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Books: Duke- Elder S, and Leigh AG: Diseases of the Outer Eye. Cornea and Sclera. In Duke-Elder S (ed): System of Ophthalmology, Vol. 8, Part 2. St. Louis C.V. Mosby Company, 1965, pp.110-114. (Recheck publisher, City, etc.).

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EDITORIAL

Implementing Workplace-Based Assessments in Ophthalmology: CPSP's Commendable Endeavor

Mahmood Ali

Assessment drives learning, a principle that underpins the recent efforts by the College of Physicians and Surgeons Pakistan (CPSP) in transforming post graduate training through Workplace-Based Assessment (WPBA). WPBA evaluates medical trainees directly within their clinical environments, ensuring that their skills are developed in real-world settings. CPSP has implemented a comprehensive WPBA program in Ophthalmology, incorporating Direct Observation of Procedural Skills (DOPS), Ophthalmic Clinical Evaluation Exercise (OCEX), and Ophthalmic Surgical Competency Assessment Rubric (OSCAR).

From January 2024 onwards, new residents are required to engage with WPBA tools, working with designated assessors according to a detailed curriculum timeline. Supervisors will organize assessment sessions, provide feedback, and create action plans, all documented through an online platform. The WPBA program covers various aspects of ophthalmology training:

- *Ophthalmic Clinical Evaluation Exercise (OCEX)* focuses on providing formative feedback and actionable improvement plans for various clinical encounters. Residents will undergo four exercises in the first two years.

- *Direct Observation of Procedural Skills (DOPS)* assesses specific procedural skills like foreign body removal, local anesthesia, and laser treatments, providing detailed feedback. Residents are expected to complete two DOPS each year, totaling eight over four years.

- *Ophthalmic Surgical Competency Assessment Rubric (OSCAR)* focuses on phacoemulsification, ensuring residents achieve competence in designated surgical steps of this important surgery over the first three years. Annual OSCAR assessments are conducted over the first three years.

Implementing WPBA poses certain challenges, including time constraints, resource limitations, and the need for faculty training. Clinical environments are often understaffed, making it difficult for faculty to devote time for comprehensive assessments and feedback. Additionally, WPBA requires faculty to develop new skills in assessment techniques and feedback methodologies.[1]

To address these issues, CPSP provides training modules and workshops for faculty members from time to time. An online portal has been introduced to streamline the recording and tracking of assessment data, reducing administrative burden and enhancing the quality of feedback. The college has provided flexible scheduling for these assessments. The trainee and supervisor can mutually agree on the day and time for conducting the assessment. Additionally, if the supervisor is unavailable or busy, they may delegate the session to another senior faculty member, or the trainee may request this arrangement. To ensure practicality and prevent an excessive workload, the number of required assessments has been kept attainable.

For WPBA to be effective, it must be integrated into the daily clinical workflow. Embedding assessment activities into routine patient care, such as using case discussions and bedside teaching as

evaluation opportunities, ensures that WPBA becomes a natural part of medical training.

The implementation of WPBA in Ophthalmology presents significant challenges; however, it offers a promising avenue for the enhancement of training and the improvement of patient care. Addressing these challenges requires innovative solutions and a commitment to integrating WPBA into clinical practice. Further suggestions for enhancing WPBA include increasing support for faculty development, leveraging technology for efficient assessment processes, and fostering a culture that values continuous feedback and improvement. By refining these strategies, WPBA can become a cornerstone of competency-based medical education.

Reference:

1. Liu C. An introduction to workplace-based assessments. Gastroenterol Hepatol Bed Bench. 2012 ;5(1):24-8.

ORIGINAL ARTICLE

Effect of 0.1% Nepafenac Eye Drops on Macular Thickness After Uneventful Phacoemulsification Assessed By Optical Coherence Tomography

Anushka Shaukat[1], Muhammad Azam Khan[1], Ayisha Shakeel[1], Irfan Aslam Khattak[1], Maria Saleem[1], Huma Zainab[2]

Abstract:

Objective: To compare mean macular thickness after uneventful phacoemulsification with 0.1% nepafenac eye drops using optical coherence tomography.

Methods: A sample size of 170 patients was calculated using the WHO calculator. Patients were divided into two groups; Group A was given 0.1% nepafenac while Group B was given a placebo. Patients were selected through nonprobability consecutive sampling. Patients were followed after uneventful phacoemulsification. OCT scan of macula was performed preoperatively and on day 7 and day 30. Data was analyzed using SPSS version 24, T-test was applied and a P value <0.05 was considered significant.

Results: A total of 170 patients were included in the study with 85 patients in each group. There were 42(24.7%) males in group A and 49(28.8%) in group B and 43(25.3%) females in group A and 36(21.2%) in group B. The mean age of patients in group A was 51.3±6.2 years and 49.8±6.3 years in group B. There was no statistically significant difference in macular thickness of Group A and Group B (215.5±1.0 and 215.6±0.9, p=0.546 respectively) before phacoemulsification surgery. However macular thickness was significantly lower in the nepafenac group, 7 days (220.1±2.4 vs 228.8±4.4, p=0.000) and 30 days postoperatively (217.6±1.6 vs 231.7±6.3, p=0.000).

Conclusion: 0.1% Nepafenac is a well-tolerated drug with a significant decrease in macular thickness as compared to placebo following uneventful phacoemulsification. Post-operative use of topical NSAIDs leads to the prevention of cystoid macular edema following cataract surgery. *Al-Shifa Journal of Ophthalmology 2024; 20(2): 48-55.*

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Introduction:

Pseudophakic cystoid macular edema (PCME) is one of the most common postoperative complications of cataract surgery. As the etiology is multifactorial, the incidence of PCME is variable and ranges from 1-30%[1]. Although most of the patients develop subclinical PCME with no effect on vision, some of the patients do develop poor central vision after an uneventful cataract surgery. It is therefore important to identify the risk factors at the time of planning cataract surgery so that

appropriate steps can be taken to prevent the occurrence of PCME[2].

The pathogenesis of PCME is unclear and multifactorial. The most probable etiology is the release of inflammatory mediators in anterior and posterior segments because of surgical insult causing blood-aqueous barrier and blood-retinal barrier to break down. This results in the accumulation of eosinophilic exudates within the retinal layers causing cystoid edema[3]. Certain risk factors are associated with developing PCME. The most common ones are surgical complications, Diabetes mellitus, uveitis, and use of prostaglandin analogs in glaucoma[4–6].

Several drugs have been used to prevent the occurrence of PCME after cataract surgery. Topical nonsteroidal anti-inflammatory drugs (NSAIDs) and corticosteroids have been used alone or in combination, to prevent and treat postoperative cystoid macular edema (CME). Corticosteroids inhibit the phospholipase A2 in the inflammatory cascade reducing the arachidonic acid production whereas the NSAIDs block the cyclooxygenases in the inflammatory cascade which blocks the production of prostaglandins[7]. Nepafenac, Bromfenac, and ketorolac are the NSAIDs that have been used to prevent PCME. Nepafenac has been used to prevent and treat PCME and its efficacy has been established[8]. Similarly, Bromfenac and Ketorolac have also shown promising results in the treatment of PCME[9,10]. However, there are a few studies that show no significant reduction in macular edema with the use of ketorolac and nepafenac[11,12].

The purpose of conducting our research was to find a solution to varying opinions about the use of NSAIDs in preventing PCME. We selected Nepafenac 0.1% for its ease of availability and comparatively lower cost in the pharmaceutical markets of Islamabad. The objective of this study is to compare the mean difference of macular thickness in patients using Nepafenac and Placebo using optical coherence tomography after uneventful phacoemulsification (Fig 1).

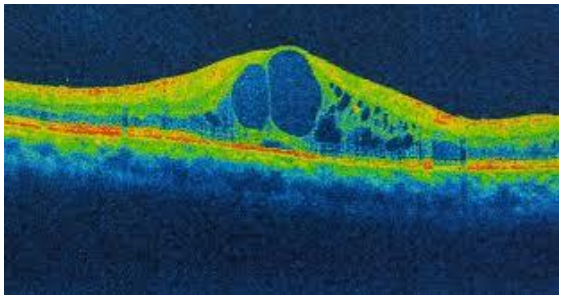

Figure 1: Cystoid Macular Edema

Material and Methods:

We performed a randomized controlled trial in the Department of Ophthalmology, PAF Hospital, Islamabad from 20th June 2022 to 20th December 2022. Ethical approval was obtained from the ethics review committee of the Institute. The study was conducted on a sample of 170 eyes which was calculated by the WHO sample calculator.

In this study, all male and female patients between the ages of 40 to 65 who were planned to have phacoemulsification with intraocular lens implantation were included. Patients with glaucoma, uveitis, retinal diseases, corneal diseases, epiphora, adnexal diseases, and systemic diseases like diabetes mellitus, hypertension, lung diseases, and cardiovascular diseases were excluded from the study. Also, patients with congenital anomalies of the eye and pregnant and lactating mothers were excluded from the study. Patients who initially were included in the study but had complicated phacoemulsification or prolonged surgery (more than 30 minutes) were also excluded.

After obtaining ethical approval, patients were selected through nonprobability consecutive sampling. Informed consent was taken from all the participants. A detailed history with a complete ophthalmic examination including visual acuity measurement, refraction (subjective and objective), slit lamp examination, tonometry, and fundus examination was performed. Patients underwent uneventful phacoemulsification with intraocular lens

implantation by a single experienced surgeon. Patients were divided randomly using computer computer-generated random number table. Group A was given 0.1% nepafenac topical drops three times a day while group B was given a combination of polyvinyl alcohol 1.4% and Povidone 0.6% (Placebo) with the same frequency. Both drugs were given for 30 days. Optical coherence tomography was performed before cataract surgery and after 7 and 30 days of cataract surgery. Image acquisition was done, and a macular thickness map was taken. The retinal thickness/volume was recorded after image capture to analyze the macular retinal thickness. Macular thickness in both groups was compared before phacoemulsification, and then 7 and 30 days after the surgery.

Data was collected and analysed through SPSS version 24. The quantitative variables like age and macular thickness were presented as mean and SD. The qualitative variables like gender, anatomical sides, and refractive error involved were presented as frequency and percentage. Mean macular thickness was compared in two groups by independent T-test. A p-value of ≤0.05 was taken as significant. Data was categorized for age, gender, anatomical side, and refractive error. Post-stratification, an independent sample t-test was applied for each stratum.

Results:

A total of 170 patients were included in the study with 85 in each group. Overall, there were 91(53.5%) male and 79(46.5%) female in our study. The mean age of patients in group A was 51.3±6.2 years and in group B was 49.8±6.3 years. Mean post-operative visual acuity in group A was 0.7 ±0.09 Log Mar and in group B 0.75±0.10 Log Mar as shown in Table 1.

Table 1: Demographic distribution

Group-wise distribution	Group A (nepafenac	Group B (placebo group)	Total Number (N=170)
Gender			
Male	42(24.7%)	49(28.8%)	91(53.5%)
Female	43(25.3%)	36(21.2%)	79 (46.5%)
Age category			
40-50 years	43(25.3%)	39(22.9%)	82 (48.2%)
51-65 years	42(24.7%)	46(27.1%)	88 (51.8%)
Anatomical side			
Left	32(18.8%)	29(17.1%)	61 (35.9%)
Right	53(31.2%)	56(32.9%)	109 (64.1%)
Refractive error			
Myopia	7(4.1%)	0(0%)	7 (4.1%)
Hypermetropia	42(24.7%)	43(25.3%)	85 (50%)
Astigmatism	36(21.2%)	42(24.7%)	78 (45.9%)
Descriptive Statistics			
Mean Age (Years)	51.3±6.2	49.8±6.3	
Post-op visual acuity (Log	0.7±0.09	0.75±0.10	

There was no statistically significant difference in macular thickness of Group A and Group B before surgery (215.5±1.0 and 215.6±0.9, p=0.546) respectively. However macular thickness was significantly lower in the nepafenac group after 7 days (220.1±2.4 vs 228.8±4.4, p=0.000) and 30 days postoperatively (217.6±1.6 vs 231.7±6.3, p=0.000) as shown in table 2.

Table 2: Comparison of macular thickness before surgery, 7 days, and 30 days after surgery

Macular thickness(µm)	Group A (Nepafenac group) N=85	Group B (Placebo group) N=85	P value
Before surgery	215.5±1.0	215.6±0.9	0.546
After 7 days of surgery	220.1±2.4	228.8±4.4	0.000
After 30 days of surgery	217.6±1.6	231.7±6.3	0.000

Table 3: Stratification of macular thickness concerning gender

Gender	Groups	Macular thickness before surgery	P value	Macular thickness after 7 days of surgery	P value	Macular thickness after 30 days of surgery	P value
Male	Group A	214.3±0.8	0.336	220.3±2.4	0.444	217.2±1.6	0.399
	Group B	215.3±0.8		221±2.5		220±2.0	
Female	Group A	216.9±0.9	0.339	221.3±2.5	0.468	221.3±2.5	0.432
	Group B	216.3±0.9		219.3±2.3		219.3±2.3	

Table 4: Stratification of macular thickness in both groups concerning age

Age	Groups	Macular thickness before surgery	P value	Macular thickness after 7 days of surgery	P value	Macular thickness After 30 days of surgery	P value
40-50 years	Group A	214.2±0.8	0.336	221.3±2.4	0.444	218.2±1.5	0.399
	Group B	215.1±0.8		220.2±2.5		220±2.0	
51-65 years	Group A	215.9±0.8	0.339	220.3±2.5	0.468	220.3±2.5	0.432
	Group B	216.3±0.9		221.3±2.3		219.2±2.3	

Table 5: Stratification of macular thickness in both groups concerning anatomical side

Anatomical side	Groups	Macular thickness before surgery	P value	Macular thickness after 7 days of surgery	P value	Macular thickness after 30 days of surgery	P value
Left	Group A	215.3±0.8	0.334	222.5±2.4	0.445	216.2±1.5	0.399
	Group B	215.1±0.8		220.2±2.5		219±2.0	
Right	Group A	215.9±0.8	0.339	221.7±2.5	0.467	221.3±2.5	0.431
	Group B	216.3±0.9		221.3±2.3		219.2±2.3	

Table 6: Stratification of macular thickness in both groups concerning refractive error

Refractive error	Groups	Macular thickness before surgery	P value	Macular thickness after 7 days of	P value	Macular thickness after 30 days of	P value
Myopia	Group A	215.3±0.8	0.334	222.5±2.4	0.445	216.2±1.5	0.399
	Group B	216.1±0.9		220.2±2.5		219±2.0	
Hypermetropia	Group A	219.2.9±0.8	0.339	221.7±2.5	0.467	221.3±2.5	0.431
	Group B	219.3±0.9		221.3±2.3		219.2±2.3	
Astigmatism	Group A	218.5±0.7	0.389	220.1±2.1	0.421	216.2±0.9	0.511
	Group B	217.2±0.7		221.2±2.2		219.1±0.8	

No statistically significant difference was found among macular thickness in both groups concerning gender, age, anatomical side and refractive error with p value >0.05.

Discussion:

PCME is a common cause of visual impairment after cataract surgery. Optical coherence tomography (OCT) has changed the way retinal diseases are seen and treated nowadays [13,14]. Most clinical trials have analyzed OCT measurements of macular thickness, including studies of CME after cataract surgery[15]. In the current study, there was no statistically significant difference in macular thickness of Group A and Group B (215.5±1.0 and 215.6±0.9, p=0.546) before surgery. However macular thickness is significantly lower in the nepafenac group 7 days after surgery (220.1±2.4 vs 228.8±4.4, p=0.000) and 30 days postoperatively (217.6±1.6 vs 231.7±6.3, p=0.000). This result corroborates with that of Tzelikis et al, who studied the use of NSAIDs prophylactically after uncomplicated cataract surgery. His study showed that incidence of macular edema

was significantly low in the group receiving Nepafenac compared with placebo[11]. This is similar to the results we achieved in our study.

On the other hand, a randomized study of 162 patients by Almeida et al produced different results. In this study there were three groups with 54 patients in each group. On group received 0.5% ketorolac eyedrops, the other received 0.1% nepafenac eye drops and the third group received placebo. The study found out that there was no statistically significant difference among the three groups in terms of macular thickness. In this study, all of the patients used the medication topically, starting on the day of phacoemulsification (preoperatively) and continuing with its use for 4 weeks[12]. Although there was a trend toward significance in both the nepafenac and ketorolac groups, statistical significance could not be found. The results of this study were different than ours due to a comparatively smaller sample size in each of the groups compared to our study which had a much larger sample size.

Our study has produced similar results to two other studies by Hariparsad et al and an earlier study by Almeida et al. Both these studies suggested that use of topical nepafenac prophylactically is useful for preventing CME after cataract surgery. Furthermore, the use of 0.5% ketorolac tromethamine effectively decreased postoperative macular edema[8,9]. Both these studies showed a statistically significant decrease in macular thickness after the use of NSAIDs which is similar to our study.

Another study by Miyake et al also produced similar results. The study confirmed CME using fluorescein angiography, compared two groups of patients using nepafenac and fluorometholone postoperatively, and found that the incidence of CME was significantly lower in the nepafenac group ($p < 0.0001$) during both the second ($p = 0.0266$) and fifth ($p = 0.0055$) weeks[16]. A similar result was found in the study by McCafferty et al. The study concluded that the use of Nepafenac reduces the risk of PCME in patients with pre-op risk factors but has no benefit in patients with no risk factors. He therefore recommended that Nepafenac may not be used in patients with pre-op risks only rather than in all uneventful cataract surgeries[17]. Wittpenn et al studied the effect of Ketorolac with topical steroids in low-risk patients and found that the addition of Ketorolac significantly reduces the chances of developing PCME in low-risk patients[18].

A review article by Schalnus et al used more sensitive evaluation methods than visual acuity like contrast sensitivity. The study found no statistical difference while using prophylactic treatment of CME. According to the study the use of NSAIDs in not justified in low-risk patients as there is very less increase in macular thickness and loss of contrast sensitivity in routine cataract surgery in low risk patients[19].

Multiple similar studies have proved the efficacy of NSAIDs in preventing and treating PCME. Gamache et al proved in their study that Nepafenac is not only useful in preventing PCME but also is effective in treating trauma-induced ocular inflammation[20]. Guo et al discussed in detail the management of PCME and emphasized that when combined with topical steroids, topical NSAIDs have a synergistic effect in controlling post-op inflammation[21]. Wolf et al compared the effect of topical steroids alone and when combined with topical Nepafenac on PCME. He also found that the patients who used Nepafenac had a significantly lower incidence of PCME[22].

A few locally conducted studies also produced similar results. A study conducted by Jahan Zaib et al compared two groups after phacoemulsification. One group was given 0.1 % Nepafenac and the other group was given 1% Prednisolone. Post op central macular thickness was significantly lower in Nepafenac group compared to Prednisolone group[23]. Similarly, another study by Wali Ullah et al compared two

groups after phacoemulsification. One group received standard treatment whereas other group received additional 0,1 % Nepafenac along with the standard treatment. The group receiving 0.1 % Nepafenac had statistically significant lower central macular thickness compared to other group[24].

All the above-mentioned studies validated our results in which the Nepafenac group had a statistically significant lower thickness of macula on OCT postoperatively.

Conclusion:

0.1% Nepafenac is a well-tolerated drug with a significant decrease in macular thickness as compared to placebo following uneventful phacoemulsification. Post-operative use of topical NSAIDs leads to the prevention of central macular edema following cataract surgery. Further trials are required to understand an in-depth analysis of the efficacy of topical NSAIDs regarding retinal thinning.

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ORIGINAL ARTICLE

Primary Open-Angle Glaucoma And Serum Vitamin D Levels

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Abstract:

Objectives: To compare the levels of vitamin D of patients having primary open-angle glaucoma with controls

Methodology: This was an observational, cross-sectional study, carried out at the Department of Biochemistry & Department of Ophthalmology, Watim Medical College, Rawat, Rawalpindi. Medical records of 150 patients from the last 5 years were reviewed to categorize them into two groups, Group I diagnosed with POAG based on established criteria (specific optic nerve changes, open angle on gonioscopy and specific visual field defects) & Group II (Controls). Data collection from medical records included: age, gender & Serum vitamin D level in ng/ml. Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics were used to review the demographic data (age & gender) and the vitamin D levels both for the POAG group and control. Independent t-test was used to compare serum vitamin D levels of the two groups while considering the p-value less than 0.05 as statistically significant.

Results: The mean vitamin D levels in Group I (POAG) was 39.75 ± 9.64 ng/ml vs vitamin D level in Group II (Controls) 38.22 ± 7.59 ng/ml with no statistically significant difference.

Conclusion: We found no role of serum vitamin D levels in primary open-angle glaucoma. *Al-Shifa Journal of Ophthalmology 2024; 20(2): 56-60.*

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Introduction:

Primary open-angle glaucoma (POAG), being among the common causes of permanent visual loss, is a serious concern all over the world.[1] It is estimated that millions suffer from this illness worldwide with the number expected to increase to a worrying figure of 112 million in 2040.[2] The reported worldwide prevalence of POAG is 2.4% which increases with age[3] and males are found to be more susceptible to POAG than females.[4] It is reported to be most prevalent in Africa (4.2%) whereas in Pakistan the situation appears particularly critical. Studies report the incidence of POAG between 2.2% to 4.2% in the age group of 40 and above.[5] This poses a significant public health burden to any community as vision loss impacts not only

the quality of life but also hinders the overall productivity of the individual and the community.

POAG is characterized by a gradual deterioration of the optic nerve leading to visual field defects. Increased intraocular pressure (IOP) is a key underlying factor. Despite significant research efforts, the precise mechanisms underlying optic nerve degeneration in POAG remain unclear. Several theories have been proposed which includes reduced blood flow to the optic nerve, oxidative stress and excitotoxicity (damage caused by excessive glutamate stimulation).

While the exact mechanisms leading to optic nerve damage in POAG remain under investigation, researchers increasingly suspect that oxidative stress has a noteworthy part in its etiology and progression.[6] Oxidative stress arises once the body's natural antioxidant defenses are overcome by free radicals leading to cellular damage. This incited attention to the potential protective effects of minerals, vitamins and antioxidants leading to the finding that vitamin C and E, act as free radical scavengers, having a shield effect on the optic nerve from oxidative damage.[7,8]

Researchers are increasingly interested in the potential role of vitamin D in eye health. This essential nutrient, well-known for its contributions to bone health and immune function, has two main sources: sunlight and food. Exposure to ultraviolet (UV) light from the sun triggers vitamin D synthesis in the skin while dietary sources contribute a smaller amount. Once absorbed in the intestines or synthesized in the skin, it is converted by the liver into its main storage form, 25(OH)D. This form, measured in the blood serum, is the primary indicator of a person's vitamin D status. Generally, when the serum 25(OH)D levels are below 30 ng/ml, it is considered to be a vitamin D deficiency.[9] While the literature has linked vitamin D to eye diseases like refractive errors, dry eyes, age-related macular degeneration, and cataracts, it also suggested a likely role of vitamin D in retinal ganglion cell function and optic nerve health, potentially leading to POAG.[10] We conducted this study to explore the association of vitamin D with POAG by comparing serum vitamin D levels of patients with POAG and control hoping this will help in future POAG prevention and management strategies.

Materials and Methods:

It was an observational (cross-sectional) study conducted adhering to the Declaration of Helsinki and after the approval of the hospital ethical committee. To determine sample size, we used previous study data (mean) for a two-mean comparison with $\alpha = 0.05$, $\beta = 0.05$, and power = 0.95. Non-probability convenient sampling method was used to review medical records of 150 patients (≥40 years old) from the last 5 years allowing us to categorize them into two groups: Group I (POAG): Adults (≥40 years old) diagnosed with POAG based on established criteria (specific optic nerve changes, open angle on gonioscopy and specific visual field defects) confirmed through medical record review. Group II (Controls): Age- and sex-matched adults without a history of glaucoma or any eye condition affecting optic nerve health.

Exclusion criteria were having angle closure or secondary glaucoma, history of ocular trauma, pregnancy, lactation, documented vitamin D supplementation within the past 6 months, and chronic illnesses affecting vitamin D metabolism (e.g., kidney disease, malabsorption syndromes).

Data collection from medical records included: Demographic data: age & sex and Serum vitamin D level in ng/mL (measurement done by radioimmunoassay technique with Diasorin SR® kit).

Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics were used to review the demographic data (age & gender) and the vitamin D levels both for

the POAG group and controls. Categorical data i.e., gender was expressed as frequencies and percentages while continuous data i.e. age and levels of vitamin D were presented as means with standard deviation. Independent t-test was used to compare serum vitamin D levels of the two groups while considering the p-value less than 0.05 as statistically significant.

Results:

The medical records of 150 patients were reviewed in this study which were divided into two groups of 75 participants each group (n = 75 per group). The mean age of participants in Group I (POAG) was 52.0 ± 10.25 years, while the mean age in Group II (Control) was 54.0 ± 9.5 years. There was no statistically significant difference in age between the groups (p > 0.05). The gender distribution was Group I (POAG) 45.33% male, 54.67% female (Male: Female = 1:1.2) vs Group II 44.00% male, 56.00% female (Male: Female = 1:1.27). The mean vitamin D level for participants in Group I (POAG) was 39.75 ± 9.64 ng/ml vs mean vitamin D level in Group II (Control) 38.22 ± 7.59 ng/ml with no statistically significant difference. (Table I)

Table 1: Descriptive statistics of POAG and control group

		Group I (n = 75)	Group II n = (75)	p value
Mean age in years		52.0 ± 10.25	54.0 ± 9.5	>0.5
Gender	Male	45.33%	54.67%	
	Female	44%	56%%	
Mean vitamin D levels in ng/ml		39.75 ± 9.64	38.22 ± 7.59	

Discussion:

The potential role of vitamin D in eye health, particularly related to POAG (primary open-angle glaucoma), has appeared as a new research area. Similar to its established connections with systemic diseases affecting teeth, bones, and the cardiovascular system, the receptors of vitamin D have been identified in the aqueous humor and vitreous of the eye[11] suggesting a possible role in the regulation of intraocular pressure which is the most important risk factor in open-angle glaucoma

Endocrine Society defined deficiency of vitamin D having serum levels below 30 ng/dl.[9] 0ur study found vitamin D levels trending towards the lower limit, which aligns with reports from other researchers in our region.[9,11] This widespread deficiency is likely due to several factors, including reduced outdoor activities, increased screen time, and sun avoidance practices.[9]

While some studies haven't found any association between levels of vitamin D and IOP[12], others suggest vitamin D is negatively correlated with intraocular pressure.[13] Yoo et al [14] observed an inverse association between vitamin D levels and IOP in men with glaucoma. Ayyagari et al[15] also reported a similar trend in the African American population. Further investigation is needed to elucidate the possible mechanisms by which vitamin D might influence IOP and its subsequent impact on glaucoma development.

Several studies suggest a probable connection between low vitamin D levels and increased risk of POAG. Yoo et al[14] and Lv et al[16] reported low levels of vitamin D in glaucoma patients compared to controls. Additionally, Ayyagari et al[15] observed a connection between low vitamin D and increased POAG severity. These findings suggested a role for vitamin D in the occurrence of POAG, but our study, along with others like Carbone et al[17] and Dikci et al[18], did not reveal a difference in vitamin D levels in both groups. These conflicting

results necessitate further investigation with larger sample sizes, diverse populations, and standardized methodologies.

Researchers have found that low vitamin D levels can be a risk factor for glaucoma, but they are still unsure exactly how vitamin D is involved.[19] There may be a pathway involving oxidative stress, in addition to the already known increased IOP pathway. Vitamin D's antioxidant and anti-inflammatory properties might play a part in this. A study[19] showed that a specific form of vitamin D (1,25(OH)2D3) helped protect human retinal pigment epithelial cells from damage caused by oxidative stress. The vitamin seemed to work through antioxidant signaling pathways, lowering the level of harmful molecules and factors like ROS, cytokines, and VEGF.

Abouzeid H[20] suggested ethnicity may influence the association between vitamin D and glaucoma, potentially contributing to variations observed across studies. Our study contributes to the ongoing discussion by adding data on vitamin D levels in a specific population. However, future research with larger sample sizes and consideration of potential confounding factors is needed to definitively know the role of vitamin D in glaucoma.

Abouzeid H[20] also suggested gender-specific associations, with vitamin D playing a more significant role in males or females depending on the study population. Further research is needed to explore how ethnicity, genetics, and sex hormones interact with vitamin D in influencing glaucoma risk While investigating how gene polymorphisms of vitamin D receptors might interact with vitamin D levels and glaucoma risk, Lv et al[16] found an association between vitamin D absence and specific variations in the vitamin D receptor (VDR) gene, suggesting a potential genetic influence. Studies conducted in France, Croatia, US and Turkey further corroborated this trend.[20]

To the best of our knowledge, such data is lacking in Pakistan. It was not a prospective study a hospital based cross sectional retrospective study with a relatively small sample size with a specific ethnicity. Confounding factors like sunlight exposure and dairy intake were not considered, but we still believe that it has an impact on understanding the link of vitamin D with primary open angle glaucoma, especially in Pakistan.

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ORIGINAL ARTICLE

Etiology and Causative Bacteria of Microbial Keratitis in Mirpur Azad Kashmir

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Abstract:

Objectives: To determine the common etiology and causative bacteria in cases of microbial keratitis in Mirpur Azad Kashmir.

Methodology: This study is a retrospective analysis of the microbiological reports of all patients at Divisional Headquarters Mirpur Azad Kashmir who were diagnosed with bacterial keratitis between January 1, 2021, and December 31, 2022. The study included demographic information, past eye trauma history, ocular surface disease, usage of contact lenses and topical steroids, recent ocular surgeries, and diabetes mellitus.

Results: In a study involving 68 patients with eye infections, the average age was 39.93 years with a higher representation of males (47) than females (21). Most cases were due to trauma (62%), followed by ocular surface disease (19%), contact lens use (9%), topical steroid use (7%), and other causes like surgery or diabetes. Staphylococcus epidermidis was the most common causative bacteria (47%), followed by Streptococcus pneumonia (16%), Staphylococcus aureus (13%), Pseudomonas aeruginosa (10%), Staphylococcus hominis (9%), and Moraxella species (4%).

Conclusion: This study highlights the predominance of trauma as the leading cause of eye infections, with Staphylococcus epidermidis being the most common causative bacteria. *Al-Shifa Journal of Ophthalmology 2024; 20(2): 61-67. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

A dangerous eye ailment termed bacterial keratitis is defined by corneal inflammation brought on by a bacterial infection[1]. It is one of the main causes of visual impairment and, if left untreated, can have serious consequences. Eye pain, redness, excessive tears, blurred vision, light sensitivity, and the feeling of something alien in the eye are common symptoms of the illness[2].

Wearing contact lenses, corneal damage (such as scratches or cuts), ocular surface conditions (such dry eye syndrome), and weakened immune systems are the most frequent risk factors for bacterial keratitis[3]. Furthermore, wearing contact lenses while swimming or sleeping increases the risk of bacterial keratitis due to incorrect use or hygiene[4].

Although the gram-positive bacteria that cause the problem can vary, common culprits include Staphylococcus epidermidis, Staphylococcus aureus, and Streptococcus pneumoniae.

Severe bacterial keratitis instances have also been linked to gram-negative bacteria like Pseudomonas aeruginosa[5].

A thorough eye examination is usually required for the diagnosis, which also includes corneal cultures and slit-lamp biomicroscopy to determine the precise bacteria at play[6, 7]. Treatment entails starting broad-spectrum antibiotic eye ointments or drops right away; in severe cases, these are frequently given hourly[8]. In certain situations, steroid eye drops may be used to relieve inflammation; however, cautious monitoring is necessary to avoid the infection from getting worse[9].

Untreated or inadequately managed bacterial keratitis can result in permanent damage necessitating corneal transplantation[10], as well as complications such as corneal scarring, vision loss, and corneal perforation. Therefore, the management of bacterial keratitis and preservation of vision depends on early diagnosis, adequate treatment, and vigilant follow-up care[11].

Understanding the specific patterns of microbial keratitis in different regions is crucial for effective management and prevention strategies[12]. This research focuses on investigating the etiology and causative bacteria of microbial keratitis in Mirpur, Azad Kashmir, an area with unique environmental and demographic characteristics.

Materials and Methods:

The research was conducted as a retrospective study at Divisional Headquarters Hospital, Mirpur Azad Kashmir after taking ethical approval, spanning from 1st January 2021 to 31st December 2022. The study included all cases of bacterial keratitis with positive cultures. The study eliminated patients having multiple isolate cultures as well as those that were not bacterial. The study involved 68 patients in all. Age, gender, demographic data, history of previous eye injuries, ocular surface disease, use of contact lenses and topical steroids, recent ocular surgeries, and diabetes mellitus were all gathered from the patient's medical records. Information about the corneal cultures was gathered, including the organism's identity and the reason behind the microbial keratitis. Data was collected on a pre-designed proforma.

Data were analysed using SPSS version 21.0. Numerical variables like age were expressed as mean and standard deviation. Descriptive variables like gender, eye involved, etiology & causative bacteria were expressed as frequencies and percentages.

Results:

A total of 68 patients were included in this study. The mean age of patients included in this study was 39.93±11.422 years (Table I). There were 47 males (30.88%) and 21 females (60.12%) in this study. The number of right eyes was 36, & 32 were left eyes (Figure 1).

Regarding Etiology, 42 (62%) were caused by Trauma, 13 (19%) by Ocular Surface Disease, 6 (9%) by Contact Lens, 5 (7%) had a history of use of Topical Steroids, 1 (1%) had a history of ocular surgery (Iatrogenic) and 1 (1%) patient had a history of uncontrolled Diabetes Mellitus (Figure 2).

Regarding Causative Bacteria, 32 (47%) were Staphylococcus epidermidis, 11 (16%) were Streptococcus pneumonia, 9 (13%) were Staphylococcus aureus, 7 (10%) were Pseudomonas aeruginosa, 6 (9%) were Staphylococcus hominis and 3 (4%) were Moraxella Species. Table 2 shows the relationship between the etiology & causative bacteria of microbial keratitis.

Table 1: Mean age in the study (n=68)

Mean Age in the Study (Years)			
Mean	Std. Deviation	Maximum	Minimum
39.93	11.422	57	23

Table 2: Relationship between Etiology & Causative Bacteria of Microbial Keratitis

Etiology	Causative Bacteria						Total
	Staph. epiderm-idis	Strep. pneumoniae	Staph. aureus	P aeruginosa	Staph. hominis	Morexella Species	
Trauma	20	7	6	5	2	2	42
Ocular Surface Disease	7	4	0	0	1	0	12
Contact Lens	2	0	3	1	0	0	6
Topical Steroids	1	0	1	0	3	0	5
Iatrogenic	1	0	0	0	0	0	1
Diabetes mellitus	1	0	0	0	0	0	1
Total	32	11	10	6	6	2	67

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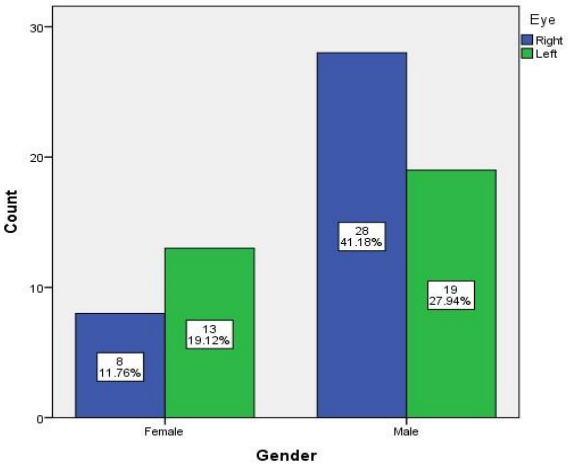

Figure 1: Gender & Eye Distribution in this study (n=68)

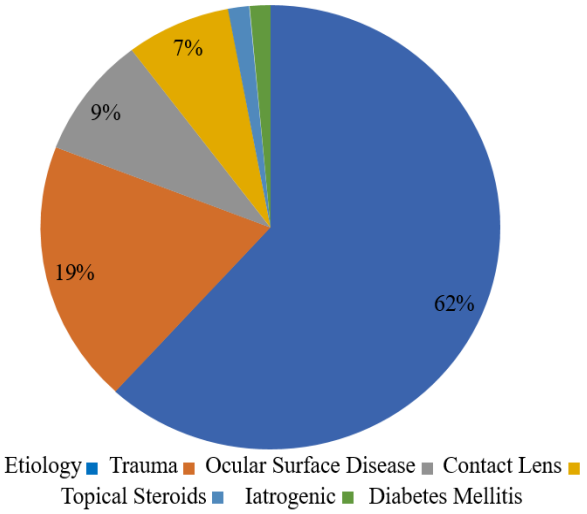

Figure 2: Etiology of Microbial Keratitis (n=68)

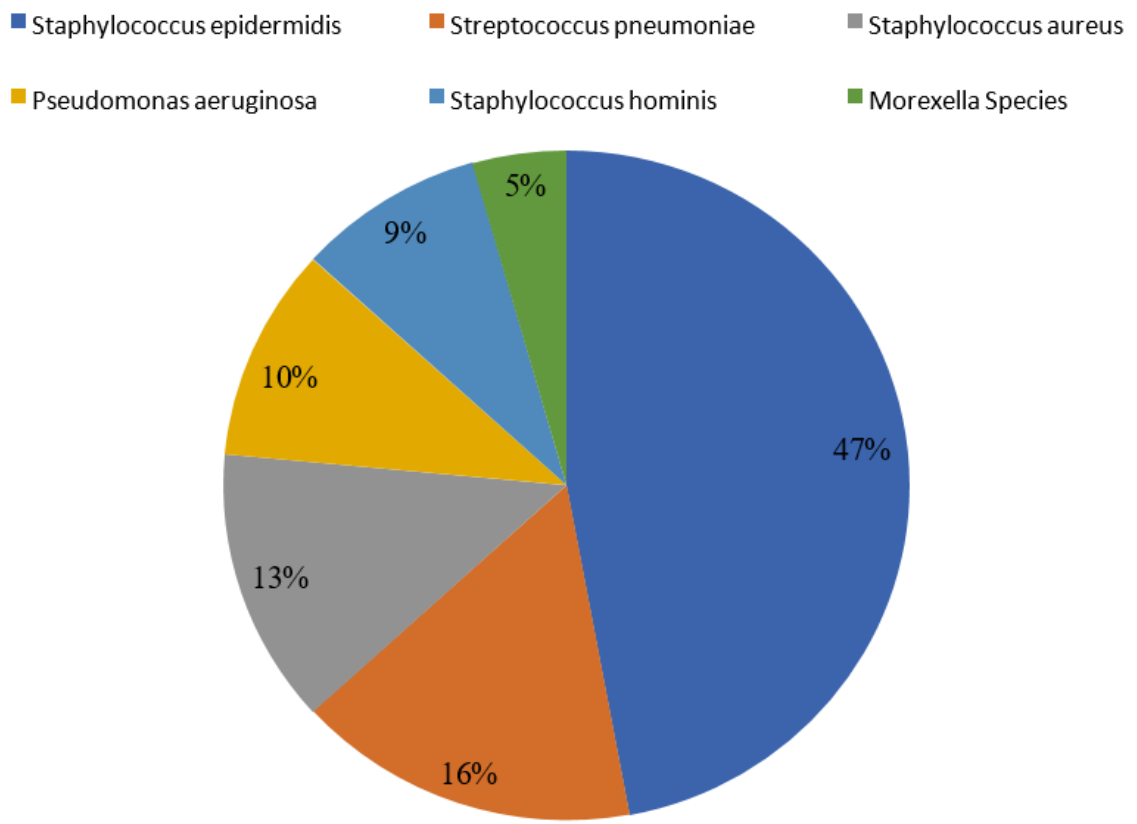

Figure 3: Causative Bacteria of Microbial Keratitis (n=68)

Discussion:

Microbial keratitis, caused by microbial infection, can stem from factors like trauma or contact lens use. Gram-positive bacteria such as Staphylococcus aureus and Streptococcus pneumoniae are common causes[13], entering the eye through direct contact or contaminated lenses[14]. Early diagnosis and specific treatment are vital for managing this condition and averting severe vision problems[15].

In comparing our study with the study on fungal keratitis in South Asia by Hoffman JJ et al[16], several key differences and similarities emerge. Firstly, while both studies focused on microbial keratitis, our study specifically delved into the etiology and causative bacteria associated with the condition, providing a comprehensive breakdown of the various factors contributing to keratitis cases. Conversely, the referenced study primarily concentrated on fungal keratitis, offering detailed insights into the clinical and epidemiological features predictive of its microbial etiology in Nepal. Despite these distinctions, both studies underscore the importance of accurate diagnosis and timely treatment in managing keratitis cases effectively.

In comparing our study of 68 patients (mean age 39.93 ± 11.422 years; male 47, female 21) to the study by Kase C et al[17] which consisted of 4047 patients (mean age 47.79 ± 20.68 years; male 53.27%), notable differences and similarities can be observed. Our study focused more on traumatic causes, with 62% attributed to trauma, while the referenced study did not provide specific percentages for trauma-related cases. Both studies identified Staphylococcus epidermidis and Staphylococcus aureus as prevalent agents, with our study observing Streptococcus

pneumoniae as well. However, their study highlighted contact lens use as associated with Acanthamoeba spp. (OR = 19.04; $p < 0.001$) and Pseudomonas spp. (OR = 3.20; $p < 0.001$), findings not explicitly discussed in ours. These comparisons highlight the need for a comprehensive understanding of corneal infections' epidemiology across different patient populations and risk factors.

There was another similar study conducted by Khor HG et al[18] in tropical climate. Notably, our study included a smaller sample size of 68 patients compared to their 221 cases. Our study revealed a higher mean age of 39.93 years, with a male predominance and a near-equal distribution between right and left eyes. In terms of etiology, trauma was the leading cause in both studies, although the percentages differed significantly, with our study reporting 62% compared to their 49.3%. Conversely, improper contact lens usage was more prevalent in their study at 29.1% versus our 9%. Interestingly, while their study found Pseudomonas aeruginosa as the most common bacteria, comprising 49.1% of cases, our study identified Staphylococcus epidermidis as the predominant causative agent at 47%. These variations in demographics, etiology, and causative organisms highlight the diverse nature of microbial keratitis presentations and underline the importance of region-specific studies to inform targeted treatment strategies.

If we compare our study of 68 patients with microbial keratitis to a study of 80 pediatric cases by Hepschke JL et al[19], notable differences and similarities are present. Our study had a higher mean age of 39.93 years, with 47% males and 62% of cases attributed to trauma. In contrast, the pediatric study had a mean age of 11 years, with 55% males and trauma causing 24% of cases. Both studies identified contact lens wear as a risk factor, with prevalence at 9% in our study and 26% in the pediatric study. Staphylococcus epidermidis was the most common isolate in both studies, at 47% in ours and unspecified in the pediatric study, followed by Staphylococcus aureus and Pseudomonas aeruginosa. Streptococcus pneumoniae was notable in our study at 16%. These findings underscore the importance of age-specific considerations and tailored management approaches in microbial keratitis cases.

Another study, by Lim Wen Siang J et al[20] with similar objectives. When comparing our study of 68 patients with this study of 75 eyes in 74 patients, key differences are obvious: This study reports a higher male-to-female ratio of 13.8:1, a mean age of 48 years, and 70% of patients aged 20-59, whereas our study had a mean age of 39.93 years with a more balanced gender distribution. Trauma was the leading cause in our study (62%), while corneal foreign bodies were predominant (56%) in this study, impacting visual outcomes significantly ($P<0.005$). Both studies highlight Gram-negative bacteria, with Pseudomonas species notably prevalent; however, our study noted Pseudomonas aeruginosa in 10% of cases, lower than this study's 26.7% with Pseudomonas sp. Both studies underscored the correlation between specific bacteria and poor visual outcomes, emphasizing the importance of early intervention strategies.

Pseudophakic cystoid macular edema (PCME) is one of the most common postoperative complications of cataract surgery. As the etiology is multifactorial, the incidence of PCME is variable and ranges from 1-30%[1]. Although most of the patients develop subclinical PCME with no effect on vision, some of the patients do develop poor central vision after an uneventful cataract surgery. It is therefore important to identify the risk factors at the time of planning cataract surgery so that appropriate steps can be taken to prevent the occurrence of PCME[2].

Conclusion:

The study conducted in Mirpur Azad Kashmir provides valuable insights into the

demographics, causes, and bacterial agents responsible for eye infections in the region. It emphasizes the predominance of males in the sample group. The study identifies trauma, ocular surface diseases, and contact lens usage as significant contributors to eye infections, highlighting the need for targeted preventive measures and educational initiatives to promote better eye hygiene practices. The findings regarding the most common causative bacteria underscore the importance of effective treatment strategies tailored to the prevalent microbial agents, aiming to reduce the burden of eye infections and improve ocular health in the community.

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ORIGINAL ARTICLE

Effectiveness in Achieving Retrobulbar Infiltrative Anesthesia With and Without Prior Dermal Application of Lidocaine on Lids in Cataract Surgery Patients

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Abstract:

Objectives: To assess the effectiveness of infiltrative anesthesia with or without prior use of lidocaine gel at the site of needle-insertion in patients undergoing cataract surgery and its association with needle-insertion pain.

Methodology: An observational case-control study was conducted with a sample size of 214 cataract surgery patients, who were randomly and equally assigned to case and control groups. A self-designed questionnaire was used to collect information from the surgeon about effectiveness of anaesthesia and akinesia, and the patient was asked about pain during needle-insertion on a 1–10 pain scale. The surgeon performed all procedures with the same tools and techniques. The data was analysed using SPSS. Furthermore, qualitative data was analysed using Pearson's chi-square association.

Results: This case-control study with equally distributed 214 participants, mean age 57.1 ± 9.34, shows significant differences in anaesthesia, akinesia, and pain levels between both groups. The case group showed better results: 78.5% had no movements during surgery while 62.2% had partial movement. In the control group ($p = 0.000$); 83.2% had complete anaesthesia in contrast; 64.5% had partial anaesthesia in the control group ($p = 0.000$); and 67.3% felt mild pain during needle insertion; on the other hand, 74.8% felt severe pain in the control group ($p = 0.000$).

Conclusion: The findings show that using dermal lidocaine gel before an ocular infiltrative block enhances level of anaesthesia and akinesia while decreasing needle-insertion pain. This results in more patient comfort and satisfaction during surgery. *Al-Shifa Journal of Ophthalmology 2024; 20(2): 68-74.*

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Introduction:

Cataract, clouding of natural lens of the eye, continues to be a major global health burden and a huge cause of worldwide blindness in developing countries despites increasing worldwide acknowledgments about cataract and outreach.[1] [2] Surgery remains the most effective treatment for cataract and widely performs procedure worldwide.[3] It is done through replacement of cloudy natural crystalline lens of eye with an artificial lens.[4] Anesthesia plays crucial role in cataract surgery [5,6] with the primary objective of patient welfare as well as delivering effective pain relief to create a comfortable experience.[7]

One of the regional anesthesia used for cataract surgery includes retrobulbar block which is give behind the globe in the retrobulbar space.[8] Although retrobulbar block gives most favorable outcomes in terms of complete eye akinesia and pain reduction during surgery[9], the insertion of the needle during the procedure is linked to pain and anxiety, potentially leading to hemodynamic instability and increased discomfort[10]. Lidocaine, amino amide-based anesthetic,[11] finds widespread use in alleviating pain following small invasive or surgical procedures.[12]

The fright of pain resulting from the administration of local anesthetics is a common reason for people avoiding medical procedures. However, the use of topical anesthetics can help alleviate the pain and irritation caused by needle insertion. Several research have demonstrated that employing topical anesthetics effectively reduces discomfort during injection, providing a more comfortable experience for patients undergoing medical procedures.[13,14]

Effective anesthesia also contributes to the patient's comfort and ease, which in turn facilitates the surgeon's performance. In cataract surgery, retrobulbar anesthesia is commonly used, despite its challenges. One of the difficulties with this type of anesthesia is its proximity to the eye, which increases the risk of needle placement errors. Additionally, patients may experience anxiety and alertness during the procedure, which can be problematic. To address these concerns, this study aims to investigate whether prior dermal application of lidocaine can provide better akinesia and painlessness during cataract surgery. By exploring this option, surgeons can potentially improve the overall experience for the patient and reduce the likelihood of complications.

Materials and Methods:

This observational case-control study included patients undergoing phacoemulsification cataract surgery at Layton Rahmatullah Benevolent Trust Hospital in Lahore, Pakistan, from June 2023 to September 2023. Before the individual interventions, all patients submitted written informed consent regarding the use of their medical information in the study analysis. The sample size of 214 participants was calculated using an online calculator available at 'Openepi' according to the Fleiss sample size formula. The ratio of the sample size of the case and control was 1:1. The study power was held constant at 80% and the level of significance was 5%. After the patients had provided written informed consent for the procedure, they were randomly sampled and divided equally between the case and control groups. This study included cooperative patients who had no anesthesia-related complications and fulfilled the study inclusion requirements. The exclusion criteria were patients with retrobulbar hemorrhage, sunken eyes, hearing problems, and intellectual disabilities. The administration of topical dermal anaesthesia on the lower eyelid as well as retrobulbar anaesthesia was performed by the surgeon team, which had no personal relationship, was not part of the research team, and had no bias. About 2–5 minutes after the administration of predermal lidocaine, a retrobulbar block was done by a 1-year postgraduate trainee. Petroleum jelly was applied topically to the lower eyelids of the control group patients so that the surgeon could avoid any surgery bias.

A scale-based performance rating will be completed by the surgeon after surgery based on the degree of anesthesia and akinesia attained during surgery. Patients were asked about the extent of pain felt by the patient during block insertion using a pain rating scale from 0 to 10. Demographic and clinical characteristics of the patients, such as name, gender, age, contact number, occupation, eye requesting surgery for (right or left), and visual acuity of the patient (both eyes), were recorded. All data

was organised and assessed for completion. The Statistical Software for Social Science (SPSS) version 20.0 was used for data analysis. All the quantitative data was analysed using frequency distribution, mean and standard deviation such as age, gender, eye being operated and pain score. The comparative association of qualitative variables such as level of anaesthesia, level of akinesia, and extent of pain between the case and control groups was assessed using Pearson's Chi-square association and frequency distribution. A p-value less than 0.05 were considered statistically significant.

Results:

The study included 214 participants undergoing phacoemulsification cataract surgery, with 60 (28%) females and 154 (72%) males. The participants are divided into case and control groups. Each group had an equal number of participants, of which 159 had surgery on the right eye and 55 had surgery on the left eye. The participants' mean age was 57.1 ±9.3 years with a range of 30 to 80 years. The case group had anesthesia with prior dermal lidocaine administration, while the control group had anesthesia without prior dermal lidocaine administration. The level of anesthesia, level of akinesia, and extent of pain were measured to determine the effectiveness of anesthesia before cataract surgery. These factors were significantly different in both groups providing evidence that the prior dermal application of lidocaine gel on the lower eyelid increases the efficacy of ocular infiltrative anesthesia. The association of qualitative variables such as level of anesthesia, level of akinesia, and extent of pain was assessed with Pearson's Chi-square association in Table 1,2,3. Comparison mean of extent of pain felt by patients during injection in both groups is presented in Table 4.

Table 1: Association of Level of Akinesia with & and without prior dermal applications of lidocaine

Anesthesia Group	No Akinesia N%	Partial Akinesia N%	Complete Akinesia N%	Total	P-Value
Case Group	2 (1.9)	21 (19.6)	84 (78.5)	107	0.0001
Control Group	38 (35.5)	67 (62.2)	2 (1.9)	107	
Total	40 (18.7)	88 (41.1)	86 (40.2)	214	

Table 2: Association of Level of Anesthesia with & and without prior dermal applications of lidocaine

Anesthesia Group	No Anesthesia N%	Partial But Acceptable Anesthesia N%	Complete Anesthesia N%	Total	P-Value
Case Group	0 (0.0)	18 (16.8)	89 (83.2)	107	0.0001
Control Group	37 (34.6)	69 (64.5)	1 (0.9)	107	
Total	37 (17.3)	87 (40.7)	90 (42.1)	214	

Table 3: Association of Extent of Pain Felt by Patients during Injection

Anesthesia Group	No Pain N%	Mild Pain N%	Moderate Pain N%	Severe Pain N%	Total	P-Value
Case Group	3 (2.8)	72 (67.3)	31 (29.0)	1 (0.9)	107	0.0001
Control Group	0 (0.0)	1 (0.9)	26 (24.3)	80 (74.8)	107	
Total	3 (1.4)	73 (34.1)	57 (26.6)	81 (37.9)	214	

Table 4: Comparison Mean of Extent of Pain Felt by Patients during Injection in both groups

Anesthesia Group	Mean	N	Std. Deviation (±)
Case Group	1.28	107	0.528
Control Group	2.74	107	0.462
Total	2.01	214	0.883

Discussion:

Retrobulbar infiltrative anaesthesia is commonly used for ocular procedures**,** [8] but it is also related to needle-insertion-related pain and anxiety.[10] Mimouni M. et al., while examining patients' subjective feelings of discomfort and anxiety during retrobulbar injections, showed that 10% or so of patients with retrobulbar blocks experience really bad pain and anxiety out of 48 patients**.**[15] The fear of pain resulting from the administration of local

anaesthetics is a common reason for people to avoid medical procedures. However, the use of topical anaesthetics can help alleviate the pain and irritation caused by the needle insertion. [13] [14] Topical analgesia can also effectively decrease the perceived anxiety related to future cannulation procedures.[13] Several researches have demonstrated that employing topical anesthetics effectively reduces pain during injection, providing a more comfortable experience.[14]

Previous studies from the 1990s showed that topical anaesthesia can significantly reduce the pain associated with local anaesthesia in ocular surgeries.(16) (17) Our study revealed significant pain differences between the case and control groups while injecting anaesthesia, which is consistent with the findings of Cho S-Y et al.'s [14] randomised clinical trial. This study focuses on the effects of topical anaesthesia on pain during needle insertion and injection, along with how it correlates with anxiety in patients having apical surgery. In the present study, the mean pain scores for the case group were 1.28 ± 0.52 and 2.74 ± 0.46 for the control group (Table 4), which is close to Cho's RCT, where the mean pain scores following anaesthetic injection were 1.73 ± 1.30 in the topical anaesthetic group and 3.00 ± 2.24 in the placebo group. These findings support the idea that topical anaesthesia application at the site of needle insertion can reduce pain during anaesthetic injection.

On the other hand, a study conducted by Parirokh M. et al. [18] shows different results from our study. This cross-over, double-blinded study focuses on the effect of topical anaesthesia on pain during infiltration injection and the success of anaesthesia for maxillary central incisors. This study shows mean pain score values during needle penetration were 1.5 ± 0.8 and 1.6 ± 0.8 after using topical anaesthesia and placebo. These are significantly different and are not comparable to our study, hence opposing our findings.

Most of the existing literature focuses on pain reduction with topical anaesthesia at the site of needle insertion before infiltration injections, but there is not much concentration on its impact on the efficacy of infiltrative anaesthesia. Our study examines not only the pain-relieving effects but also the efficacy of infiltrative retrobulbar anaesthesia after topical anaesthesia administration at the site of needle insertion.

This study's findings indicate an enhancement of the efficacy of retrobulbar anaesthesia combined with pre-dermal topical lidocaine treatment in patients undergoing cataract surgery. Dermal lidocaine and retrobulbar anaesthesia work together to significantly reduce injection discomfort, enhance akinesia, and provide efficient anaesthesia, thereby enhancing the overall experience of the patient undergoing cataract surgery. Dermal lidocaine can be a secure and beneficial addition to retrobulbar anaesthesia that can enable doctors to increase patient satisfaction and comfort during ocular surgeries.

The study lacks crucial data on the subjective pain experiences of patients during surgical procedures. In addition, as the study is only conducted on cataract surgery patients without several surgical procedures to compare, assessing the relative effectiveness or outcomes of the surgery in question becomes difficult. However, performing several procedures for research objectives may create ethical problems as well as practical issues such as additional expenses, time, and resources. Although the findings are not generalizable, they shed light on the association between predermal lidocaine application and the efficacy of retrobulbar infiltrative anaesthesia.

Conclusion:

This observational case-control study provides significant outcomes that confirm pre-dermal lidocaine and retrobulbar anaesthesia work together to significantly

reduce injection discomfort, enhance akinesia, and provide efficient anaesthesia, thereby enhancing the overall experience of the patient undergoing cataract surgery. Dermal lidocaine is a secure and beneficial addition to retrobulbar anaesthesia that enables doctors to increase patient satisfaction and comfort during cataract surgery operations.

Recommendations:

Surgeons can use Lidocaine application to enhance efficacy of infiltrative anaesthesia. Future Larger-scale studies can be done using advanced monitoring technology Pain evaluation. Which also include Patient self-reporting.

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ORIGINAL ARTICLE

Surgical Outcomes of Phacoemulsification at A Tertiary Care Eye Hospital

Rebecca Murtaza[1], Sabihuddin Ahmad[1], Sana Naveed[1], Inam ul Haq[1]

Abstract:

Objectives: To evaluate the visual outcomes of phacoemulsification surgery at a tertiary care eye hospital.

Methodology: A retrospective clinical study was done in Al-Shifa Trust Eye Hospital Rawalpindi. A total of 3075 eyes were included that underwent phacoemulsification. Patients of >40 years with follow up visit were included. The best corrected visual acuity was noted before and after 06 weeks of phacoemulsification and categorized according to World Health Organization criteria (Good, Moderate and Poor). Data was analyzed by SPSS 22.0 version.

Results: Total 3075 eyes are included in the study, out of which males are 1816 (59.1%), and 1259 (40.9%) females, total right eyes were 1895 (61.6%) and left 1180 (38.4%). Only those patients are included who fulfilled the follow up criteria. The preoperative BCVA was poor in 1839 (59.8%), moderate in 801 (26%), and good in 435 (14.1%). The postoperative BCVA at 6 weeks was good in 2467 (80.2%), moderate in 449 (14.6%), and poor in 159 (5.2%).

Conclusion: The visual outcome of phacoemulsification by calculating vision post operatively is a good tool for maintaining high quality surgical performance. Proper follow up of patients can save patients from postoperative complications. An audit may benefit by refining surgical skills. *Al-Shifa Journal of Ophthalmology 2024; 20(2): 75-79.*

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Introduction:

The estimated visual impairment worldwide is present in about 285 million people, out of which 246 have low vision and 36 million are blind, amongst them cataract is accountable for half of it.[1]1 In developing countries about 90% of visually impaired people live, of which 82% are >50 years old which is 19 % of world's population.[2] The prevalence of cataract in developing countries is about 50% while it is 5% of total blindness in developed countries. The cataract is responsible for bilateral blindness in 1.75% of Pakistan's population.[3,4] Cataract surgery is most commonly performed surgical procedure throughout world nowadays, because of the upgraded procedures and instrumentation with good visual outcomes.[5] There are different surgical procedures for cataract extraction, but phacoemulsification is most commonly performed nowadays. The

cataract surgery is considered successful when the patient is satisfied with the improvement in visual acuity. Hence expected vision should be as much closer as acquired vision.[6,7]

The clinical audit is a useful device to survey the services given by health professionals and rectify the mistakes for better results in the future. The recommended post-operative visual outcome by the WHO following cataract surgery should be good i.e.: 6/6-6/18 in 80% of cases.

Materials and Methods:

The retrospective clinical data of phacoemulsification from Jan 2022 to Dec 2022 reviewed in Alshifa trust eye hospital Rawalpindi. This study had Ethical Review Board approval (ERC-12/AST-23) and adhered to the Declaration of Helsinki. Patients aged >40 years old with cataract and who were advised postoperative follow-ups were included. Eyes with traumatic cataract, previous trabeculectomy, diabetic retinopathy and other visual debilitating retinal pathologies were excluded. The Uncorrected visual acuity and best corrected visual acuity on Snellen's chart before and after surgery were noted along with slit lamp ocular exam up to 6 weeks postoperatively. Keratometry (K1 and K2), and Amplitude-Scan was done for biometry of IOL power using SRKT-II formula. Standard phacoemulsification techniques were used, postoperative review at 1 day, 1 week, and 6 weeks was done. SPSS version 22.0 is used for data analysis. The data was presented in the form of mean and frequency for quantitative and continuous variables. The categorization of visual acuity before and after surgery was done by using the WHO guidelines: Good outcome = 6/6-6/18; Borderline= <6/18 - 6/60 and Poor= <6/60.

Results:

Total 3075 eyes are included in the study out of them males are 1816 (59.1%), and 1259 (40.9%) females (Table-I & II), total right eyes were 1895 (61.6%) and left 1180 (38.4%). Only those patients are included who fulfilled the follow up criteria. The preoperative BCVA was poor in 1839 (59.8%), moderate in 801 (26%), and good in 435 (14.1%). The postoperative BCVA at 6 weeks was good in 2467 (80.2%), moderate in 449 (14.6%), and poor in 159 (5.2%).

Table 1: Shows Gender of Subjects and Eyes

	Frequency	Percent
MALE	1816	59.1
FEMALE	1259	40.9
RIGHT EYE	1895	61.6
LEFT EYE	1180	38.4

Table 2: Shows Vision Of Subjects Before and after Surgery

VA= Visual Acuity (Before surgery)

BCVA= Best Corrected Visual Acuity

VA	Frequency	Percent
6/12-6/18 (good)	435	14.1
<6/18-6/60 (Moderate)	801	26
<6/60 (Poor)	1839	59.8
BCVA after 06 weeks of surgery		
6/6-6/18 (Good)	2467	80.2
<6/18-6/60 (Moderate)	449	14.6
<6/60 (Poor)	159	5.2

Discussion:

The cataract surgery is not solely to treat blindness, but it has evolved to be the refractive surgery for aiming to achieve highest quality of refractive and visual results along with patient satisfaction.[8,9] In 1998 World Health Organization in a workshop named "Outcome in prevention of blindness programs suggested to evaluate cataract surgical outcome in terms of visual acuity assessed with best corrected visual acuity. This suggests the cause of poor outcome after cataract surgery, which could be due to early or late post-operative complications, refractive errors, and preexisting eye disease. By evaluating the cause of poor results this is how the ophthalmologists can address and improve surgical outcome.[10] We have tried to evaluate the postoperative surgical outcomes after phacoemulsification in our study in the subjects who underwent cataract surgery at tertiary care teaching hospital, Rawalpindi. As ASTEH (Al Shifa Trust Eye Hospital) is a teaching hospital hence the surgeries were done by both highly qualified surgeons and the trainees.

It is estimated that comparative to temporal incisions, the superior limbal incisions induce greater corneal astigmatism and against the rule astigmatism.[11-15] In our study we could not calculate the amount of post-surgical astigmatism.

The clinical audit helps to evaluate necessary facts, e.g.: time duration, equipment used, and surgical steps.[16-19] hence for improvement of surgical results, audit and re-audit is required.[19,20]

Mavrakanas et al estimated 8.2 % an overall complication rate with 5.3% in MSICS and 10.2% in ECCE.[20] While in our study we could not calculate the percentage of posterior capsular rent and intraoperative complications.

In our setup the major route for anesthesia is peribulbar, while topical anesthesia is preferred by senior surgeons, while reverse is noted in NEON and PORT studies in which topical anesthesia was major route and rarely peribulbar blocks were done.[19,20]

The clinical audit helps to focus on necessary facts that are neglected during surgery like time taken during surgery, steps of surgery and instruments used, hence its recommended to audit and re-

audit for improvement of the quality of surgical outcome.[21-25]

Post operative visual acuity of 3075 (100%) eyes was recorded. After Phacoemulsification surgery, 2467 (80.2%) eyes had good VA compared with pre-operative measurements. There have been 449(14.6%) eyes of patients with moderate VA according to WHO criteria, while 159(5.2%) eyes had poor VA.

In our study we could not include the patients who lost follow up. We could not calculate the surgically induced astigmatism, postoperative retinal detachment, and vitreous loss. The visual acuity was checked on Snellen chart instead of log Mar which is reliable and standard method. Phacoemulsification was done by multiple surgeons and residents.

Conclusion:

The visual outcome of phacoemulsification done in our hospital showed good results. Proper follow up of patients can save patients from postoperative complications. An audit may benefit by refining surgical skills.

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