

## Topical proparacaine vs combined topical-intracameral lidocaine anesthesia in phacoemulsification surgery with preoperative counseling about intraoperative visual fear

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## **ABSTRACT**

### ***Background***

*Phacoemulsification under topical anesthesia makes a quickest visual recovery and reduces surgical time. Topical anesthesia with supplementary intracameral lidocaine may reduce some pain during iris manipulation or iris diaphragm movement.*

### ***Objective***

*To study the anesthetic efficacy of topical 0.5% proparacaine hydrochloride versus combined topical - intracameral 1% lidocaine injection during phacoemulsification surgery.*

### ***Method***

*Total 80 patients divided into A and B, each group having 40 patients was enrolled in this study. Phacoemulsification was performed on group A under topical anesthesia with proparacaine hydrochloride 0.5% and on group B under combined topical - intracameral injection of 0.5cc 1% lidocaine. Preoperatively, all patients received counseling about the potential intraoperative visual fear. Each patient was shown visual analogue scale 10 minutes after completion of surgery and was recorded their pain score. Unco-operative patients and previous history of ocular trauma were excluded.*

### ***Results***

According to visual analogue scale, on group A, 30% felt no pain, 50% felt mild pain and 20% felt tolerable moderate pain (level 4) and on group B, 80% felt no pain and 20% felt mild pain. The group A perceived pain higher than group B (P <0.001). Mean operation time was 10 minutes. Most of the patients in A and B groups had no eye movement (Group A: 88% and Group B: 95%).

### **Conclusions**

*The combined topical proparacaine - intracameral injection of lidocaine anesthesia is better than topical proparacaine during phacoemulsification ensuring patients and surgeons comfort. Preoperative counseling helps the patients to focus on operating microscope light during surgery.*

### **KEYWORDS**

Intracameral, pain, phacoemulsification, preoperative counseling, topical anesthesia.

### **INTRODUCTION**

Cataract surgery with the advent of phacoemulsification under topical anesthesia makes a quickest visual recovery and reduces surgical time. Under topical anesthesia, patients reported some pain during iris manipulation or iris diaphragm movement. Supplementary intracameral anesthesia may reduce these problems and smoothen the surgery. The rationale for using supplementary intracameral lidocaine is to provide anaesthesia for these intraocular structures. Many studies have reported that most of the patients undergoing cataract surgery may experience a multitude of visual sensations intraoperatively (Rengaraj, 2004) (Chaudhry, 2014) (Au Eong, 2000). These sensations may be affected by the type of anesthesia as patients who receive topical anesthesia (TA) are able to see more in comparison with patients who are administered region anesthesia (RA). Preoperative counseling about the potential intraoperative visual experience reduces the visual experience fear in patients having cataract surgery (Haripriya, 2011) (Shakya, 2015) (Voon, 2005).

This study focused on the anesthetic efficacy of topical proparacaine hydrochloride versus combined topical – intracameral lidocaine injection during phacoemulsification surgery.

### **METHODS**

This randomized and comparative study was carried out at Kathmandu Medical College, Kathmandu from September 2016 to December 2016. Total eighty patients (age 50-70 years) were divided into two groups, A and B. Every second patient was group as B. Informed consent was obtained from every subject before their enrollment in the study. Group A (40 patients) under topical anesthesia with proparacaine hydrochloride 0.5% and group B (40 patients) under topical anesthesia along with intracameral infiltration 0.5cc of 1% lidocaine underwent phacoemulsification surgery with foldable intraocular lens (Kale, 2012). Preoperatively all patients received counseling on the potential intraoperative visual experience viz light perception, fingers, instruments and gush of water (Chaudhry, 2014) (Haripriya, 2011) (Shakya, 2015) (Voon, 2005). Unco-operative patients, previous history of ocular trauma and corneal opacities were excluded from the study. Ethical clearance was obtained from the Institutional Review Committee.

### **Surgical method**

All patients were advised to instill Ofloxacin eye drop four times one day prior to surgery. A single drop of topical anaesthesia using Proparacaine hydrochloride 0.5 % eye drop was instilled three times for every two minutes before surgery. The patients were brought to the operating room where the eye was painted with betadine and draped for cataract surgery. All surgeries were performed by a single surgeon (KS). After ascertaining painlessness to patient by pinching conjunctiva of operating eye with plain forceps, the patient was instructed to fix the eye at light of operating microscope. The clear corneal tunnel incision and side port were fashioned. 0.5cc of 1% preservative free lidocaine was injected into anterior chamber through side port for group B. A continuous curvilinear capsulorrhexis was performed under a viscoelastic material (HPMC). The lens nucleus was mobilized using a balanced salt solution and a blunt hydrodissection cannula. Phacoemulsification was performed using the Oertli (Catarhex) phacoemulsifier with the phaco chop and endocapsular techniques by an operating microscope, CarlZeiss-S7. A foldable acrylic IOL with a 6mm phacoemulsification lens was inserted under the viscoelastic material through a 2.8mm opening. The viscoelastic material was aspirated. The wound was hydrated and an approximate physiological intraocular pressure was restored with a balanced salt solution injection through a side port. An intra-cameral injection of Cefuroxime 1mg was given at the conclusion of the surgery.

### **Pain assessment**

After 10 minutes of completion of surgery, each patient was shown a visual analogue scale with numeric and descriptive ratings from 0 (no pain) to 10 (severe pain) as described by Stevens (Stevens, 1992). Patients were asked to use this 10-point scale to rate the level of pain felt during the operation. In addition, any verbal expression of pain that patients made during the operation (eg, on manipulation of an iris) was recorded. Patients were asked to inform the surgeon if they experienced any pain at any point of the surgery. If so, additional anesthesia was given. Any ocular motility during the time of surgery, surgical complications and postoperative use of analgesics were recorded. The patient started post-operative prescription of Ofloxacin 0.3% eye drops four times daily and Prednisolone acetate 1% eye drops six times daily. All the patients' appointment was made for next day, one week and one month after surgery.

Data were entered and analyzed using SPSS version 20.0. A p-value of <0.05 was considered statistically significant.

## **RESULTS**

Thirty four (42.5%) of them were men and 46 (57.5%) were women. 58% of patients were above 60 years. According to visual analogue scale, on group A, 30% felt no pain, 50% felt mild pain and 20% felt tolerable moderate pain (level 4) and on group B, 80% felt no pain and 20% felt mild pain (**Table 1 and Table 2**). The group A perceived pain higher than group B ( $P < 0.001$ ). The mean pain score was 1.9 ( $SD \pm 1.52$ ) in group A and 0.35 ( $SD \pm 0.73$ ) in group B (**Table 3 and Figure 1**). Mean operation time was 10 minutes. Most of the patients in A and B groups had

no eye movement (Group A: 88% and Group B: 95%). The patients on group A used postoperative analgesics than those in group B ( $P < 0.001$ ).

**Table1. Characteristics of 80 Patients randomly assigned to receive Topical Proparacain with or without Intracameral Lidocaine for Phacoemulsification.**

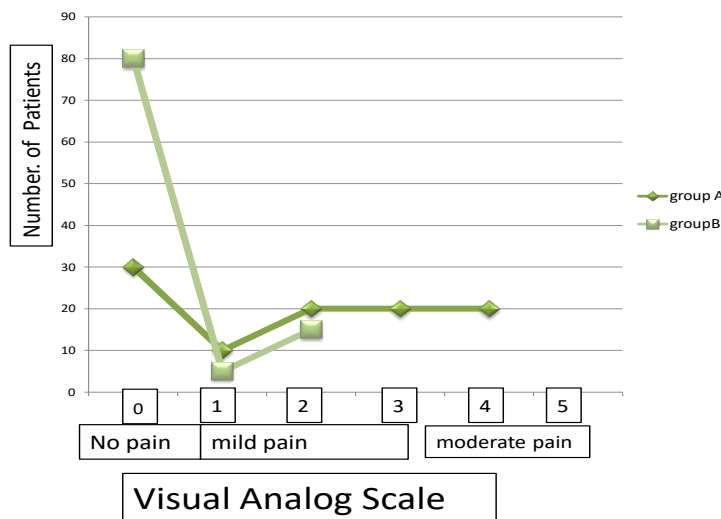
Variables	Group A(40 patients)	Percentage (%)	Group B (40 patients)	Percentage (%)	Level of Significance (P)
Age	<60	40		45	
	>60	60		55	
Preoperative visual acuity	Better than 6/18	35		37.5	
	Less than 6/18	65		62.5	
Visual analog scale	No pain	30	No pain	80	<0.001
	Mild pain	50	Mild pain	20	
	Moderate pain (level 4)	20	Moderate pain	0	
No eyeball Movement		88		95	0.057
Postoperative oral analgesics		20		5	<0.001

**Table 2. Characteristics of pain score according to visual analog scale.**

Group A (40 patients)			Group B (40 patients)		
Visual analog scale		Percentage (%)	Visual analog scale		Percentage (%)
No pain	0	30	No pain	0	80
Mild pain	1	10	Mild pain	1	20
	2	20		2	0
	3	20		3	0
Moderate pain	4	20	Moderate pain	4	0

**Table 3. Pain score (scale of 0–10).**

	Group A	Group B
Mean of pain score	1.9 (SD $\pm$ 1.52)	0.35 (SD $\pm$ 0.73)
Range	0–4	0–1



**Figure 1. Shows pain score among topical only group (A) and combined topical-intracameral lidocaine group (B).**

## DISCUSSION

Topical anaesthesia has become an increasingly popular option in modern phacoemulsification surgery as the patients benefit from a quickest visual recovery. But the patients experience intraoperative visual sensation and some pain during iris-diaphragm movement or iris manipulation. Preoperative counselling about the potential intraoperative visual experience alleviates the visual experience fear in patients having cataract surgery and many surgeons use intracameral lidocaine as a supplement to topical anaesthesia which significantly reduces intraoperative pain perception when compared to the use of topical anaesthesia alone.

In our study, there was a significant reduction in pain perception in the intracameral lidocaine group than in the topical proparacaine only group ( $P < 0.001$ ). Tseng H and his associates shows the difference between the pain scores for the placebo group (topical anesthesia with intracameral balanced salt solution [group 1]) and the interventional group (combined topical-intracameral anesthesia [group 2]) was statistically significant ( $P = 0.0053$ ). Combined topical and intracameral administration of lidocaine can further minimize intraoperative discomfort (Tseng, 1998). Similarly, Kale DN and co-workers found that the intracameral infiltration of 2% lidocaine injection with topical anesthesia is superior to topical anesthesia with proparacaine hydrochloride alone during phacoemulsification (Kale, 2012). Gills and Koch reported that irrigation of the anterior chamber with unpreserved lidocaine alleviated the intraocular discomfort of some patients undergoing cataract extraction and implantation of an IOL while under topical anesthesia (Gills, 1997) (Koch, 1997).

Thirty percent of patients in group A and 80% in group B leveled a score 0 in visual analog scale. Tseng H et al ninety percent of patients in group 1 and 95% in group 2 assigned a score of 0 or 1 to the level of intraoperative discomfort (Tseng, 1998).

In this study, the mean pain score was 1.9 (SD  $\pm$ 1.52) in group A and 0.35 (SD $\pm$  0.73) in group B. Patel et al reported that the mean pain score of 0.41 for patients (Patel, 1996).

All patients in group B experienced no ocular discomfort immediately after the injection of 0.5 cc of 1% preservative free lidocaine into the anterior chamber. Postoperatively, slit-lamp biomicroscopic examination showed no evidence of corneal pathology, edema, thickening, or other toxicity, nor did any patients in our study have unexplained iritis or other unusual intraocular inflammation developed. 0.5 cc of 1% preservative free lidocaine seems to be safe for the cornea, the anterior chamber, and the retina (Gills, 1997).

## CONCLUSIONS

The combined topical proparacaine - intracameral injection of lidocaine anesthesia is better than topical proparacaine only during phacoemulsification ensuring patients and surgeons comfort. Preoperative counseling helps the patients to focus on operating microscope light during surgery and alleviates the visual experience fear in patients having cataract surgery.

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