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Original Research

Efficacy of intracameral ropivacaine 0.1% to lignocaine 1.0% in patients undergoing phacoemulsification under augmented topical anesthesia

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ABSTRACT:
Background: Cataract surgeryis among the most performed surgical procedures globally. The present study was conducted to compare the efficacy of intracameral Ropivacaine 0.1% to Lignocaine 1.0% in patients undergoing phacoemulsification under augmented topical anesthesia. **Materials & Methods:**72 patients undergoing cataract surgery of both genderswere divided into 2 groups of 36 each. Group I received 0.1% Ropivacaine and group II received 0.1% lignocaine. Preoperative and postoperative endothelial cell count was done using a specular microscope. **Results:** There were 20 males and 16 females in group I and 17 males and 19 females in group II. The average pre-op IOP was 14.92 mm Hg in group I and 14.31 mm Hg in group II. The difference was non- significant (P> 0.05).LOCS grade I was seen in 14 in group I and 8 in group II, II in 10 and 12, III in 7 and 9 and grade IV in 5 and 7 patients respectively. The difference was significant non- (P> 0.05). The pre-surgery average cell density in group I was 2650.2 and in group II was 2438.6. Post-surgery average cell density in group I was 2548.5 and in group II was 2230.4. The difference was significant non- (P> 0.05). **Conclusion:** Intracameral ropivacaine and lignocaine, both are equally effective in providing analgesia during phacoemulsification.
Key words: Ropivacaine, Lignocaine,Phacoemulsification

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INTRODUCTION

The most prevalent eye surgery, second only to immunization in terms of great and very cost-effective results, is cataract surgery. It is also among the most performed surgical procedures globally.[1] The two most common and similar techniques for removing cataracts and implanting intraocular lenses that offer patients full rehabilitation are phacoemulsification and manual small incision cataract surgery (MSICS).[2] Both procedures can be carried out under topical anesthetic, which is the preferred method because it has less side effects and is more patient-friendly than more modern methods including peribulbar, retrobulbar, sub-tenon, and subconjunctival anesthesia. When intracameral anesthesia is used in conjunction with topical anesthesia (with a solution of lignocaine 0.5–1%), cataract surgery is less painful and more comfortable for the patient.[3]

On the other hand, lignocaine is known to be toxic to the corneal endothelium at certain doses. According to research, ropivacaine is less harmful and more effective at smaller doses than lignocaine when applied topically. Ropivacaine is a safer and equally effective local anesthetic medication for use during intraocular surgery when compared to Lignocaine, a novel anesthetic agent.[4] When employed as an intracameral anesthesia agent, the relative safety of ropivacaine to retinal tissue is also an important consideration because it is well-known that intracameral injections of anesthetic agents have the potential to percolate into the vitreous cavity and induce toxicity to the retina.[5]The present study was conducted to compare the efficacy of intracameral Ropivacaine 0.1%to Lignocaine 1.0% in patients undergoing phacoemulsification under augmented topical anesthesia.

MATERIALS & METHODS

The present study consisted of 72 patients undergoing cataract surgery of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. A carefulophthalmological examination, including Cataract LOCS III grading was done. Patients were divided into 2 groups of 36 each. Group I received 0.1% Ropivacaineand group II received 0.1% lignocaine.Preoperative and postoperative endothelial cell count was done using a specular microscope. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Demographic details

Groups	Group I (0.1% Ropivacaine)	Group II (0.1% lignocaine	P value
M:F	20:16	17:19	0.75
Average Pre-op IOP (mm Hg)	14.92	14.31	0.82

Table I shows that there were 20 males and 16 females in group I and 17 males and 19 females in group II. The average pre-op IOP was 14.92 mm Hg in group I and 14.31 mm Hg in group II. The difference was non-significant (P> 0.05).

Table II Cataract nucleus grading (LOCS)

Cataract nucleus grading (LOCS)	Group I	Group II	P value
I	14	8	0.05
II	10	12	0.81
III	7	9	0.95
IV	5	7	0.73

Table II shows that LOCS grade I was seen in 14 in group I and 8 in group II, II in 10 and 12, III in 7 and 9 and grade IV in 5 and 7 patients respectively. The difference was significant non- (P> 0.05).

Graph I Cataract nucleus grading (LOCS)

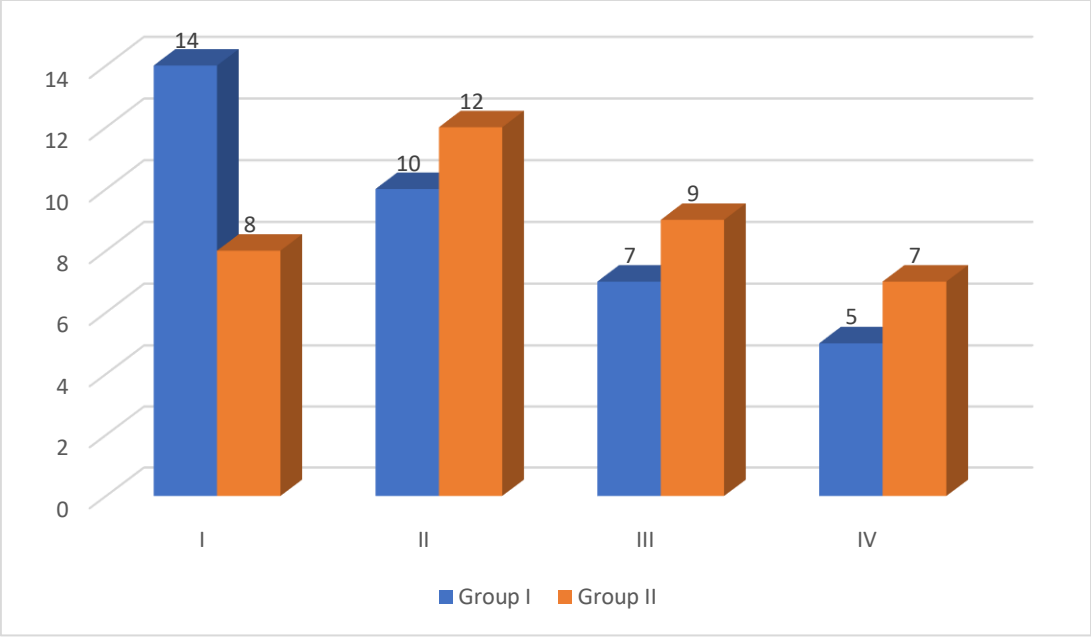
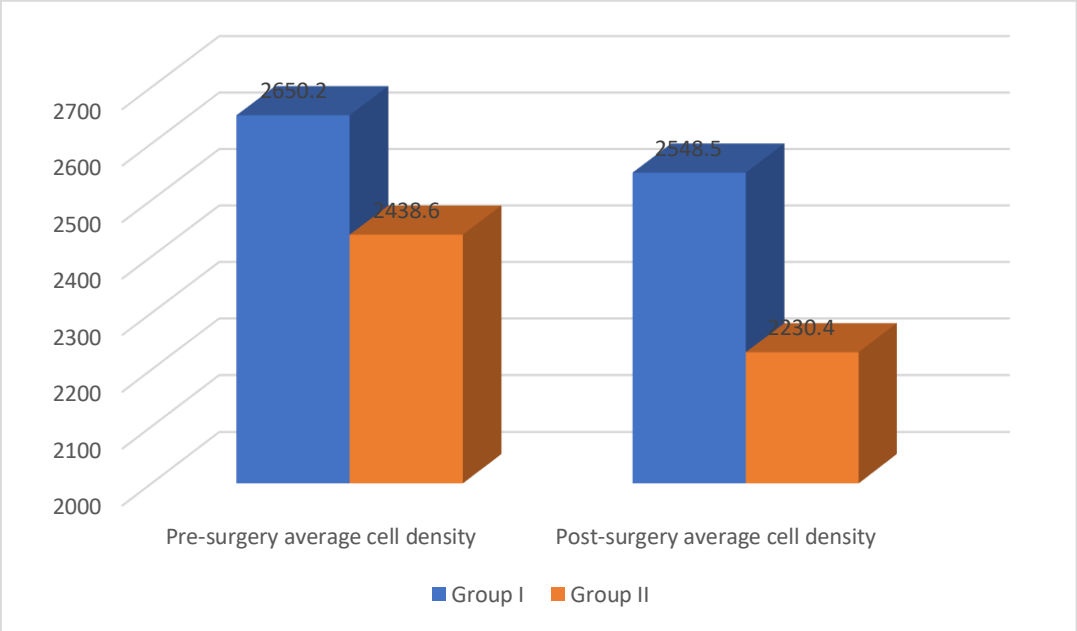


Table III Comparison of endothelial cell density

Endothelial cells/sq mm	Group I	Group II	P value
Pre-surgeryaverage cell density	2650.2	2438.6	0.02
Post-surgeryaverage cell density	2548.5	2230.4	0.01

Table III shows that pre-surgery average cell density in group I was 2650.2 and in group II was 2438.6. Post-surgery average cell density in group I was 2548.5 and in group II was 2230.4. The difference was significant non- (P> 0.05).

Graph I Comparison of endothelial cell density



DISCUSSION

Cataract is defined as loss of transparency of the natural lens and is usually an age-related phenomenon.[6] The only recognized treatment available for cataract involves surgery. An ideal anaesthetic should allow for pain-free surgery with no systemic or local complications.[7] It should be cost effective and should facilitate a stress-free procedure for surgeon and patient alike. Topical anaesthesia involves applying anaesthetic eye drops to the surface of the eye prior to and during surgery.[8,9] This has found large acceptance especially in the USA where it is used by 61% of cataract surgeons. Many surgeons who perform cataract surgery under topical anaesthesia also use intraoperative supplementary intracameral lidocaine (injected directly into the anterior chamber of the eye).[10,11]The present study was conducted to compare the efficacy of intracameral Ropivacaine 0.1% to Lignocaine 1.0% in patients undergoing phacoemulsification under augmented topical anesthesia.

We found that there were 20 males and 16 females in group I and 17 males and 19 females in group II. The average pre-op IOP was 14.92 mm Hg in group I and 14.31 mm Hg in group II. Sharma et al[12]compared intracameral ropivacaine to lignocaine during phacoemulsification under augmented topical anesthesia, in terms of efficacy and safety.Cases were randomized into two groups, group A (Ropivacaine 0.1%) or group B (Lignocaine 1.0%). The pain experienced by the patients during the surgery, mydriasis, post-op inflammation and endothelial cell change at six weeks after the procedure was evaluated. Surgeon's feedback was recorded to evaluate the cooperation of the patient during surgery.A total of 210 subjects were screened and 184 were randomized to have 92 subjects in each group. There was no statistically significant difference seen on comparing Group A and B with respect to Age (P = 0.05), painful surgical steps (P = 0.85), visual analog scale scores (P = 0.65), surgeon's score (P = 0.11), postoperative inflammation (P = 0.90) and average ultrasound time during phacoemulsification (P = 0.10). Subjects in Group A fared better when compared to Group B concerning endothelial cell loss and augmentation in mydriasis

We observed that LOCS grade I was seen in 14 in group I and 8 in group II, II in 10 and 12, III in 7 and 9 and grade IV in 5 and 7 patients respectively. Kashyap et al analyzed[13] ropivacaine and bupivacaine in various parameters during phacoemulsification under deep topical fornix nerve block (DTFNB), a known form of nerve block for phacoemulsification.Patients were divided into two equal groups of fifty patients each, Groups B (bupivacaine) and Group R (ropivacaine). Two sponges, approximately 2 mm × 3 mm dimensions, saturated with either 0.5% bupivacaine or 0.75% ropivacaine were placed deep in the conjunctival fornices to perform the deep topical block. Both groups were evaluated for magnitude of pain and discomfort at various stages of phacoemulsification using a simple pain scoring system. The level of surgeon satisfaction, requirement for supplementary anesthesia, and surgical complications were also evaluated. Overall demographic parameters of patients were similar in both groups. Similar mean pain scores were found in the ropivacaine and bupivacaine groups, with no statistical significance. Surgical satisfaction and the need for supplemental anesthesia were also statistically insignificant.

We found that pre-surgery average cell density in group I was 2650.2 and in group II was 2438.6. Post-surgery average cell density in group I was 2548.5 and in group II was 2230.4. Martini et al[14]assessed the anesthetic efficacy and safety of topical ropivacaine

versus topical lidocaine in cataract surgery.Patients were randomized into 2 groups; 1 received topical ropivacaine 1% and the other, topical lidocaine 4%. The duration of surgery, intraoperative and early postoperative complications, and the need for supplemental intracameral anesthesia were recorded. Intraoperative and postoperative subjective pain was quantified by patients using a scale from 1 to 10. An endothelial cell count was performed preoperatively and 2 months after surgery.The mean endothelial cell density decreased from 2334 cells/mm(2) +/- 496 (SD) to 2016 +/- 674 cells/mm(2) in the ropivacaine group and from 2519 +/- 404 cells/mm(2) to 1847 +/- 607 cells/mm(2) in the lidocaine group. The difference in cell density between groups was not significant before (P =.154) or after surgery (P =.329); however, the difference in mean cell loss between groups was statistically significant (P =.031). The duration of surgery and intraoperative complications were the same in both groups. Four patients in the ropivacaine group and 5 in the lidocaine group required supplemental anesthesia (P >.05). The mean subjective analog pain score was slightly higher in the lidocaine group (P >.05). The day after surgery, 12 eyes in the ropivacaine group and 6 in the lidocaine group had transient corneal edema (P =.150).
The limitation of the study is the small sample size.

CONCLUSION

Authors found that intracameral ropivacaine and lignocaine, both are equally effective in providing analgesia during phacoemulsification.

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