale optic discs (0.5 CDR). Axial length measurements were 33.23 mm (right eye) and 33.15 mm (left eye). A diagnosis of high axial myopia was made, and myopia management was initiated with spectacle correction, soft contact lenses, and low-dose atropine therapy (0.01%). Systemic evaluation ruled out syndromic associations, and the patient was placed on close follow-up for progression monitoring and amblyopia management.

This case represents one of the highest reported myopic refractive errors in early childhood. It highlights the importance of early detection, individualized myopia management, and long-term monitoring to reduce the risk of progressive vision loss and complications. Advances in myopia control offer promising avenues for improving visual outcomes in highly myopic children.

Keywords: *High Axial Myopia, Early-onset Myopia, Pediatric Myopia, Refractive Error, Axial Length*

INTRODUCTION

Myopia is a common cause of decreased vision and uncorrected myopia is the leading cause of distance vision impairment globally. It is estimated to affect 2.6 billion people globally[1] and affects approximately one-third of children and adolescents globally, with considerable variation in prevalence rates across different demographic and ethnic groups, the highest rates reported for East Asian children (35.22%).[2] However, the prevalence of high myopia (> 6 diopters) is relatively low (0.03-0.2%) in children and can be linked to environmental factors such as prematurity and genetic factors.[3]

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Received: 12 Mar 2025; revision received: 23 Apr 2025; accepted: 29 May 2025

Early onset high myopia can be isolated or syndromic (associated with ocular or systemic features). Systemic disorders such as Marfan syndrome, Stickler syndrome, Noonan syndrome, Weill-Marchesani syndrome, and homocystinuria, and Down syndrome and ocular disorders such as congenital glaucoma and retinopathy of prematurity are associated with secondary myopia.[3] The impact on visual development can be profound, as uncorrected myopia in this critical period may lead to amblyopia, strabismus, anisometropia, retinal abnormalities or impaired binocular vision.[4] Unlike physiologic myopia, pathologic or high myopia in children is persistent and progressive necessitating early diagnosis, complete ophthalmological and systemic examination and timely intervention as delayed correction of significant refractive errors in early childhood can result in long-term visual deficits. High myopia in children is not well documented in the literature. In a population survey of 728 children ages 6 to 7 years old, the most myopic cycloplegic refraction

was −5.0 D, with no children identified with high myopia.[5] There is a paucity of data in literature on highest myopia in early childhood. To the best of our knowledge, there are no reported cases of high myopia in childhood in Pakistani population. This case report presents a unique instance of early childhood high myopia, emphasizing the importance of early detection, comprehensive evaluation, and appropriate management to prevent long-term visual impairment.

Case presentation

A 3-year-old girl presented to our clinic with complain of decreased vision for far. Her mother reported that she squints her eyes when watching TV and brings objects very close to eyes to see clearly.

She was born at 38weeks gestation with no complications. There was no developmental delay and she could talk and walk appropriate for her age. Her medical and ocular history were both unremarkable. Both her mother and father are moderate myopes with no other remarkable ocular history.

Ophthalmologic examination recorded a visual acuity of 6 cpcm. Cycloplegic refraction done after instilling 1% cyclopen revealed a refractive error of -24DS in both eyes. There was no nystagmus or strabismus. An ocular examination under anesthesia was conducted that recorded a refractive error of -26DS on retinoscopy. Her anterior segment assessment was unremarkable for both eyes however dilated fundus exam revealed generalized severe chorioretinal atrophy and pale discs of 0.5 CDR with peripapillary atrophy. K readings were 42.75 and 43.5, 42.5 and 43.0 in right and left eyes respectively.

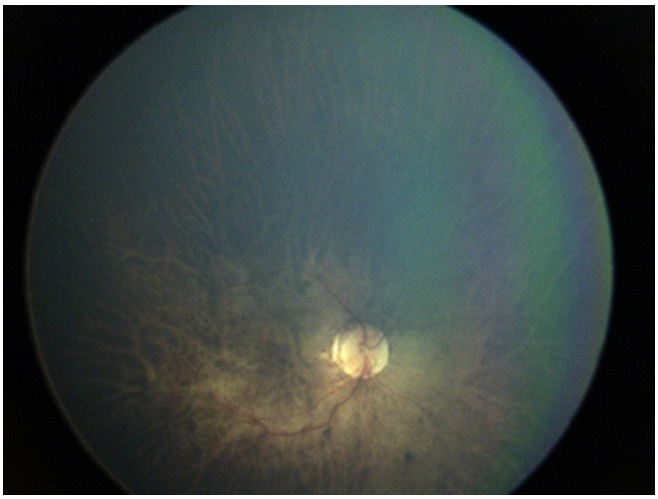

Figure 1: Fundus photograph of right eye

Note: Generalized severe chorioretinal atrophy and disc palor are visible.

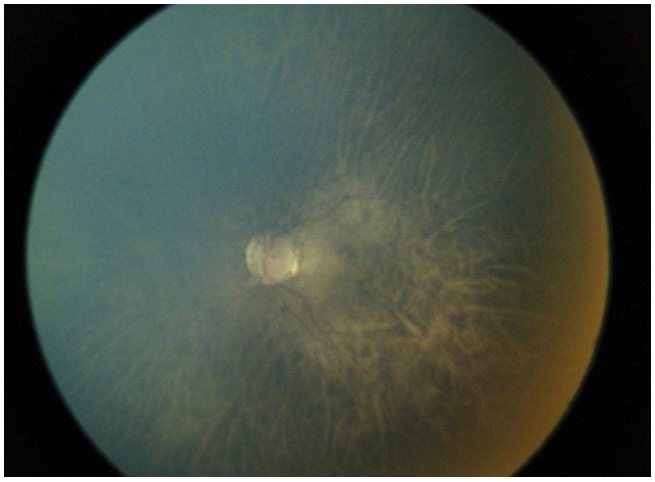

Figure 2: Fundus photograph of left eye

Note: Generalized severe chorioretinal atrophy and slightly pale disc with peripapillary atrophy are visible.

Corneal diameters were 11 mm vertical and 12 mm horizontal in both eyes. IOP was measured by Perkins as 18 mmHg in both eyes. Axial length was 33.23mm in right eye and 33.15 mm in left eye, recorded on A-scan.

A diagnosis of high axial myopia was made and myopia management including soft contact lenses, spectacle correction and low dose atropine was offered to the patient. She was referred to a paediatrician for systemic examination for associated syndromes but that was found to be unremarkable. She is kept on close follow-up to monitor for progression and treatment of amblyopia.

DISCUSSION

The prevalence of myopia is increasing by each passing year and it is now considered an urban epidemic. Projections suggest that by 2050, nearly 50% of the world's population will be myopic, with a substantial proportion experiencing high myopia.[6] High myopia in early childhood is more commonly secondary while in older children it is rapidly progressive axial myopia, hence high myopia in early ages necessitates intensive investigation to rule out underlying genetic, ocular or systemic causes. Myopia of prematurity (MOP) is present in 19% of eyes with any degree of ROP (Retinopathy of Prematurity) and only 6% in eyes without ROP.[7] It has specific biometric features that differ from typical myopia, specifically steeper corneas, shallower anterior chambers, thicker lenses, and shorter axial lengths than full-term infants.[8] High myopia can be polygenic with influence of environmental factors like near work, or monogenic. Monogenic forms of myopia are categorized into four groups: ametropic retinal dystrophies; connective tissue disorders; monogenic

isolated high myopia; and other disorders.[3] The case of a 3-year-old girl with a refractive error of -26.00 diopters (D) and axial lengths exceeding 33 mm underscores the critical need for early detection and comprehensive management strategies. The presence of nystagmus alongside high myopia may indicate an underlying retinal dystrophy. A thorough clinical evaluation can help identify associated conditions. Examining the cornea, iris, anterior chamber, and lens can reveal keratoconus, transillumination defects (suggestive of albinism), anterior lens dislocation, microspherophakia, or lenticonus. Vitreous abnormalities, such as the membranous or beaded appearance seen in Stickler syndrome, can also aid diagnosis. Retinal examination is crucial for detecting inherited retinal diseases or signs of neonatal interventions for retinopathy of prematurity (ROP) that may not be evident from patient history. In older children with high myopia, optic nerve changes, myopic maculopathy, and posterior staphyloma may be observed, which can have long-term implications for visual health. Early and effective management is crucial to slow the progression of myopia and mitigate associated risks. Traditional single-vision lenses correct refractive errors but do not control myopia progression. However, specialized lenses like the MiYOSMART lens, which incorporates Defocus Incorporated Multiple Segments (DIMS) technology, have shown a 60% reduction in myopia progression in children aged 8 to 13 years.[9] Orthokeratology (Ortho-K) lenses temporarily reshape the cornea to reduce refractive errors and have been associated with a 50% reduction in myopia progression.[10] Additionally, bifocal and multifocal soft contact lenses have shown promise in slowing myopia progression. Low-concentration atropine (0.01%) has been effective in slowing myopia progression with minimal side effects.[11] The exact mechanism remains unclear, but it is hypothesized to involve modulation of biochemical pathways influencing eye growth. Studies have demonstrated that increased time spent outdoors is associated with a reduced incidence of myopia. Exposure to natural light and engagement in distance-viewing activities are believed to play protective roles. Limiting continuous near tasks and encouraging regular breaks can help mitigate myopia progression.[12] Regular follow-up is essential to monitor axial length, refractive status, and ocular health. Early intervention and adherence to management strategies can significantly reduce the risk of sight-threatening complications. However, high axial myopia diagnosed at such a young age requires vigilant monitoring due to the potential for rapid progression.

CONCLUSION

In conclusion, this case is the highest recorded high myopia in a child. It underscores the importance of early detection and a multifaceted approach to managing high axial myopia in young children. Combining optical, pharmacological, and lifestyle interventions offers the best chance to slow myopia progression and preserve visual function. Ongoing research and advancements in myopia control strategies hold promise for more effective management in the future.

CONFLICT OF INTEREST

None.

SOURCE OF FUNDING

None.

ETHICAL CONSIDERATIONS

This study was conducted according to the guidelines of ethical committee of Al-Shifa Trust Eye Hospital, Rawalpindi. Informed consent was obtained from the parents of the patient before enrollment in the study. Confidentiality and patient anonymity were strictly maintained throughout the research process.

Authors' Contributions:

Shafaq Najmi: Conception of study/Designing/Planning

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Nusrat Sharif: Analysis/Interpretation/Discussion

Aunaiza Maqbool: Critical Review

Fauzia Naureen: Facilitated for Reagents/Material Analysis

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CASE REPORT

MANAGING EMERGENCY NON-CARDIAC SURGERY IN A PEDIATRIC PATIENT WITH MOST SEVERE CYANOTIC HEART DISEASE: A CASE STUDY

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ABSTRACT

Anesthesia for congenital heart disease patients undergoing noncardiac emergency surgery presents significant challenges due to complex anatomical and physiological abnormalities, requiring tailored interventions to maintain hemodynamic stability. Anesthetists need to be knowledgeable not only about the normal series cardiac circulation but also the parallel (or balanced) and single-ventricle circulations. Providing anesthesia to pediatric patients with congenital heart anomalies during procedures unrelated to the heart involves a range of specialized considerations and remains a complex aspect of perioperative care. Multiple factors contribute to the complexity of anesthetic management in children with congenital heart disease, such as the patient's age, nature and extent of the cardiac abnormality, hemodynamic compensation, surgical urgency, and any coexisting health issues. This case discusses the anesthetic management of an 8-year-old boy with congenital heart disease and severe pulmonary hypertension undergoing emergency laparotomy. It addresses perioperative challenges and provides an overview of pediatric pulmonary hypertension physiology, risk stratification, and intraoperative considerations.

Keywords:

Cyanotic Heart Disease, Non-Cardiac Surgery, Pediatric Surgery

INTRODUCTION

Congenital heart disease (CHD) occurs in approximately 0.6% of newborns, with its incidence remaining stable over time.[1] Improvements in surgical and medical treatments have primarily shifted mortality to adulthood. The population of adults with CHD is steadily growing, with the exception of those with Eisenmenger syndrome and unrepaired cyanotic defects.[2] Pediatric pulmonary hypertension is a multifaceted condition with a range of causes, affecting everyone from premature infants to young adults. The most commonly addressed form is pediatric pulmonary arterial hypertension, whether idiopathic or associated with congenital heart disease, due to its progressive and often fatal course.[3] In individuals with complex congenital heart defects, such as pulmonary atresia-ventricular septal defect and single-ventricle anomalies, pulmonary hypertension may affect up to 49.7% by the age of 40.[4] Pulmonary hypertension (PH) in congenital heart disease (CHD) with biventricular physiology is diagnosed when the mean pulmonary artery pressure exceeds 25 mmHg and pulmonary vascular resistance exceeds 3 Wood units. Anesthesia for CHD patients undergoing non-cardiac surgery should be individualized, with induction and maintenance techniques adapted to the child's unique condition and the specifics of the procedure.

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Received: 27 Jan 2025; revision received: 04 Jun 2025; accepted: 12 Jun 2025

Case Report

An 8-year-old boy (weight: 20 kg, height: 114 cm, BMI: 15.39 kg/m²) presented with a 3-day history of abdominal pain and bilious vomiting (8 episodes in one day). His medical history included cyanotic congenital heart disease (CHD) with bilateral Glenn shunts inserted 2.5 years ago, which remained functional as per recent echocardiography findings. The echo showed a single functioning right ventricle (RV), single atrium, moderate tricuspid regurgitation (TR), a non-functional compressed left ventricle (LV), pulmonary artery pressure (PAP) of 74 mmHg, and a double outlet RV. His medications included sildenafil (50 mg twice daily) and bosentan (62.5 mg twice daily).

The patient's baseline peripheral oxygen saturation

(SpO_2) was 56% on room air. He had clubbed fingers and secondary erythrocytosis (hemoglobin: 192 g/L, hematocrit: 0.68) with mild leukocytosis (10.65×10^9/L) and elevated C-reactive protein (42.9 mg/L). Abdominal ultrasound revealed a heterogeneous lesion adjacent to the small bowel, cystitis, and bilateral hydroureter. A contrast-enhanced CT scan confirmed small bowel torsion, suggesting malrotation and volvulus, necessitating emergency surgical intervention.

The patient underwent preoperative counseling for high-risk non-cardiac abdominal emergency surgery (ASA status IV-E). High risk consent was taken from the parents. In the operating room, standard anesthesia monitoring (ECG, pulse oximetry (pre ductal & Post ductal), non-invasive BP, temperature) was initiated, and an arterial line was inserted before induction. Vital signs included a temperature of 36.5°C, heart rate of 86 beats/min, BP of 100/69 mmHg, and respiratory rate of 19 breaths/min. Pre-induction SpO_2 ranged between 56-65%. Arterial blood gas analysis revealed a pre-induction partial pressure of oxygen (PaO_2) of 48 mmHg.

Anesthesia induction included pre medication with midazolam 0.05mg/kg (1 mg), analgesia with ketamine 0.25mg/kg (5 mg) and inf Acetaminophen 15mg/kg for analgesia, induction with inj propofol 2mg/kg (40 mg), and muscle relaxant cis-atracurium 0.15mg/kg (3 mg). Intubation was performed with a size 5.5 cuffed endotracheal tube confirmed with bilateral auscultation and capnography. Intraoperative anesthesia was maintained with sevoflurane and 100% oxygen. Cis-atracurium was administered as needed by monitoring train of four via Nerve Stimulator, and fluid management included 1 liter of Ringer's lactate after calculating (NPO deficit, maintenance fluid, intra opt blood loss and 3rd space loss). The patient remained hemodynamically stable with an estimated blood loss of 200 mL, except for an arrhythmia managed with lignocaine (1 mg/kg). Intraoperative PaO_2 was 50 mmHg.

Surgical findings included splenic torsion, malrotation of the gut, and a congested spleen, necessitating splenectomy and widening of the small bowel mesentery. The procedure lasted 2.5 hours, after which the patient was shifted to the surgical ICU on spontaneous ventilation with FiO_2 100%.

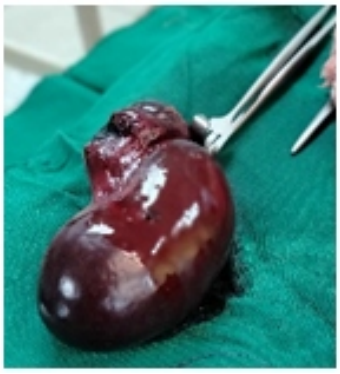

Figure 1: Showing the spleen that was removed

Table I: Intra-Op Vital Monitoring

Time	HR (bpm)	IBP(MAP) (mmhg)	SpO_2(%) FiO_2 =100	Temp °C	Urine output (ml) (0.5-1ml/kg/hr)	BSR	ABGs PaO_2 (%)
00 min	86	78	56%	36.5 °C	-		47.9%
15 min	88	77	60%	36.5 °C	-		
30 min	90	80	89%	37 °C	30ml	100mg/dl	
45 min	90	78	88%	36.5 °C	-		
60 min	101	76	88%	37.5 °C	40ml		50%
75	100	78	90%	36.5 °C	-		
90 min	104	74	90%	37 °C	-		
105	95	79	91%	36.5 °C	-		
120 min	92	65	93%	37 °C	85ml		
135 min	95	70	90%	36.5 °C	-		
150 min	110	60	89%	37.5 °C	90ml	120mg/dl	
SICU-	115	60	80%	37.5 °C		101mg/dl	

Postoperatively, sedation with dexmedetomidine, starting with a loading dose of 0.5 µg/kg followed by a maintenance infusion of 0.1 µg/kg/hr, titrated to maintain a MAP > 60 mmHg, pain management via caudal analgesia in immediate post opt period, and antibiotics (meropenem 400 mg and vancomycin 400 mg every 8 hours) were provided. Pulmonary hypertension medications (sildenafil and bosentan) were continued via nasogastric tube. The patient was successfully extubated after 24 hours with successful weaning trial, monitored for 72 hours, and discharged from the ICU in stable condition.

DISCUSSION

Advances in surgical techniques have enhanced survival rates for patients with univentricular physiology. As life expectancy increases, these patients may now present for non-cardiac surgeries.

The Glenn shunt is surgical interventions primarily used to treat congenital heart defects in individuals with single ventricle physiology. This procedure creates a shunt that connects the superior vena cava (SVC) to the pulmonary arteries, enhancing blood flow to the lungs and managing conditions where the heart's pumping ability is compromised. This arrangement allows deoxygenated blood from the upper body to reach the lungs for oxygenation directly, bypassing the heart.

Anesthetic management in patients with single-chamber hearts is particularly complex due to the risks associated with altered hemodynamics. The Glenn procedure facilitates drainage of the superior vena cava directly into the pulmonary arteries. This surgery significantly changes physiological dynamics and require thorough preoperative assessment and planning.

It is commonly accepted that patients with congenital heart disease undergoing noncardiac procedures are at a higher risk of perioperative cardiac arrest, major complications, and mortality compared to those without congenital heart disease. Children and adults with complex congenital heart disease undergoing noncardiac surgery are at an increased risk of complications and mortality during the perioperative period. Key factors influencing this risk include the type and urgency of the procedure, as well as any underlying comorbidities.[5]

Patients with complex congenital heart defects undergoing noncardiac surgery are more vulnerable to perioperative complications, particularly when risk factors such as baseline cyanosis, signs of congestive heart failure, and poor overall health are present.[6] Consequently, these patients necessitate detailed preoperative assessments, a deep understanding of their intricate physiology, and a collaborative care team to ensure optimal perioperative management and outcomes.

In cases like this, it is crucial to monitor cardiac output and ensure stable hemodynamics. Hemodynamic monitoring and appropriate fluid management are vital in optimizing outcomes for patients with single ventricle physiology. We employed continuous invasive monitoring to evaluate cardiac function during the procedure, allowing for the quick identification and correction of any deviations from baseline hemodynamics.

Considering the likelihood of pulmonary complications in individuals with congenital heart defects, we chose controlled ventilation to reduce intrathoracic pressure changes that could hinder venous return. Recent literature suggests that a balance of risk applies when targeting higher minute ventilation for carbon dioxide (CO_2) clearance, aiming to achieve normal pCO_2 and pH values, despite the necessary increase in the intensity of mechanical ventilation.[7] Utilizing low tidal volumes and suitable respiratory rates facilitated optimal oxygenation while reducing the risk of increase intrathoracic pressure and decrease CO.

Insufficient anesthesia or poor pain management can increase systemic vascular resistance (SVR), worsening left-to-right shunting as blood is diverted from the systemic circulation, which may ultimately impair cardiac output. Likewise, reduced cardiac output can result from decreases in venous return due to systemic hypotension or increased intrathoracic pressures.[8] Therefore, in our case, we administered Acetaminophen and ketamine for intraoperative pain relief to minimize the severe side effects linked to opioids, such as respiratory depression, sedation, nausea, vomiting, and delayed mobilization. A caudal epidural was given postoperatively to decrease opioid consumption and prevent respiratory depression as a side effect. Regional analgesia may also serve as a respiratory stimulant and is linked to a decreased need for mechanical ventilation.[9]

Postoperatively, our patient exhibited stable vital signs and satisfactory urine output, suggesting preserved renal function - an important factor, particularly in individuals with compromised cardiac output. Literature emphasizes that effective postoperative monitoring and

management can significantly reduce morbidity in this population.[10] Our patient was closely monitored in a Surgical intensive care unit (SICU) to manage any potential complications, such as arrhythmias or fluid overload.

CONCLUSION

In conclusion, anesthetic management for children with congenital heart defects, especially those with single-chamber physiology, demands careful planning and execution. The positive outcome of this case highlights the significance of personalized anesthetic strategies and collaborative teamwork. Future research should aim to explore long-term outcomes for this patient population as our understanding of congenital heart disease management advances.

CONFLICT OF INTERESTS

None

SOURCE OF FUNDING

None

ETHICAL STATEMENT

Ethical approval was obtained from Fauji Foundation Hospital Rawalpindi wide letter no. 877/RC/FFH/RWP dated 01/10/2024).

Authors' contributions:

Liaquat Ali: Conception of study/Designing/Planning, Critical Review, Material Analysis

Saima Zia: Experimentation/Study Conduction, Analysis/Interpretation/Discussion, Manuscript Writing

Huma Hanif: Experimentation/Study Conduction, Analysis/Interpretation/Discussion, Manuscript Writing

Umer Ali: Critical Review

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