ORIGINAL RESEARCH

Lidocaine 2% jelly versus subTenon's anaesthesia for trabeculectomy surgery- A comparative study

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ABSTRACT

Background: Topical anesthesia using lidocaine 2% jelly is a safe and efficient substitute for phacotrabeculectomy and clear cornea cataract surgery. The present study compared lidocaine 2% jelly and subTenon's anaesthesia for trabeculectomy surgery. **Materials & Methods:** 80 patients scheduled for trabeculectomy of both genderswere divided into 2 groups of 40 each. Group I patients received sub-Tenon's anaesthesia with 2% lidocaine and group II received lidocaine 2% jelly. A standardized sedative including propofol, fentanyl, and/or midazolam was administered to both groups. Intraoperative pain was measured using the visual analogue scale. **Results:** Quantity of midazolam (mg) was 1.8 in group I and 1.6 in group II, quantity of fentanyl (mg) was 51.2 and 43.8, quantity of propofol (mg) was 1.9 and 4.2, intraoperative discomfort (VAS) score was 19.3 and 20.4 and surgeon satisfaction score was 3.8 and 3.9 in group I and II respectively. The difference was non- significant (P> 0.05). Surgical technique used in group I and group II patients was use of MMC was 15 and 17, Limbal based flap in 22 and 19 and Fornix based flap in 3 and 4 patients respectively. The difference was non- significant (P> 0.05). **Conclusion:** For trabeculectomy surgery, topical anesthesia containing 2% lidocaine jelly is just as effective as sub-Tenon's anesthesia. Furthermore, since it avoids injections, which can result in side effects like globe rupture, conjunctival button holes, and subconjunctival hemorrhage, it might be wiser.

Keywords: lidocaine, subTenon'sanesthesia,trabeculectomy

INTRODUCTION

The significance of trabeculectomy (TRAB) as the gold standard of glaucoma procedures is ambiguous in this new era with shunt treatments, newer implants, and non-penetrating glaucoma surgeries.[1] The majority of glaucoma surgeons still choose TRAB as their first option, despite the fact that many practitioners believe it will not be around for long. in patients where the target intraocular pressure (IOP) needed is extremely low, in situations with extensive damage, and in cases that proceed quickly even with the most effective conventional treatment. Several changes have been made to the "trabeculectomy" method, which was first described by Cairns in 1968, in order to improve outflow and ensure long-term success.[2]

Several authors have successfully employed topical anesthesia for ophthalmological surgery, including vitrectomy, trabeculectomy, cataract surgery, and phacotrabeculectomy. Even in the absence of systemic sedation, recent data indicates that topical anesthesia using lidocaine 2% jelly is a safe and efficient substitute for phacotrabeculectomy and clear cornea cataract surgery.[3,4] The jelly has a long-lasting impact while the surgery is being done.In addition to the benefits of not having to put a needle into the orbital cavity, topical anesthetic has specific benefits for individuals undergoing trabeculectomy. Intraocular pressure (IOP) increases during local anesthetic for intraocular surgeries; this effect is more pronounced

in glaucoma patients, whose IOP might rise to 50 mm Hg.[5] Because it may exacerbate pre-existing optic nerve damage, this rise in intraocular pressure is undesirable in glaucoma patients. The acute increase in intraocular pressure that is observed with injectable anesthetic, which is currently used during trabeculectomy, is not induced by topical anesthesia.[6]The present study compared lidocaine 2% jelly andsubTenon's anaesthesia for trabeculectomy surgery.

MATERIALS & METHODS

The study was carried out on 80 patients scheduled for trabeculectomy 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 40 each. Group I patients received sub-Tenon's anaesthesia with 2% lidocaine and group II received lidocaine 2% jelly. A standardized sedative including propofol, fentanyl, and/or midazolam was administered to both groups. Intraoperative pain was measured using the visual analogue scale. Records were kept of the following: the amount of local anesthetic used, the need for further anesthesia, the patient's comfort, the physician's evaluation of the patient's compliance during the procedure, and any complications.Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table IBaseline characteristics

Parameters	Group I	Group II	P value
quantity of midazolam (mg)	1.8	1.6	0.83
quantity of fentanyl (mg)	51.2	43.8	0.05
quantity of propofol (mg)	1.9	4.2	0.02
intraoperative discomfort (VAS)	19.3	20.4	0.17
surgeon satisfaction score	3.8	3.9	0.92

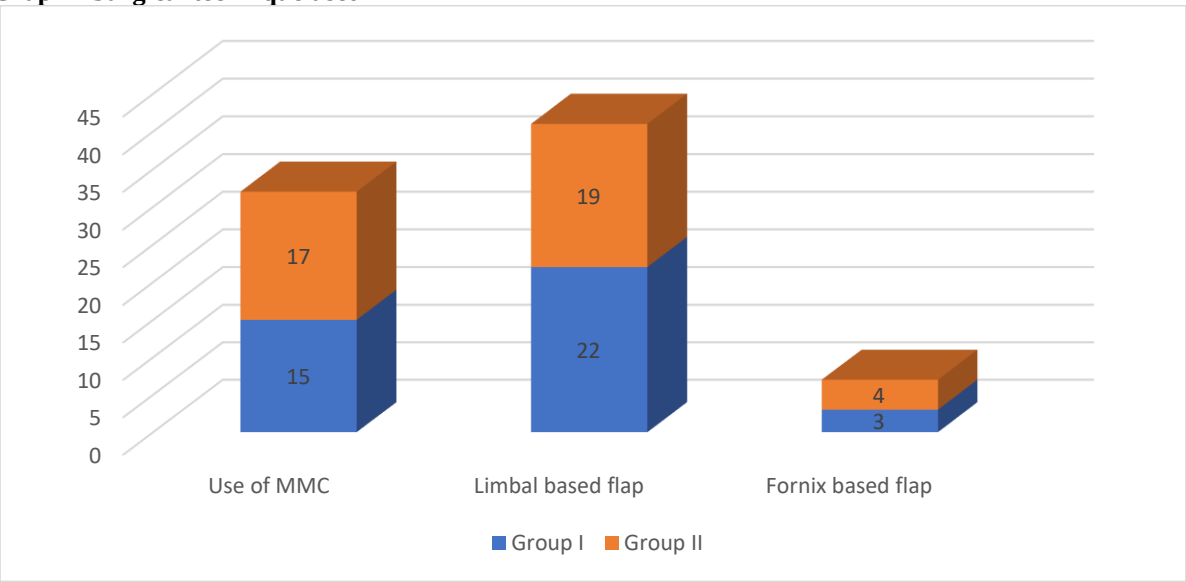
Table I shows that quantity of midazolam (mg) was 1.8 in group I and 1.6 in group II, quantity of fentanyl (mg) was 51.2 and 43.8, quantity of propofol (mg) was 1.9 and 4.2, intraoperative discomfort (VAS) score was 19.3 and 20.4 and surgeon satisfaction score was 3.8 and 3.9 in group I and II respectively. The difference was non-significant (P> 0.05).

Table II Surgical technique used

Surgical technique	Group I	Group II	P value
Use of MMC	15	17	0.75
Limbal based flap	22	19	
Fornix based flap	3	4	

Table II, graph I shows that surgical technique used in group I and group II patients was use of MMC was 15 and 17, Limbal based flap in 22 and 19 and Fornix based flap in 3 and 4 patients respectively. The difference was non-significant (P> 0.05).

Graph I Surgical technique used



DISCUSSION

Several studies have demonstrated the ease and safety of subTenon's anaesthesia not only for trabeculectomybut also for cataract surgery.[7,8] This technique, however, involves injection of anaesthetic with a sharp needle or blunt cannula which may result in complications such as subconjunctival haemorrhage, chemosis, conjunctival injectionholes, and even globe perforation.[9,10] A potential advantage of sub-Tenon's anaesthesia is in cases of re-operation where the infiltration of anaesthetic fluid separates Tenon's capsule and conjunctiva from episclera, thus allowing the surgeon to check for conjunctival mobility when choosing a site for surgery.[11,12]The early return of visual acuity without the risks of injection complications (chemosis, optic nerve injury, globe perforation, retinal detachment, diplopia, ptosis, periocular ecchymosis, increased orbital pressure, injection into the subarachnoid space, respiratory arrest from brain stem anesthesia, subconjunctival and retrobulbar hemorrhage, etc.) is one benefit of topical anesthesia.[13]The present study compared lidocaine 2% jelly and subTenon's anaesthesia for trabeculectomy surgery.

We found that quantity of midazolam (mg) was 1.8 in group I and 1.6 in group II, quantity of fentanyl (mg) was 51.2 and 43.8, quantity of propofol (mg) was 1.9 and 4.2, intraoperative discomfort (VAS) score was 19.3 and 20.4 and surgeon satisfaction score was 3.8 and 3.9 in group I and II respectively. Carrillo et al[14]compared the analgesic properties of lidocaine 2% jelly versus sub-Tenon's anaesthesia with lidocaine 2% without adrenaline (epinephrine) for trabeculectomy surgery. 59 consecutive patients scheduled for trabeculectomy were randomly assigned to topical unpreserved lidocaine 2% jelly or sub-Tenon's anaesthesia with 2% lidocaine. Both groups received a standardised sedative consisting of midazolam, fentanyl. and/or propofol. The visual analogue scale was utilised to measure intraoperative pain. Patient comfort, physician assessment of intraoperative patient compliance, volume of local anaesthetic used, need for supplemental anaesthesia, and any complications were recorded. The sub-Tenon's anaesthesia group and the lidocaine 2% jelly group did not vary significantly in subjective pain score (18.3 (SD 16.2) v 19.8 (12.4) respectively, p = 0.739) and surgeons' satisfaction scale (3.6 (0.7) and 3.8 (0.6) respectively, p = 0.328). Four patients required additional anaesthesia, all of them in the sub-Tenon's group.

We found that surgical technique used in group I and group II patients was use of MMC was 15 and 17, Limbal based flap in 22 and 19 and Fornix based flap in 3 and 4 patients respectively.Bardocci A et al[15] compared intracameral levels and clinical efficacy of lidocaine 2% gel with lidocaine 4% unpreserved drops.Patients were randomly assigned to receive 20 mg of lidocaine either as lidocaine 2% gel (1 ml) or as lidocaine 4% unpreserved eyedrops (0.5 ml) before clear corneal phacoemulsification.Aqueous samples were taken to measure lidocaine intraocular levels. Intraoperative pain was quantified a few minutes after surgery using a 0 to 10 visual analog scale.Patients were asked to grade the degree to which they were bothered by tissue manipulation. The surgeon graded patients' cooperation. The anesthesiologist recorded any increase in pulse or blood pressure and the need for supplemental topical anesthesia or intravenous sedation. Duration of surgery and intraoperative complications were also recorded.In the gel group intracameral lidocaine levels were significantly higher ($P < 0.001$) and patient-reported intraoperative pain scores were significantly lower ($P = 0.026$). Patients in the gel group were bothered by tissue manipulation to a lesser extent ($P = 0.028$), and their cooperation was better ($P = 0.002$). Increases in blood pressure were more frequent in the eyedrops group. Supplemental anesthesia was required in two cases (3.70%) in the gel group versus eight cases in the eyedrops group (15.09%). No correlation between intracameral lidocaine levels and intraoperative pain scores was found ($r = -0.026$, $P = 0.789$).

Bellucci R et al[16]evaluated the intraocular penetration of lidocaine 4% topically applied before phacoemulsification.Thirty eyes having phacoemulsification for senile cataract were anesthetized by topical application of lidocaine 4%. The drug was applied 3 times in 30 minutes in 15 eyes and 6 times in 60 minutes in 15 eyes. At the beginning of surgery, aqueous humor samples were obtained to measure the lidocaine levels. Blood samples were obtained in 6 patients 30 and 60 minutes after aqueous humor collection. The aqueous humor levels were compared with the amount of pain perceived by patients during surgery.Mean aqueous humor lidocaine concentration was 8.68 micrograms/mL +/- 2.43 (SD) after 3 instillations and 23.21 +/- 8.87 micrograms/mL after 6 instillations. Blood levels of lidocaine were negligible. Patients whose intraocular level was below 12 micrograms/mL perceived more pain during surgery. Only 2 eyes had these low levels after 6 instillations.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that for trabeculectomy surgery, topical anesthesia containing 2% lidocaine jelly is just as effective as sub-Tenon's anesthesia. Furthermore, since it avoids injections, which can result in side effects like globe rupture, conjunctival button holes, and subconjunctival hemorrhage, it might be wiser.

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