



A COMPARATIVE STUDY OF TOPICAL VERSUS PERIBULBAR ANESTHESIA IN MANUAL SMALL INCISION CATARACT SURGERY

Dr. Antariksh Mohta*	Resident In Ophthalmology Department, D. Y. Patil Hospital And Research Institute, Kolhapur. *Corresponding Author
Dr. Pradeep Dindore	Ex-Associate Professor Department Of Ophthalmology, D. Y. Patil Hospital And Research Institute Kolhapur
Dr. Mahesh Dalvi	Ex-Associate Professor Department Of Ophthalmology , Government Medical College, Kolhapur
Dr. Milind Sabnis	HOD And Professor Department Of Ophthalmology , D. Y. Patil Hospital And Research Institute, Kolhapur

ABSTRACT **Aim:** To compare topical anaesthesia with peribulbar anaesthesia in manual small incision cataract surgery
Materials & methods: 100 patients were taken into study out of which 50 were given topical anaesthesia (group A) and 50 were given peribulbar anaesthesia (group B). Preoperative and intraoperative blood pressure, pulse were measured. Pain was assessed at the time of giving anaesthesia in both groups using Wong Baker Faces Pain Rating Scale.
Results: There was no significant difference in preoperative and intraoperative blood pressure and pulse between two groups. In Group B there was significant reduction in intraoperative pulse and systolic blood pressure as compared to preoperative. More number of patients suffered pain in Group B as compared to Group A.
Conclusion: Cataract surgery can be safely performed with topical anaesthesia with minimal pain and suffering to patients and no complication with good visual outcome

KEYWORDS : Topical, Peribulbar, Anaesthesia, Topical Versus Peribulbar Anesthesia

INTRODUCTION

Recently cataract surgeries have become more advanced and there is better visual outcome with improved safety. New techniques like smaller corneal or limbal incision, lens extraction by phacoemulsification, foldable intraocular lens^[1,2,3,4] have made shift from local anaesthesia to topical anaesthesia.^[5,6] Local anaesthesia includes peribulbar, retrobulbar, sub tenon's^[7,8,9,10], topical anaesthesia.^[11,12,13] Peribulbar anaesthesia has been used since more than 100 years with various modification to prevent injury to intra-orbital structures.^[14] Koller was first to use cocaine as topical anaesthesia in 1884.^[15] Topical anaesthesia is newer method used for cataract surgery. Advantages of topical being easy application, less discomfort and most importantly reduced intra orbital structure injury which is associated with peribulbar anaesthesia.^[11]

There are various studies with different results when topical and peribulbar anaesthesia are compared.^[16,17,18]

MATERIALS and METHODS

Patients were randomly selected into two groups, Group A- topical anaesthesia Group B- peribulbar anaesthesia. Written informed consent was taken from all the patients.

Patients in topical group were treated with 0.5% proparacaine hydrochloride, 10 min before surgery and just prior to corneal incision. Peribulbar block (Diffusing agent hyalidase was added to the combination of 2% lignocaine hydrochloride and adrenaline in concentration of 1:200000), 5ml of total 2% lignocaine with adrenalin pre mixed with 1500U hyalidase and 0.75% bupivacaine. A 25 gauge 2.5cm disposable needle is attached to the syringe. The patient is placed in supine position and asked to look straight ahead, the needle is inserted transconjunctival or transcutaneously at the junction of the medial two third and lateral one third of the lower lid adjacent and parallel to orbital floor for about 2.5cm, gentle aspiration of the needle is performed to know possible entry of needle into the blood vessel and then 5 ml of the mixture injected into the lateral adipose tissue of the orbit that is in peripheral space. Pressure is applied for couple of minutes subsequently. Then same needle is inserted in depth of 2.5 cm at supraorbital notch and further 3 ml of the mixture is injected, after that pressure is applied for couple of minutes. The two groups did not vary in age, intraocular pressure, optic nerve head changes, ARMD changes. Duration of surgery and intraoperative complication were noted for each patients in both groups. Patients preoperative and intraoperative blood pressure, pulse and pain (according to Wong Baker Faces Pain Rating Scale) was observed. Wong Baker Faces

Pain Rating Scale is scale to assess the pain from age of 3 years. Below is image showing the scale. Expression of the patients is matched with the Wong-Baker FACES and pain scale is assessed.



Data will analysed by using 'Graphpad Instat Quickcal' software. Quantitative variable are compared by using Unpaired t-test ($P < 0.05$) is considered statistically significant. *(asterisk sign) shows statistical significance. Qualitative variables are compared by using Z-test for proportion ($p < 0.05$) is considered statistically significant.

INCLUSION

1. All patients having of senile cataract with significant diminution of vision, who underwent manual small incision cataract surgery
2. Patients willing to give written informed consent

EXCLUSION

1. Cases of old iridocyclitis, previous ocular diseases like blepharitis and acute external infection, glaucoma
2. Patients allergic to xylocaine.
3. Patient with past history of long term local or systemic steroids use as which would affect healing of wound.
4. Patients with complex ocular anterior segment disease
5. Anxious patients
6. Patients with nystagmus and poor fixation
7. Patient on antipsychotics

RESULTS

Total of 100 patients underwent manual small incision cataract surgery. 50 patients were given topical anaesthesia and 50 were given peribulbar anaesthesia which were randomly selected. There was no statistical difference in duration of surgery, intra operative complication, blood pressure. No patients were lost due to any complication like cardiac arrest. Anaesthesia related complication was seen only in patients given peribulbar anaesthesia which included subconjunctival haemorrhage, ecchymosis, chemosis.

TABLE 1. Showing age distribution in males and female in Group A

Age in years	Males	Female
50-60	7	12
61-70	16	8
71-80	3	3
81-90	1	-

TABLE2. Showing age distribution in males and female in Group B

Age in years	Males	Female
50-60	12	11
61-70	9	8
71-80	4	5
81-90	1	-

TABLE 3. Showing preoperative and intraoperative systolic, diastolic blood pressure and pulse in patient given topical anaesthesia.

	Preoperative	Intraoperative	p-value
Systolic blood pressure(mmHg)	133.6±9.20	134±10.88	P=0.84
Diastolic blood pressure(mmHg)	83.2±6.833	84.32±6.50	P=0.40
Pulse per minute	77±12.17	76.74±1.04	P=0.91

By using unpaired-t test for comparing means, there is no significant difference observed in means of preoperative systolic and diastolic blood pressure ,pulse and intra-operative systolic and diastolic blood pressure .pulse.

TABLE 4.Showing preoperative and intraoperative systolic, diastolic blood pressure and pulse in patient given peribulbar anaesthesia.

	Preoperative	Intraoperative	p-value
Systolic blood pressure(mmHg)	136.8±14.20	130.8±10.85	P=0.019**
Diastolic blood pressure(mmHg)	82.8±7.57	83.48±6.86	P=0.63
Pulse per minute	76.74±13.04	70.24±9.22	P=0.005**

By using unpaired-t test for comparing means, there is significant difference observed in means of mean preoperative systolic blood pressure and mean intra operative systolic blood pressure which is statistically significant (p=0.019**) , also there is significant difference observed in means of mean preoperative pulse and mean intraoperative pulse which is statistically significant (p=0.005**)at 5% of level significance. These is no statistical difference in preoperative and intra operative diastolic blood pressure.

Pain assessment at the time of giving anaesthesia by using Wong-Baker Faces Pain Rating Scale in topical anaesthesia and peribulbar anaesthesia is given in Table 4. First column shows Wong-Baker FACES Pain scale and next two column shows number of patients experiencing pain according to the scale.

TABLE 4. Shows number of patients having pain using Wong-baker FACES Pain scale

Wong-Baker FACES Pain scale	Number of patients given Topical Anesthesia (out of 50)	Number of patient given Peribulbar anesthesia (out of 50)
0	45	35
2	4	8
4	1	4
6	0	3
8	0	0
10	0	0
Patient suffered pain i.e. scale greater than 0	5	15

Pain assessment (by using Wong-Baker Faces Pain Rating Scale) in topical anaesthesia showed that 5 out of 50 patients had suffered pain whereas in peribulbar anaesthesia 15 patients out of 50 patients had experienced pain.

By using Z-test for proportion, there is significant difference observed in proportion of patients with pain in topical and peribulbar group (p=0.012**) at 5% level significance which is statistically

TABLE 5.

Total number of patients having pain with topical anaesthesia out of 50	Total number of patients having pain with peribulbar anaesthesia out of 50	p-value
5 (10%)	15(30%)	0.012**

significant. In our study 30% of patients with peribulbar anaesthesia and 10% patients with topical anaesthesia suffered from pain. This indicates that more number of patients experienced pain during the peribulbar anaesthesia than with topical anaesthesia.

DISCUSSION

Anaesthesia for cataract surgery have been performed most commonly by retrobulbar or peribulbar injection of anaesthesia. These methods carry risk of accidental perforation of the globe, retinal vessel occlusion, retrobulbar haemorrhage, optic nerve injury, contralateral visual loss, retinal detachment, cardiopulmonary and respiratory arrest. These complication lead to search of new method of anaesthesia.

The three most common method of topical anaesthesia are gel form, eye drops with intra-cameral injection with lidocaine, eye drops alone^(19,20). Topical anaesthesia anesthetizes trigeminal nerve of conjunctiva and cornea with intra ocular structures unanaesthetised. Patients discomfort is due to this unanaesthetised intraocular structures like iris ,ciliary body , zonules as they are manipulated during the surgery. Topical anaesthesia is safe and effective for uncomplicated cataract procedures. But due to faster recovery, less of patient discomfort, rapid onset, patient satisfaction and being economical has lead to its use in cataract operations. Topical anaesthesia can be used in high myopic patient having increased antero-posterior length which can cause globe perforation during peribulbar anaesthesia. Topical anaesthesia can be used in patients operated previously for retinal detachments like scleral buckling. Preservation of extraocular movement can help the surgeon to reach inaccessible sites during the surgery.

After comparing the usage topical and peribulbar anaesthesia in manual small incision cataract surgery ,the two methods of anaesthesia did not differ in parameters of blood pressure and pulse rate. The number of patients having discomfort and pain while performing the anaesthetic procedure was more in peribulbar anaesthesia as compared to topical anaesthesia but that did not lead to postponement of the surgery, there were no intraoperative major complication like globe perforation or suprachoroidal hemorrhage nor did it affect the visual outcome after the surgery. We come to the conclusion that cataract surgery can be safely performed under topical anaesthesia.

REFERENCES

- Boyd BF (1975-1976) Personal interview between the editor and RC Troutman, D Paton, S Ryan. Present trends in incision closure of the cataract wound. Highlights Ophthalmol 14: 176-204.
- Fichman RA (1993) The clear-corneal incision and astigmatism strategies. In: Fine IH, Fichman RA, Grabow HB, (eds), Clear-Corneal Cataract Surgery and Topical Anesthesia. Slack, Thorofare, NJ: 72-76.
- Linebarger EJ, Hardten DR, Shah GK, Lindstrom RL (1999) Phacoemulsification and modern cataract surgery. Surv Ophthalmol 44: 123-147.
- Malik A, Fletcher EC, Chong V, Dasan J (2010) Local anesthesia for cataract surgery. J Cataract Refract Surg 36: 133-152.
- FICHMAN RA (2001) Use of topical anesthesia alone in cataract surgery. J Cataract Refract Surg 22: 612-614.
- Gills JP, Cherchio M, Raanan MG (1997) Unpreserved lidocaine to control discomfort during cataract surgery using topical anesthesia. J Cataract Refract Surg 23: 545-550.
- Canavan KS, Dark A, Garrioch MA (2003) Sub-Tenon's administration of local anesthetic: a review of the technique. Br J Anaesth 90: 787-793.
- Gray R, Lucas J (2002) "No needle" sub-Tenon's anesthesia. Br J Ophthalmol 86: 831.
- Greenbaum S (1997) Anesthesia in cataract Surgery. In: Greenbaum S (ed), Ocular Anesthesia. Saunders, Philadelphia, PA: 1-55.
- Hansen EA, Mein CE, Mazzoli R (1990) Ocular anesthesia for cataract surgery: a direct sub-Tenon's approach. Ophthalmic Surg 21: 696-699.
- Claoue C, Lanigan C (1997) Topical anesthesia for cataract surgery. Aust N Z J Ophthalmol 25: 265-268.
- Ezra DG, Allan BD (2007) Topical anaesthesia alone versus topical anaesthesia with intracameral lidocaine for phacoemulsification. Cochrane Database Syst Rev Cd005276.
- Kershner RM (1993) Topical anesthesia for small incision self-sealing cataract surgery. A prospective evaluation of the first 100 patients. J Cataract Refract Surg 19: 290-292.
- Hamilton RC (1985) Brain stem anesthesia following retro bulbar blockade Aesthesiology 63: 688-690 and Hamilton RC, Gimbel HV. Regional anesthesia for 12000 cataract extraction and IOL Can J Anaesth. 1988; 35:615-623.
- Fichman RA (1992) Topical eye drops replace injection for anesthesia. Ocular Surgery News 1: 20-21.
- Sauder G, Jonas JB (2003) Topical versus peribulbar anesthesia for cataract surgery. Acta Ophthalmol Scand 81: 596-599.
- Said K, Hassan M, Qahtani FA (2003) A comparative study of topical versus peribulbar anesthesia in phacoemulsification and implantation of foldable intraocular lens in cataract surgery. IJOVS 2.
- Zehetmayer M, Radax U, Skorpik C, Menapace R, Schemper M, et al. (1996) Topical versus peribulbar anesthesia in clear corneal cataract surgery. J Cataract Refract Surg 22: 480-484.
- Bardocci A, Lofoco G, Perdicaro S, Ciucci F, Manna L (2003) "Lidocaine 2% gel versus lidocaine 4% unpreserved drops for topical anesthesia in cataract surgery: a randomized controlled trial. Ophthalmology 110: 144-149.
- Soliman MM, Macky TA, Samir MK (2004) Comparative clinical trial of topical anesthetic agents in cataract surgery: lidocaine 2% gel, bupivacaine 0.5% drops, and benoxinate 0.4% drops. J Cataract Refract Surg 30: 1716-1720.