Original Research

A Comparison Of Proparacaine Hydrochloride Topical Drop And Intracameral 0.5% Lignocaine For Phacotrabeculectomy In Patients With Primary Open Angle Glaucoma

[1]Dr. Kinjalben Patel, [2]Dr. Pratik Dipakbhai Gandhi, [3]Dr. Aakash Vinodchandra Trivedi, [4]Dr. Bhoot Alka Hasmukhbhai

Assistant Professor, Dept. of Anaesthesia , ICARE Institute of Medical Sciences and Research & Dr Bidhan Chandra Roy Hospital, Haldia, West Bengal, India.
[2]Associate Professor, Dept. Of Ophthalmology, KM Medical College and Hospital, Mathura, UP, India.
[3]Assistant Professor, Dept. of Anaesthesia, ICARE Institute of Medical Sciences and Research & Dr Bidhan Chandra Roy Hospital, Haldia, West Bengal, India.
[4]Assistant Professor, Dept. Of Anaesthesia, KM Medical College and Hospital, Mathura, UP, India
Corresponding Author
Dr. Bhoot Alka Hasmukhbhai
Assistant Professor, Dept. Of Anaesthesia, KM Medical College and Hospital, Mathura, UP, India

Received 12 November 2021 Accepted 15 December 2021

ABSTRACT
Background: Topical anesthetic is frequently utilized in vitrectomy, cataract, glaucoma, and combination cataract and glaucoma procedures. The present study was conducted to compare proparacaine hydrochloride topical drop and intracameral 0.5% lignocaine for phacotrabeculectomy in patients with primary open angle glaucoma.
Materials & Methods:88 patients with primary open angle glaucoma scheduled for Phacotrabeculectomy of both genderswere divided into 2 groups of 44 each. Group I patients received proparacaine 0.5% eye drops and group II patients received 1% intracameral lignocaine just prior to phacotrabeculectomy and 0.5% intracameral lignocaine after completion of phacoemulsification just prior to trabeculectomy. The visual analogue scale, and surgeon discomfort were noted.
Results: Group I had 24 males and 20 females and group II had 21 males and 23 females. In group Iand group II, posterior capsular rent was seen in 1 and 1, recurrent iris prolapsein 2 and 1, zonular dehiscence in 1 and 2, inadvertent eye movement in 12 and 10, eye lid squeezing in 7 and 6 and supplemental anesthesia in 16 and 14 patients. The difference was significant ($P< 0.05$). Grade 0 was seen in 24 in group I and 25 in group II, grade 1 in 10 and 11, grade 2 in 6 and 5 and grade 3 in 4 and 3 patients respectively. The difference was significant ($P< 0.05$).
Conclusion: After phacoemulsifying the nucleus, a skilled surgeon can conduct phacotrabeculectomy using topical proparacaine supplemented with 0.5% intracameral lignocaine. Both anesthetic approaches provide a safe and comfortable surgical environment while avoiding injection-related risks of retrobulbar or peribulbar anesthesia.
Keywords: cataract, glaucoma, phacotrabeculectomy

Introduction

Topical anesthetic is frequently utilized in vitrectomy, cataract, glaucoma, and combination cataract and glaucoma procedures.[1] Ophthalmologists choose topical anesthesia due to its quick recovery of visual function, convenience of administration, and lack of injection-related anesthetic drug problems.[2,3] Some of the drawbacks of topical anesthesia are its brief duration of action, need for repeated administration, intraoperative replenishment through intracameral lignocaine or subconjunctival or subtenon injection, and patient discomfort during surgery.[4,5]

Several types of topical anesthetic have been tried for phacotrabeculectomy. These consist of intracameral lignocaine 1% in combination with tetracaine and oxybuprocaine topical drops, lignocaine 2% jelly, and recurrent treatment of 2% lignocaine drops.[6] There have also been attempts to inject ocular anesthetic, such as subtenon and subconjunctival *perilimbal* anesthesia, without impairing ocular movements.[7] However, subtenons or subconjunctival injections of anesthetic drugs may result in subconjunctival bleeding, chemosis, or globe perforation. It has been believed that subconjunctival lignocaine is linked to thin-walled and cystic blebs utilized for trabeculectomy.[8]The present study was conducted to compare proparacaine hydrochloride topical drop and intracameral 0.5% lignocaine for phacotrabeculectomy in patients with primary open angle glaucoma.

Materials & Methods

The study was carried out on 88 patients with primary open angle glaucoma scheduled for Phacotrabeculectomy of both genders. All 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 44 each. Group I patients received proparacaine 0.5% eye drops and group II patients received 1% intracameral lignocaine just prior to phacotrabeculectomy and 0.5% intracameral lignocaine after completion of phacoemulsification just prior to trabeculectomy. The visual analogue scale was used to record intraoperative and postoperative pain. Patient comfort, intraoperative painful sensations perceived by the patient, supplemental anesthesia, complications, and surgeon discomfort were noted. Results 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	proparacaine 0.5% eye drops	1% intracameral lignocaine
M:F	24:20	21:23

Table I shows that group I had 24 males and 20 females and group II had 21 males and 23 females.

Table: II Assessment of parameters

Parameters	Group I	Group II	P value
Posterior capsular rent	1	1	0.62
Recurrent iris prolapse	2	1	
Zonular dehiscence	1	2	
Inadvertent eye movement	12	10	
Eye lid squeezing	7	6	
Supplemental anesthesia	16	14	

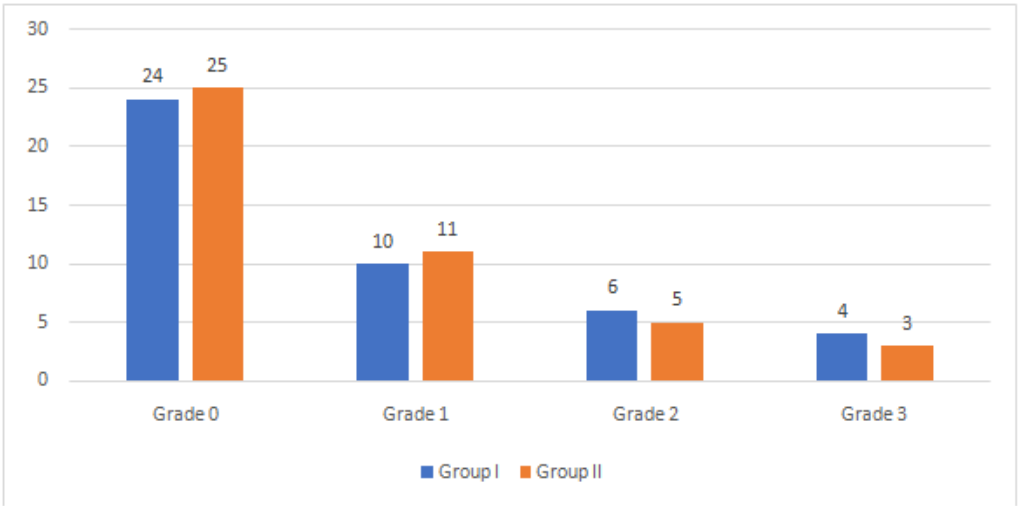
Table II shows that in group I and group II, posterior capsular rent was seen in 1 and 1, recurrent iris prolapse in 2 and 1, zonular dehiscence in 1 and 2, inadvertent eye movement in 12 and 10, eye lid squeezing in 7 and 6 and supplemental anesthesia in 16 and 14 patients.The difference was significant (P< 0.05).

Table III Assessment of surgeon's discomfort

Surgeon's discomfort	Group I	Group II	P value
Grade 0	24	25	0.72
Grade 1	10	11	
Grade 2	6	5	
Grade 3	4	3	

Table III, graph I shows that grade 0 was seen in 24 in group I and 25 in group II, grade 1 in 10 and 11, grade 2 in 6 and 5 and grade 3 in 4 and 3 patients respectively. The difference was significant (P< 0.05).

Graph: I Assessment of surgeon's discomfort



Discussion

It is common for cataract and glaucoma to coexist. Patients may eventually need cataract surgery because trabeculectomy alone causes cataractous alterations.[9] Thus, in order to increase visual acuity and lower intraocular pressure in a single session, cataract and glaucoma operations are commonly combined. There is very little manipulation of pain-sensitive intraocular structures and the introduction of clear corneal phacoemulsification.[10] Phacoemulsification can be carried out while anesthetic drops are applied topically. Trabeculectomy, on the other hand, entails performing peripheral iridectomy and cauterization of the episcleral arteries, which may cause pain for the patient.[11] Additional anesthetic is necessary at this point in the surgical procedure. Rather than administering intracameral lignocaine at the start of surgery, we think it is beneficial for pain management during the iridectomy stage.[12]The present study was conducted to compare proparacaine hydrochloride topical drop and intracameral 0.5% lignocaine for phacotrabeculectomy in patients with primary open angle glaucoma.

We found that group I had 24 males and 20 females and group II had 21 males and 23 females. Lai et al[13]studied the safety and efficacy of topical anesthesia alone, without systemic sedation, in phacotrabeculectomy for cataract and primary open-angle glaucoma.Twenty-two eyes of 22 consecutive patients were included in the study. The mean intraoperative pain score was 0.9 (range, 0-3). Three patients reported discomfort intraoperatively. No injection of supplementary anesthetic was required in any of the eyes. None of the patients had significant increase of pulse rate or blood pressure during the whole surgical procedure. Six patients required oral analgesic for postoperative discomfort. The mean preoperative medically treated IOP was 20.3 +/- 5.9 mm Hg and the mean postoperative IOP at 3 months was 14.4 +/- 4.7 mm Hg. All except two patients had improved visual acuity. There was no serious intraoperative or postoperative complication.

We found that In group I and group II, posterior capsular rent was seen in 1 and 1, recurrent iris prolapse in 2 and 1, zonular dehiscence in 1 and 2, inadvertent eye movement in 12 and 10, eye lid squeezing in 7 and 6 and supplemental anesthesia in 16 and 14 patients.Joshi et al[14]compared the efficacy and safety of 0.5% intracameral lignocaine to 1% intracameral lignocaine prior to phacotrabeculectomy. This study was comprised of 79 patients (79 eyes) with primary open angle glaucoma scheduled for phacotrabeculectomy. Patients were assigned to 1 of 2 Groups receiving proparacaine 0.5% eye drops and 1% intracameral lignocaine just prior to phacotrabeculectomy (Group 1, n = 39) and 0.5% intracameral lignocaine after completion of phacoemulsification just prior to trabeculectomy (Group 2, n = 40). There was no significant difference in the intraoperative pain score (P = 0.0733) or supplemental anesthesia (P = 0.372) between Groups. Postoperative pain score was statistically significant in Group 2 (P < 0.0001). The overall operating conditions in both Groups were comparable (P = 0.7389). A greater number of patients in Group 2 (88.57%) preferred the same anesthetic technique for combined surgery in the fellow eye. There was no difference in inadvertent eye movements and lid squeezing between Groups and they did not interfere with surgery

We found that grade 0 was seen in 24 in group I and 25 in group II, grade 1 in 10 and 11, grade 2 in 6 and 5 and grade 3 in 4 and 3 patients respectively. Lai JS et al[15]studied the safety and efficacy of intracameral lidocaine as anaesthesia in trabeculectomy for primary open-angle glaucoma.Trabeculectomy under intracameral anaesthesia using 1% preservative-free lidocaine was performed in 10 patients with primary open-angle glaucoma. Intraoperative pain score, postoperative intraocular pressure (IOP) and endothelial cell count at 3 months were recorded.The mean pain score was 1.70 +/- 1.34. The mean IOP was lowered from 24.60 +/- 8.28 mmHg preoperatively to 14.1 +/- 3.11 mm Hg postoperatively. There was no significant decrease in the mean endothelial cell count 3 months after the surgery (P = 0.375).

The shortcoming of the study is small sample size.

Conclusion

Authors found that after phacoemulsifying the nucleus, a skilled surgeon can conduct phacotrabeculectomy using topical proparacaine supplemented with 0.5% intracameral lignocaine. Both anesthetic approaches provide a safe and comfortable surgical environment while avoiding injection-related risks of retrobulbar or peribulbar anesthesia.

References

1. Stevens JD. A new local anaesthesia technique for cataract extraction by one quadrant sub-Tenon's infiltration. Br J Ophthalmol1992;76:670-4.
2. Dinsmore SC. Drop, then decide approach to topical anesthesia. J Cataract Refract Surg1995;21:666-71.
3. Rebolleda G, Muñoz-Negrete FJ, Gutierrez-Ortiz C. Topical plus intracameral lidocaine versus retrobulbar anesthesia in phacotrabeculectomy: Prospective randomized study. J Cataract Refract Surg2001;27:1214-20.
4. Yepez J, Cedeno de Yepez J, Arevalo JF. Topical anesthesia in posterior vitrectomy. Retina 2000;20:41-5.
5. Carrillo MM, Buys YM, Faingold D, Trope GE. Prospective study comparing lidocaine 2% jelly versus sub-Tenon's anaesthesia for trabeculectomy surgery. Br J Ophthalmol2004;88:1004-7.
6. Jacobi PC, Dietlein TS, Jacobi FK. Cataract surgery under topical anesthesia in patients with coexisting glaucoma. J Cataract Refract Surg2001;27:1207-13.
7. Bellucci R, Morselli S, Pucci V, Babighian S. Sub-Tenon's anesthesia for combined cataract and

glaucoma surgery. J Cataract Refract Surg1999;25:606-7.
8. Anderson CJ. Circumferential perilimbal anesthesia for combined cataract glaucoma surgery. Ophthalmic Surg Lasers 1999;30:205-7.
9. Noureddin BN, Jeffrey M, Franks WA, Hitchings RA. Conjunctival changes after subconjunctival lignocaine. Eye (Lond) 1993;7:457-60.
10. Denis P. Cataracts in glaucoma patients. J Fr Ophtalmol2003;26:521-4.
11. Fichman RA. Use of topical anesthesia alone in cataract surgery. J Cataract Refract Surg1996;22:612-4.
12. Patel BC, Burns TA, Crandall A, Shomaker ST, PaceNL, van Eerd A, et al. A comparison of topical and retrobulbar anesthesia for cataract surgery. Ophthalmology 1996;103:1196-203.
13. Lai JS, Tham CC, Lam DS. Topical anesthesia in phacotrabeculectomy. J Glaucoma 2002;11:271-4.
14. Joshi RS. Proparacaine hydrochloride topical drop and intracameral 0.5% lignocaine for phacotrabeculectomy in patients with primary open angle glaucoma. Middle East Afr J Ophthalmol2014;21:210-5.
15. Lai JS, Tham CC, Lam DS. Intracameral lidocaine in trabeculectomy. A preliminary safety and efficacy study. Indian J Ophthalmol2002;50:197-200.