

ORIGINAL ARTICLE

Assessment of efficacy of tetracaine hydrochloride 0.5% versus lidocaine 2% jelly in cataract surgery

¹Aradhana Bhaskar, ²Satya Prakash Singh

¹Associate Professor, Department of Anaesthesia, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India;

²Assistant Professor, Department of Ophthalmology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

ABSTRACT:

Background: Cataract surgery is a common and relatively safe surgical procedure performed to treat cataracts. The present study was conducted to compare the anesthetic efficacy of tetracaine hydrochloride 0.5% versus lidocaine 2% jelly in cataract surgery. **Materials & Methods:** 58 patients with cataract of both genders were divided into 2 groups of 29 each. Group I patients received tetracaine hydrochloride 0.5% and group II received lidocaine 2% jelly, applied once, approximately 5 minutes before surgery. All patients underwent cataract surgery by clear corneal phacoemulsification. Parameters such as postoperative pain score and the need for supplemental anesthesia were recorded. **Results:** Group I had 19 males and 10 females and group II had 15 males and 14 females. Score 0 was seen in 7 in group I and 10 in group II, score 1 in 9 and 5, score 2 in 5 and 4, score 3 in 4 and 2, score 4 in 3 and 5 and score 5 in 1 patient and 3 patients respectively. The difference was non-significant ($P > 0.05$). 1 patient in group I and 3 in group II required supplemental anesthesia. The difference was significant ($P < 0.05$). **Conclusion:** Tetracaine hydrochloride 0.5% is an effective option for topical anesthesia for small-incision cataract surgery.

Key words: Tetracaine hydrochloride, topical anesthesia, small-incision cataract surgery.

Corresponding author: Satya Prakash Singh, Assistant Professor, Department of Ophthalmology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

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INTRODUCTION

Cataract surgery is a common and relatively safe surgical procedure performed to treat cataracts, which are the clouding of the natural lens in the eye. The surgery involves removing the cloudy lens and replacing it with an artificial intraocular lens (IOL). Cataract surgery is typically recommended when the clouding of the lens causes significant visual impairment, leading to difficulties with daily activities such as reading, driving, or recognizing faces.¹

The most popular type of anesthetic for regular cataract extraction has been topical since the early 1990s, when small-incision cataract surgery became widely used.² It has numerous benefits over injectable anesthetic, including peribulbar, sub-Tenon's, retrobulbar, and subconjunctival. In addition to having a quicker, less painful application process, quicker anesthetic effect, better patient satisfaction, and a quicker rate of functional recovery following surgery, topical anesthesia also comes with fewer dangers than injectable anesthesia.³

The three primary methods used to apply topical anesthesia during cataract surgery are topical gel, eyedrops, and eyedrops combined with an additional

intracameral drug. A gel preparation offers a theoretical benefit over drops due to its viscosity, which allows for longer contact with the ocular surface.⁴ The present study was conducted to compare the anesthetic efficacy of tetracaine hydrochloride 0.5% versus lidocaine 2% jelly in cataract surgery.

MATERIALS & METHODS

The present study consisted of 58 patients with cataract of both genders. All patients gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 29 each. Group I patients received tetracaine hydrochloride 0.5% and group II received lidocaine 2% jelly, applied once, approximately 5 minutes before surgery. All patients underwent cataract surgery by clear corneal phacoemulsification. Parameters such as postoperative pain score and the need for supplemental anesthesia were recorded. The grading scale was as follows: 0= no pain/discomfort; 1= mild pain/discomfort; 3= moderate pain/discomfort; 5= severe pain/discomfort. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Agent	tetracaine hydrochloride 0.5%	lidocaine 2% jelly

M:F	19:10	15:14
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Table I shows that group I had 19 males and 10 females and group II had 15 males and 14 females.

Table II Comparison of pain score

Pain score	Group I	Group II	P value
Score 0	7	10	0.82
Score 1	9	5	
Score 2	5	4	
Score 3	4	2	
Score 4	3	5	
Score 5	1	3	

Table II, graph I show that score 0 was seen in 7 in group I and 10 in group II, score 1 in 9 and 5, score 2 in 5 and 4, score 3 in 4 and 2, score 4 in 3 and 5 and score 5 in 1 patient and 3 patients respectively. The difference was non-significant (P>0.05).

Graph I Comparison of pain score

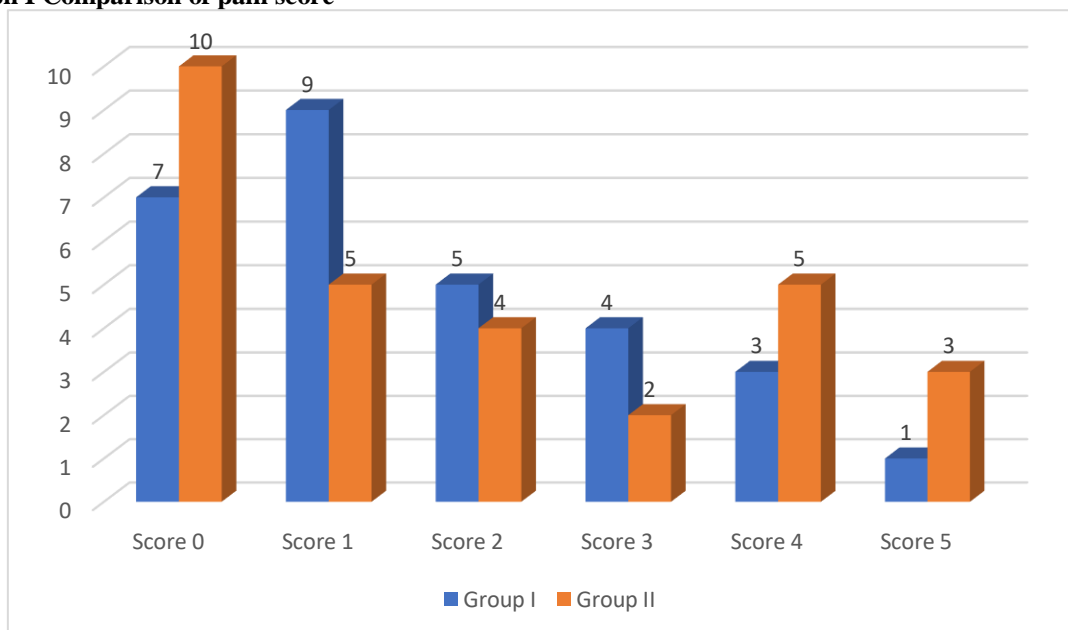


Table III Need for supplemental anesthesia

Supplemental anesthesia	Number	P value
Group I	1	0.01
Group II	3	

Table III shows that 1 patient in group I and 3 in group II required supplemental anesthesia. The difference was significant (P<0.05).

DISCUSSION

Cataract surgery is typically performed under local anesthesia, which may involve eye drops or a small injection around the eye to numb the area. In some cases, general anesthesia may be used. Phacoemulsification is the most common method used for cataract removal. The surgeon makes a small incision in the cornea, then uses ultrasonic energy to break up the cloudy lens, which is then suctioned out.⁶ The extracapsular cataract extraction (ECCE) technique involves removing the entire lens in one piece. In intraocular lens (IOL) Implantation, once the natural lens is removed, an artificial intraocular lens is implanted in its place. There are various types of IOLs, including monofocal, multifocal, and toric

lenses. The choice of lens depends on the patient's vision needs and lifestyle.⁷ The present study was conducted to compare the anesthetic efficacy of tetracaine hydrochloride 0.5% versus lidocaine 2% jelly in cataract surgery.

We found that group I had 19 males and 10 females and group II had 15 males and 14 females. Amiel et al⁸ assessed the anesthetic efficacy of tetracaine hydrochloride 0.5% (TetraVisc) versus lidocaine 2% jelly in routine cataract extraction. Patients were randomized to receive TetraVisc or lidocaine 2% jelly, applied once, approximately 5 minutes before surgery. The mean self-reported postoperative pain scores for TetraVisc and lidocaine 2% jelly were similar (0.94 and 1.02, respectively; P=.76). A single

patient in the lidocaine group required supplemental anesthesia.

We found that score 0 was seen in 7 in group I and 10 in group II, score 1 in 9 and 5, score 2 in 5 and 4, score 3 in 4 and 2, score 4 in 3 and 5 and score 5 in 1 patient and 3 patients respectively. Koch et al⁹ determined whether lidocaine 2% jelly is an effective topical anesthetic agent for cataract surgery. 180 cataract surgery patients were randomly assigned to 1 of 4 groups of 45 patients each: Group 1-topical eyedrop anesthesia; Group 2-intracameral lidocaine; Group 3-lidocaine 2% jelly applied once, on arrival at the surgicenter; and Group 4-lidocaine 2% jelly applied on arrival and about 5 minutes prior to surgery. Each patient was asked about pain or pressure sensation during the operation and afterward. Single instillation of lidocaine 2% jelly was associated with pain scores comparable to those with topical eyedrop anesthesia. When the jelly was readministered shortly before surgery, the pain scores were comparable to those with intracameral anesthesia.

We observed that 1 patient in group I and 3 in group II required supplemental anesthesia. Bardocci et al¹⁰ compared lidocaine 2% jelly and lidocaine 4% unpreserved drops and found the gel preparation had higher levels in the anterior chamber, provided better anesthesia during tissue manipulation, and resulted in overall lower patient-reported postoperative pain. Gill et al¹¹ determined whether intraoperative unpreserved lidocaine further decrease discomfort or pain during sutureless small incision cataract surgery and intraocular lens (IOL) implantation under topical anesthesia. Patients were randomized to receive 0.1 cc unpreserved lidocaine 1% or 0.1 cc balanced salt solution (BSS) (control group). Study drugs were injected intracamerally 1 minute before phacoemulsification. A predefined uniform pain/discomfort scale was used for assessment during phacoemulsification and IOL insertion. A secondary study using a 0.5 cc dose was also performed. percent in the control group and 9% in the lidocaine group had discomfort pain scores of 2 or more; 10% in the BSS group felt increased pressure or pain during phacoemulsification. In the lidocaine group, discomfort was felt mainly during IOL insertion, possibly as a result of wound manipulation. During phacoemulsification, no patient in the 26% lidocaine group reported pain; 2% felt increased pressure during

phacoemulsification. A dose increase to 0.5 cc reduced any intraocular sensation to 3% in the lidocaine group. No patient in either group had significant cell loss or adverse events.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that tetracaine hydrochloride 0.5% is an effective option for topical anesthesia for small-incision cataract surgery.

REFERENCES

1. Patel BCK, Clinch TE, Burns TA, et al. Prospective evaluation of topical versus retrobulbar anesthesia: a converting surgeon's experience. *J Cataract Refract Surg* 1998; 24:853–860.
2. Virtanen P, Huta T. Pain in scleral pocket incision cataract surgery using topical and peribulbar anesthesia. *J Cataract Refract Surg* 1998; 24: 1609–1613.
3. Bellucci R. Anesthesia for cataract surgery. *Curr Opin Ophthalmol* 1999; 10:36–41.
4. Fichman RA. Use of topical anesthesia alone in cataract surgery. *J Cataract Refract Surg* 1996; 22:612–614.
5. Garcia A, Loureiro F, Lima A, et al. Preservative-free lidocaine 1% anterior chamber irrigation as an adjunct to topical anesthesia. *J Cataract Refract Surg* 1998; 24:403–406.
6. Roman S, Auclin F, Ullern M. Topical versus peribulbar anesthesia in cataract surgery. *J Cataract Refract Surg* 1996; 22:1121–1124.
7. MacLean H, Burton T, Murray A. Patient comfort during cataract surgery with modified topical and peribulbar anesthesia. *J Cataract Refract Surg* 1997; 23:277–283.
8. Amiel H, Koch PS. Tetracaine hydrochloride 0.5% versus lidocaine 2% jelly as a topical anesthetic agent in cataract surgery: comparative clinical trial. *Journal of Cataract & Refractive Surgery*. 2007 Jan 1;33(1):98-100.
9. Koch PS. Efficacy of lidocaine 2% jelly as a topical agent in cataract surgery. *Journal of Cataract & Refractive Surgery*. 1999 May 1;25(5):632-4.
10. Bardocci A, Lofoco G, Perdicaro S, et al. Lidocaine 2% gel versus lidocaine 4% unpreserved drops for topical anesthesia in cataract surgery; a randomized controlled trial. *Ophthalmology* 2003; 110:144–149.
11. Gills JP, Cherchio M, Raanan MG. Unpreserved lidocaine to control discomfort during cataract surgery using topical anesthesia. *J Cataract Refract Surg* 1997; 23:545–550.