



“COMPARISON OF PERIBULBAR ANESTHESIA WITH POSTERIOR SUBTENON'S ANESTHESIA IN MANUAL SMALL INCISION CATARACT SURGERY (MSICS)”

Ophthalmology

Yamini Tulasi R*	Postgraduate, Department of Ophthalmology, Sri Siddhartha Medical College & Research Centre, Tumkur, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka, India. *Corresponding Author
Lokesh H M	Professor, Department of Ophthalmology, Sri Siddhartha Medical College & Research Centre, Tumkur, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka, India.
Nivarani Sagolsem	Postgraduate, Department of Ophthalmology, Sri Siddhartha Medical College & Research Centre, Tumkur, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka, India.

ABSTRACT

Background: Cataract-related blindness is a huge problem in India, not only in terms of human suffering but also in terms of economic loss and social impact. For cataract extraction, retrobulbar anaesthesia was widely employed. Because of its substantial difficulties, retrobulbar anaesthesia was replaced with peribulbar. Despite a two injection method Peribulbar anaesthesia has a very high failure rate. Subtenon's anaesthesia is becoming more popular in this situation, Because of its faster onset in delivering anaesthesia, akinesia and patient compliance. **Methods:** A cross-sectional study in ophthalmology department at Sri Siddhartha Medical College, Tumkur was conducted over a period of 18 months in 150 MSICS participants, with 75 participants in each group. The efficacy and safety of two types of anaesthesia in MSICS were compared in terms of intraoperative analgesia, akinesia, lid movements, and complications. **Results:** Out of 75 participants in each group percentage with grade 0 pain in posterior subtenon's group was 64(83 %) as compared to 6(8%) in peribulbar group. Among all 20 (27%) participants of peribulbar group and 2 (3%) of posterior subtenon's group had attained complete akinesia. Both the groups had experienced similar amount of lid movements. Occurrence of complications like chemosis and sub conjunctival hemorrhage was noted more in posterior subtenon's group when compared to peribulbar group.

KEYWORDS

Cataract, MSICS, peribulbar anaesthesia, posterior subtenon's anaesthesia.

INTRODUCTION:

Cataract-related blindness is a huge concern in a developing nation like India, where our progress is largely based on the availability of labour. The general public favours manual small incision cataract surgery, especially in a nation like ours that offers suture less cataract surgery as a less expensive alternative to phacoemulsification. Cataract extraction is frequently performed under retrobulbar anaesthesia¹. Peribulbar anaesthesia has become an alternative for retrobulbar anaesthesia due to rare but dangerous consequences such as retrobulbar bleeding, globe perforation, and optic nerve injury. However, peribulbar anaesthesia does not completely eliminate significant problems. Even with a two-injection approach, it has an unusually high rate of incomplete blockage and pain. Subtenon's anaesthesia resulted in a faster onset of anaesthesia, improved akinesia, and greater consistency in effectiveness, and improved patient compliance². This study is being conducted to compare efficacy and consequences encountered in MSICS between Posterior subtenon's anaesthesia and peribulbar anaesthesia.

AIM & OBJECTIVES:

- To compare safety and efficacy of posterior subtenon's anaesthesia with peribulbar anaesthesia in MSICS.
- To compare the efficacy of posterior subtenon's anaesthesia and peribulbar anaesthesia with respective to intra operative pain, akinesia, lid movements in MSICS.
- To compare the complications of posterior subtenon's anaesthesia and peribulbar anaesthesia in MSICS

MATERIALS AND METHODS:

Our study is a Hospital based cross sectional study conducted in the Department of ophthalmology Sri Siddhartha Medical College, Tumkur, Karnataka over a period of 18 months from January 2021 to June 2022. A total of 150 participants with cataract who are attending either the eye camps or the outpatient unit of department of ophthalmology who were satisfying the inclusion criteria were enrolled into the study after getting informed consent from participants. Such enrolled subjects, will be evaluated clinically for cataract. Each patient is alternatively allocated into peribulbar and posterior subtenon's groups. All the participants were admitted the day prior to the surgery underwent pre-operative evaluation including a full history of any previous ocular disease or surgery, visual acuity recording by Snellen's charts, Goldman's applanation tonometry and detailed slit lamp examination, funduscopy. General physical and

systemic examination including cardiovascular system and Respiratory system examination, blood pressure recording and blood sugar evaluation was done. Written informed consent was taken from all the participants. Procedures in both the groups were done by single surgeon.

PRE OPERATIVE PREPARATION:

Preoperatively Moxifloxacin 0.5% was instilled hourly one day prior to surgery. Flubiprofen 0.03%, used 2 times in one hour for two hours before surgery and pupil was dilated with tropicamide 0.8% and phenylephrine 5%. Sensitivity to drug is tested with lignocaine test dose.

Procedure for posterior subtenon's Anaesthesia:

The injection is administered to a reclined patient. Topical anaesthetic solution (proparacaine 0.5% eye drops) is used. Eye lid speculum is inserted patient is asked to look down and inwards throughout the procedure to expose the superotemporal quadrant. Using a pair of non-toothed forceps, conjunctiva is lifted up blunt dissection is done through the tenon's capsule using ophthalmic scissors (Westcott Type Conjunctival Scissors).

A single-use sterile polyurethane 22G x 1" (0.9 x 25 mm) cannula (connected to a 2ml syringe with anaesthetic solution) was then inserted and passed posteriorly through the incision. A 1.5- 2ml anaesthetic solution containing 2% lignocaine and 150IU/ml hyaluronidase was injected into the posterior Subtenon's space. Following the injection of anaesthetic fluid, no pressure was applied to the eye. A cotton bud was put under the eyelid on the location of conjunctival cut to prevent subconjunctival haemorrhage.

Procedure for Peribulbar Anaesthesia:

Peribulbar anaesthesia was given with 24*1 mm needle with the globe in primary gaze initial injection is administered at the inferotemporal orbital boundary (medial 2/3rd and lateral 1/3rd), with a 5ml syringe containing anaesthetic combination (3-4ml of 2% lignocaine with hyaluronidase 150IU/ml). Supplementary injection, were given along superonasal orbital boundary (medial 1/3rd and lateral 2/3rd), Followed by digital massage for about 10 minutes. Supplemental injections may be required for persisting ocular movements. Following block grading of analgesia, akinesia, lid movements and complications like chemosis, subconjunctival haemorrhage were noted.

OBSERVATIONS AND RESULTS:**Table 1: Age Distribution By Type**

Age group	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
<=60	26 (34.7%)	33 (42.9%)	5.822, 0.121
61-65	21 (28.0%)	20 (26.0%)	
66-70	17 (22.7%)	21 (27.3%)	
>70	11 (14.7%)	3 (3.9%)	
Total	75 (100%)	75 (100%)	

Table 2: Gender Distribution

Sex	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
Male	35 (46.7%)	42 (54.5%)	0.944, 0.417
Female	40 (53.3%)	35 (45.5%)	
Total	75 (100%)	75 (100%)	

Table 3: Distribution By Eye Operated

Eye operated	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
Left eye	39 (52.0%)	36 (46.8%)	0.418a, 0.627
Right eye	36 (48.0%)	41 (53.2%)	
Total	75 (100%)	75 (100%)	

Table 4: Distribution By Pain Grade

Pain (grade)	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
Grade 0 [No pain]	6 (8.0%)	64 (83.1%)	86.629a, <0.001
Grade 1 [No pain, slight sensation]	46 (61.3%)	10 (13.0%)	
Grade 2 [Slight pain]	22 (29.3%)	3 (3.9%)	
Grade 3 [Moderate pain]	1 (1.3%)	0 (0.0%)	
Total	75 (100%)	75 (100%)	

Table 5: Distribution By Akinesia Grade

Akinesia (grade)	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
Grade 0 [No movement]	20 (26.7%)	2 (2.6%)	97.575, <0.001
Grade 1 [Mild movements]	55 (73.3%)	15 (19.5%)	
Grade 2 [Moderate movements]	0 (0.0%)	54 (70.1%)	
Grade 3 [Severe movements]	0 (0.0%)	6 (7.8%)	
Total	75 (100%)	75 (100%)	

Table 6: Distribution By Lid Movement Grade

Lid movements (grade)	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
Grade 0 [Little or no squeezing]	67 (89.3%)	65 (84.4%)	2.227, 0.328
Grade 1 [Moderate or ill sustained squeezing throughout]	8 (10.7%)	10 (13.0%)	
Grade 2 [Instantaneous and sustained squeezing]	0 (0.0%)	2 (2.6%)	
Total	75 (100%)	75 (100%)	

Table 7: Complications (Subconjunctival Hemorrhage)

Subconjunctival Hemorrhage	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
Grade 0 [No SCH]	69 (92.0%)	15 (19.5%)	

Grade 1 [SCH in one quadrant]	4 (5.3%)	54 (70.1%)	81.406a, <0.001
Grade 2 [SCH in two quadrants]	2 (2.7%)	8 (10.4%)	
Total	75 (100%)	75 (100%)	

Table 8: Complications (Chemosis)

Chemosis	Type		Chi-Square, P-value*
	Peribulbar Block	Posterior Subtenon's Block	
Grade 0 [No Chemosis]	23 (30.7%)	4 (5.2%)	20.233a, <0.001
Grade 1 [Chemosis in one quadrant]	32 (42.7%)	54 (70.1%)	
Grade 2 [Chemosis in two quadrants]	19 (25.3%)	16 (20.8%)	
Grade 3 [Chemosis in three quadrants]	1 (1.3%)	3 (3.9%)	
Total	75 (100%)	75 (100%)	

DISCUSSION:

MSICS presents an appealing low cost high volume alternative Which is being frequently performed under retrobulbar anaesthesia replaced by peribulbar anaesthesia due to its serious complications. Subtenon's anaesthesia as an alternative to peribulbar to prevent needle related complications. In this study we have made an attempt to compare safety and efficacy of posterior subtenon's anaesthesia with peribulbar anaesthesia. Pain assessment and comparison in both groups being our primary objective it was graded from grade 0 (No pain) to grade 4 (intense pain) in our study percentage of participants with grade 0 (no pain) in posterior subtenon's group was 83 % as compared to 8% in peribulbar group and it is statistically significant. A similar results were found in studies conducted by Parker Tasneem³ et al & Abhijit Datta⁴ et al intraoperative pain in subtenon's anesthesia is less when compared to peribulbar anesthesia.

In our study intraoperative eye ball movements is not completely attained in posterior subtenon's group (19.5%) when compare to peribulbar group (73.3%) and our findings where in tally with a similar study conducted by Deepthi P R⁵ et al. Majority of the patients had attained little lid movements during procedure which is comparable in both the groups (89.3%) in peribulbar and (84.4%) in posterior subtenon's group and findings were consistent with study done by H Siddesh Kumar⁶ et al . The incidence of complications like subconjunctival hemorrhage and chemosis was more common in the posterior subtenon group than in the peribulbar group. Our findings were similar to studies conducted by Parkar Tasneem³ et al & H. Siddesh Kumar⁶ et al.

CONCLUSION:

The current study examined intraoperative discomfort, akinesia, intraoperative lid movements, and problems found during posterior subtenon and peribulbar anaesthesia in manual small incision cataract surgery. Intraoperative pain was significantly lower in the subtenon group, with far fewer participants experiencing unacceptable levels of pain. When compared to posterior subtenon anaesthesia, peribulbar anaesthesia demonstrated a little advantage in terms of intraoperative akinesia. Participants in the posterior subtenon group had slightly higher intraoperative lid movements. Chemosis occurred at nearly the same rate in both groups. Subconjunctival bleeding was more common in the posterior subtenon group than in the peribulbar group. According to our findings of this study, posterior subtenon anaesthesia is just as safe as peribulbar anaesthesia in terms of providing adequate analgesia during surgery.

Conflict Of Interest and Financial Support – NIL**Ethical approval –**

The study was approved and ethical clearance taken from the Ethics committee, Sri Siddhartha Medical College, Tumkur , Karnataka.

REFERENCES

1. Ashok A, Krishnagopal S, Jha KN. Comparison of peribulbar anesthesia with subtenon's in manual small incision cataract surgery. TNOA J Ophthalmic Sci Res 2018;56:67-70
2. Iganga ON, Fasina O, Bekibele CO, Ajayi BG, Ogundipe AO. Comparison of Peribulbar

- with Posterior Sub-Tenon's Anesthesia in Cataract Surgery Among Nigerians. Middle East Afr J Ophthalmol. 2016 Apr-Jun;23(2):195-200. doi: 10.4103/0974-9233.164609. PMID: 27162452; PMCID: PMC4845618.
3. Parkar T, Gogate P, Deshpande M, Adenwala A, Maske A, Verappa K. Comparison of subtenon anaesthesia with peribulbar anaesthesia for manual small incision cataract surgery. Indian J Ophthalmol 2005;53:255-9.
 4. Datta, Abhijit, K. A. Ghosh, Sayan Basu, Kali Shankar Das, and Subhro Ghosal. "Exploring the anaesthetic options for manual small incision cataract surgery (MSICS): A comparative evaluation of peribulbar, sub-tenon's and topical anaesthesia." (2008): 82-83.
 5. Deepthi PR, Amruth CK, Asritha B, Gowtami V. A comparative evaluation of sub-Tenon's anesthesia versus peribulbar anesthesia in manual small-incision cataract surgery. Pan Am J Ophthalmol 2022;4:24.
 6. H. Siddesh Kumar, Kavita Patil. A study of comparison of subtenon's anaesthesia with peribulbar anaesthesia in manual small incision cataract surgery in rims teaching hospital raichur. Int J Intg Med Sci 2019;6(4):807-811