



Comparison of pain in patients with topical anaesthesia alone versus topical anaesthesia with intracameral lidocaine for phacoemulsification

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Abstract

Background: There is a wide range of techniques for local anaesthesia for cataract surgery including peribulbar, retrobulbar, sub-tenon and subconjunctival. While topical and intracameral anaesthesia are becoming more popular anaesthetic modalities. Patients receiving topical bupivacaine 0.5% with unpreserved intracameral lidocaine 1% during cataract surgery demonstrated a reduction in intraoperative analgesic requirements.

Objective: The objective of the study is to compare pain in patients with topical anaesthesia alone versus topical anaesthesia with intracameral lidocaine for phacoemulsification.

Place of Study and Duration: The study conducted at Department of Ophthalmology, Services Institute of Medical Sciences and Services Hospital, Lahore from January 2018 to March 2019.

Material and Methods: It was a randomized controlled trial conducted at Department of Ophthalmology, Services Institute of Medical Sciences and Services Hospital, Lahore. The pain score in each patient was measured using Visual Analog Scale during the surgery.

No pain 0-3

Pain 4-10

Results: One hundred and twenty patients divided into two equal groups A and B, 60 patients of group A were operated with topical anaesthesia alone and other 60 of group B operated under topical anaesthesia along with intracameral Lidocaine. Out of 120 patients 60 patients of group A have mean age of 54.55 and Standard Deviation 8.75 and 60 patients of group B gave mean age of 56.00 and Standard Deviation 9.01 Table-1. As regard to Gender of patients, out of 120 patients 61 (50.8%) were male and 59 (49.2%) were female Table 2. Similarly in group B were having mean pain score of 2.07 and Standard Deviation 1.00 Table-3. Similarly as regard to the pain out of 120 patients 110 (91.7%) were have no pain and 10 (6.3%) patients were have pain Table-4. According to the groups, out of 60 patients in the group A (operated with topical anaesthesia alone) 52 patients were have no pain and 8 were have pain Table-5. Similarly in group B (operated under topical anaesthesia along with intracameral Lidocaine) out of 60 patients 58 were have no pain and 2 patients were have pain Table-5, the resulted P value is P=.041.

Conclusion: There is significant reduction in pain score in patients operated under topical anaesthesia with intracameral lidocaine for phacoemulsification as compared to topical anaesthesia alone.

Keywords: phacoemulsification, Topical anaesthesia, intracameral lidocaine

1. Introduction

With the advent of phacoemulsification technique for cataract surgery, the requirements for anaesthesia have changed. An ideal anaesthesia should allow pain free surgery and facilitate a stress and anxiety free procedure both for patient and surgeon. There is a wide range of techniques for local anaesthesia for cataract surgery including peribulbar, retrobulbar, sub-tenon and subconjunctival [1], while topical and intracameral anaesthesia are becoming more popular anaesthetic modalities and they are both safe and effective because they tend to avoid the complications associated with traditional peribulbar and retrobulbar injections such as globe penetration, retrobulbar hemorrhage, optic nerve trauma, brainstem anaesthesia and extraocular muscle injury [2]. Topical anaesthesia is non-invasive, cost effective, and less prone to complications and provides better patient rehabilitation. In the USA alone topical anaesthesia has

found large acceptance where 61% of the surgeons use this modality of anaesthesia. The use of topical anaesthesia during cataract surgery was first introduced in 1992 by Fichman [3]. Patients receiving topical bupivacaine 0.5% with unpreserved intracameral lidocaine 1% during cataract surgery demonstrated a reduction in intraoperative analgesic requirements [2]. Crandall *et al.* reported that topical anaesthesia plus intracameral lidocaine 1% before phacoemulsification decreased the degree of discomfort during tissue manipulation and increased patient cooperation more than topical anaesthesia alone [4]. Lidocaine as anaesthetic has very fast onset and keeps the eye anaesthetized effectively for an intermediate span of time which is suitable for cataract surgery [5]. Furthermore, use of intracameral injection of preservative free lidocaine during phacoemulsification increases diameter of pupil by a mean value of up to 4.39±0.53 mm and the use of mydriatics for pupil dilation during the surgery is no more required [5].

Patients pain will be assessed during the surgery using a method based on observation and will be recorded on Visual Analog Scale (VAS). Parameters like vocalization, facial expression, and body language, behavioral and physiological changes help to evaluate pain in individual patients. Previously a similar study by Ejaz Ahmed Javed [6], recorded that out of 45 in group A (topical anaesthesia alone) only 5 patients (11.11%) felt pain so severe that they required injection fo 0.5 cc of 2 % lignocaine at the phaco site while in group B there were 45 patients and all of them were given 0.5 cc injection in the conjunctiva at the phaco port site and none of the patients felt remarkable pain. We planned this study to compare pain in groups A and B. The results of the study will be helpful for surgeons to administer the appropriate anaesthesia for better management of the pain. The introduction of small - incision phacoemulsification has revolutionized the way in which cataract surgery is carried out. Previously, the large incision needed for extra - capsular or intra - capsular cataract extraction carried a significant risk of serious complications at the time of surgery. In particular, contraction of the extra - ocular muscles could squeeze the globe and cause the vitreous and other ocular contents to be extruded through the surgical wound [7]. Safer surgery required either general anaesthesia (GA) or a technique of local anaesthesia (LA) that gave good akinesia of the extra - ocular muscles. The small, self - sealing incision used for modern phacoemul sification has greatly improved control of the wound and anterior chamber, and many surgeons feel that it is no longer necessary to have total akinesia of the globe for safe surgery.

The objective of the study is to compare pain in patients with topical anaesthesia alone versus topical anaesthesia with intracameral lidocaine for phacoemulsification.

Material and Methods

It was a randomized controlled trial conducted at Department of Ophthalmology, Services Institute of Medical Sciences and Services Hospital, Lahore. The pain score in each patient was measured using Visual Analog Scale during the surgery.

No pain 0-3
Pain 4-10

Results

120 patients divided into two equal groups A and B, 60 patients of group A operated with topical anaesthesia alone and other 60 of group B operated under topical anaesthesia along with intracameral Lidocain. Out of 120 patients 60 patients of group A have mean age of 54.55 and Standard Deviation 8.75 and group 60 patients of group B gave me an age of 56.00 and Standard Deviation 9.01 Table-1. As regard to Gender of patients out of 120 patients 61 (50.8%) were male and 59 (49.2%) were female Tale 2. As regard to the pain score patients in group A were have mean pain score of 2.67 and Standard Deviation 2.03 Table-3. Similarly in group B was having mean pain score of 2.07 and Standard Deviation 1.00 Table-3. Similarly as regard to the pain out of 120 patients 110 (91.7%) were have no pain and 10 (6.3%)

Patients were have pain Table-4. According to the groups, out of 60 patients in the group A (operated with topical anaesthesia alone) 52 patients were have no pain and 8 were have pain Table-5. Similarly in group B (operated under topical anaesthesia along with intracameral Lidocain) out of 60 patients 58 were have no pain and 2 patients were have pain Table-5, the resulted P value is P=.041.

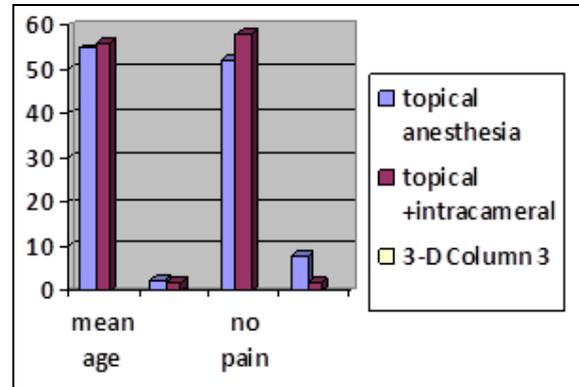


Fig 1



Fig 2

Table 1: Age of patient

groups of patients	Mean	N	Std. Deviation
topical anaesthesia alone	54.55	60	8.757
topical anaesthesia with intracameral Lidocain	56.00	60	9.014
Total	55.28	120	8.879

Table 2: Gender of patients

Gender of patient	Frequency	Percent
male	61	50.8
female	59	49.2
Total	120	100.0

Table 3: Pain score

score of pain			
groups of patients	Mean	N	Std. Deviation
topical anaesthesia alone	2.67	60	2.031
topical anaesthesia with intracameral Lidocain	2.07	60	1.006
Total	2.37	120	1.624

Table 4: Pain distribution

pain	Frequency	Percent
no pain	110	91.7
pain	10	8.3
Total	120	100.0

Table-5: Pain and group cross table

Groups of patients and pain Cross tabulation	pain		Total
	no pain	pain	
topical anaesthesia alone	52	8	60
topical anaesthesia with intracameral Lidocain	58	2	60
Total	110	10	120

Discussion

120 patients divided into two equal groups A and B, 60 patients of group A operated with topical anaesthesia alone and other 60 of group B operated under topical anaesthesia along with intracameral Lidocain. Out of 120 patients 60 patients of group A have mean age of 54.55 and Standard Deviation 8.75 and group 60 patients of group B gave me an age of 56.00 and Standard Deviation 9.01 Table-1. As regard to Gender of patients out of 120 patients 61 (50.8%) were male and 59 (49.2%) were female Tale 2. As regard to the pain score patients in group A were have mean pain score of 2.67 and Standard Deviation 2.03 Table-3. Similarly in group B was having mean pain score of 2.07 and Standard Deviation 1.00 Table-3. Similarly as regard to the pain out of 120 patients 110 (91.7%) were have no pain and 10 (6.3%) patients were have pain Table-4. According to the groups, out of 60 patients in the group A (operated with topical anaesthesia alone) 52 patients were have no pain and 8 were have pain Table-5. Similarly in group B (operated under topical anaesthesia along with intracameral Lidocain) out of 60 patients 58 were have no pain and 2 patients were have pain Table-5. The efficacy of topical anesthesia for pha-coemulsification has been widely reported⁷ and topical anesthesia is now the preferred technique for many cataract surgeons. Preserved ocular motility can be used to im-prove the operating conditions by optimizing the red reflex and wound access. There is no risk of globe perforation. Compared to regional anesthetic techniques, such as peribulbar anesthesia, the topical approach produces less vitreous pressure, and there is no effect on optic nerve blood flow. Postoperative recovery is quicker, postoperative pain is reduced, and patients may prefer the technique^[8]. However, topical anesthesia alone does not prevent pain sensation experienced by some patients, caused by movement of the iris-lens diaphragm^[9].

To achieve analgesia during intraocular surgery, impulses in pain fibers exiting the eye must be blocked completely, including impulses in the long fibers from the cornea, the iris, and the ciliary body to the ciliary ganglion. Failure of topical anesthesia to block sensations in all these fibers makes intraoperative manipulation of the iris particularly uncomfortable for patients undergoing intraocular procedures with topical anesthesia only. Various techniques have been advocated to alleviate patients discomfort associated with intraoperative manipulation^[10,11].

Grabow emphasized the importance of adequate cycloplegia to minimize stretching of zonules and ciliary muscle.¹² Novak and Koch recommended lowering of the irrigating solution bottle to minimize the hydrostatic pressure that could cause pain by stretching the ciliary body.¹³ Pandey *et al.* stated that gradual increase in microscope luminance, minimal intraocular and iris manipulation and keeping phaco power as low as possible to avoid excessive heating of the phaco tip are important factors to reduce pain.

The intracameral xylocaine technique which was designed to overcome these problems uses 0.5ml nonpreserved xylocaine 1%, which is injected into the anterior chamber at

the beginning of surgery. It was first described by Gills *et al*^[14]. Several studies have assessed the dosage regimens, efficacy, and safety of the technique^[15]. In our study, there was no difference in surgeons and patients satisfaction in both groups, and eye movements during surgery were more frequent in group 2, yet there was no statistical significant difference in both groups. These results may be attributed to the high skills of the surgeon and short time of the surgical procedure. Although the majority of patients in both groups of our study experienced no or only minimal discomfort and pain, the difference in mean pain score for the two groups was statistically significant^[16].

The efficacy of intracameral block was particularly striking when intraoperative manipulation was required. Patients who received only topical anesthesia were more likely to experience discomfort during iris manipulation, zonular stretching, and spasm of the ciliary body. In contrast, patients who received intracameral anesthesia were practically oblivious to such manipulations^[17].

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