

## Original Research Article

### Effect of subtenon's anaesthesia versus peribulbar anaesthesia in manual small incision cataract surgery cases : A Prospective Comparative Study in a Tertiary Care Teaching Hospital, Telangana, India

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#### ABSTRACT

**Background:** Cataract extraction was commonly carried out using Retrobulbar anaesthesia. Use of this technique is rarely associated with serious complications like retrobulbar hemorrhage, globe perforation, optic nerve injury. Due to these complications many ophthalmologists replaced retrobulbar anaesthesia with peribulbar anaesthesia. However peribulbar anaesthesia does not prevent serious complications totally, although these probably occur less frequently. Even with a two injection technique, it has sometimes an excessive rate of imperfect blockade and pain. Subtenon anaesthesia provides a quicker onset of anaesthesia, better akinesia and more consistency in effectiveness and better patient compliance. **Objectives:** To compare the safety and efficacy of subtenon's anaesthesia and peribulbar anaesthesia in Manual Small Incision Cataract Surgery. **Methodology:** Study was carried out during the period from January 2018 to July 2019. The study was conducted on 100 randomly selected patients fulfilling the criteria. The study was conducted at Medicit Institute Of Medical Sciences, Ghanpur Telangana, India. **Results:** Intra operative pain was dramatically lower in subtenon group of patients with significantly fewer patients experiencing unacceptable levels of pain. Subtenon group of patients had good analgesia

but surgeons had to operate under incomplete akinesia. Peribulbar anaesthesia had an upper hand in terms of intra operative akinesia when compared with subtenon anaesthesia. Intra operative lid movements were slightly more in subtenon group of patients. The incidence of chemosis was almost comparable in both the groups. Subconjunctival haemorrhage was more in subtenon group as compared with patients in peribulbar group. **Conclusion:** From the results it can be concluded that that subtenon form of anaesthesia is as safe as peribulbar anaesthesia, giving good analgesia during surgery.

**Keywords:** Cataract Surgery, Subtenon's anaesthesia, Small incision, MSICS, peribulbar anaesthesia

## INTRODUCTION

In a developing country like India, blindness due to cataract poses a major eye problem, not only in terms of human morbidity but also in terms of socio-economical burden, where our progress is largely dependent on available manpower<sup>1</sup>. Especially in a country like India, the manual small incision cataract surgery offers the great advantages of sutureless cataract surgery<sup>15</sup> as a low cost substitute to phacoemulsification<sup>2,16</sup>. The manual small incision cataract surgery offers an added advantage of having safety, easier learning curve, wider applicability and machine independence<sup>3</sup>. Cataract extraction was commonly carried out using Retrobulbar anaesthesia<sup>14,17</sup>. Use of this technique is rarely associated with serious complications like retrobulbar hemorrhage, globe perforation, optic nerve injury<sup>4</sup>. Due to these complications many ophthalmologists replaced retrobulbar anaesthesia with peribulbar anaesthesia<sup>5</sup>. However peribulbar anaesthesia does not prevent serious complications totally, although these probably occur less frequently. Even with a two injection technique, it has sometimes an excessive rate of imperfect blockade and pain. Subtenon anaesthesia provides a quicker onset of anaesthesia, better akinesia and more consistency in effectiveness and better patient compliance<sup>6</sup>.

Much studies are not available for comparing the efficacy and complications encountered between subtenon anaesthesia and peribulbar anaesthesia in manual small incision cataract surgery. Hence the present work was undertaken to compare the efficacy and complications encountered between subtenon anaesthesia and peribulbar anaesthesia in manual small incision cataract surgery.

## MATERIALS AND METHODS

This study titled "Effect of subtenon's anaesthesia versus peribulbar anaesthesia in manual small incision cataract surgery cases : A Prospective Comparative study in a tertiary care Teaching Hospital, Telangana, India" was carried out during the period from January 2018 to July 2019. The study was conducted on 100 randomly selected patients fulfilling the criteria<sup>7</sup>. The study was conducted at Mediciti Institute Of Medical Sciences, Ghanpur Telangana, India with an aim to compare the Effect of subtenon's anaesthesia versus peribulbar anaesthesia in manual small incision cataract surgery cases.

### Inclusion Criteria

Patients of senile cataract (40 -90 years) under going manual small incision cataract surgery.

### Exclusion Criteria

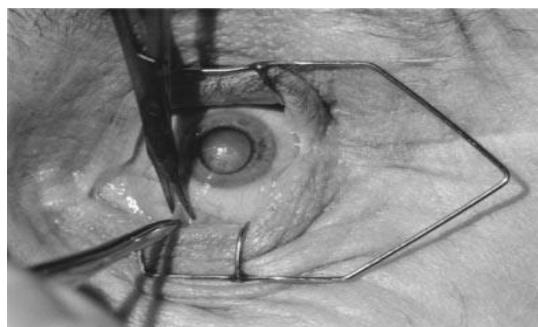
Age < 40 or >90 years, Sensitive to xylocaine, History of convulsions, epilepsy, People who preferred phacoemulsification, Patients of traumatic cataract, Complicated cataract, Congenital cataract, Patients of senile cataract with coexisting glaucoma, Lens induced glaucoma, Pupil <5mm diameter, previous intraocular injury, inflammation or surgery, Inability to understand the visual analogue pain scale<sup>7</sup>

**Ethics:** This study was approved by the Institutional Ethics Committee, Medciti Institute Of Medical Sciences, Ghanpur Telangana, India. An informed written consent was taken from all the patients involved in the study after explaining regarding the study.

**Study Procedure:** 100 patients fulfilling the criteria were randomly selected. Patients were randomly divided into 2 groups. Group 1 (n=50) who underwent manual small incision cataract surgery under subtenon anaesthesia. Group 2 (n=50) patients underwent manual small incision cataract surgery by peribulbar anaesthesia<sup>7</sup>. After the procedure the efficacy and safety of two methods of anaesthesia in Manual small incision cataract surgeries (MSICS) with respect to intraoperative pain, akinesia, lid movements and complications were compared<sup>8</sup>.

### Procedure for Sub Tenon Anaesthesia<sup>7,8,18</sup>:

The injection is made on a supine patient. The conjunctiva is anaesthetized with topical anaesthetic solution (4% xylocaine). An eye lid speculum is inserted at this point to improve access. Throughout the procedure patient is asked to look up and outwards to expose the inferonasal quadrant. A small tent of conjunctiva is raised with a pair of non-toothed forceps approximately midway between the limbus of the eye and the visible angle of the inferonasal portion of the conjunctiva. A small incision is made in the tented conjunctiva with a pair of ophthalmic scissors. The closed scissors are introduced through the aperture created and a tunnel is fashioned through the bare sclera by blunt dissection through tenon's capsule. A curved blunt irrigating cannula (19 G, 25 mm) is then inserted with the syringe of anaesthetic solution (2ml of 2% xylocaine with adrenaline mixed with 1 ml of 0.5% bupivacaine) attached. The cannula is introduced along the contour of the globe and gentle contact of its tip is maintained with the sclera. Occasionally resistance to the needle is felt around the equator where a fibrous band can form as the ocular muscles breach the capsule. This is usually easily overcome by gentle pressure. The cannula was then reintroduced and guided along a path following the contour of the globe until the tip was past the posterior of the equator of the globe. Slow delivery of 3 ml of local anaesthetic was then performed.



**Fig:No:1 Incision of conjunctiva and formation of tent**

Fig No:2 Dissection of Tenon's Capsule

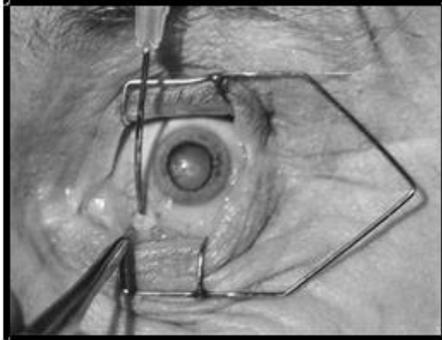
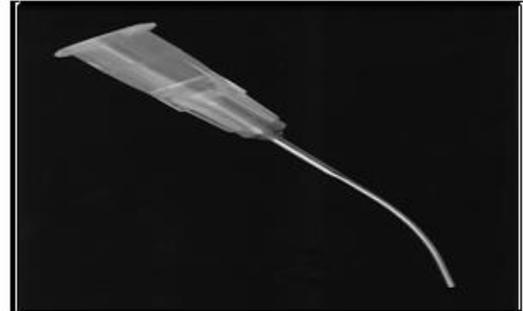


Fig No:3 Visitec Curved Sub tenon's Cannula



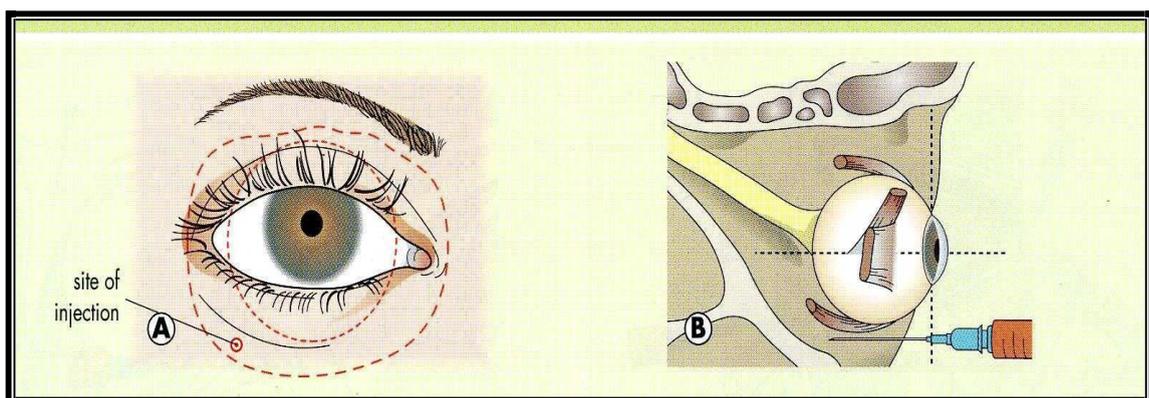
### Procedure for Peribulbar Anaesthesia<sup>7,8,19,20</sup>:

Peribulbar anaesthesia is given by different methods:

#### 1) Inferotemporal Injection

The injection is made on a supine patient. With the globe in primary gaze initial injection is given at the inferotemporal orbital margin midway between the lateral canthus and the lateral limbus. The 25 G, 25 mm needle attached to a syringe containing anaesthetic mixture (3ml of 2% xylocaine with adrenaline and 2 ml of 0.5% bupivacaine) is then advanced parallel to the orbital floor and injected at a depth of about 2.5 cm from the inferior orbital rim. This area contains the neurovascular bundle to the inferior oblique and the belly of the inferior rectus which are potentially at risk for needle perforation. After 3 minutes, the amount of akinesia is assessed.

#### Figure :4 Inferotemporal Injection in Peribulbar Anaesthesia<sup>9</sup>

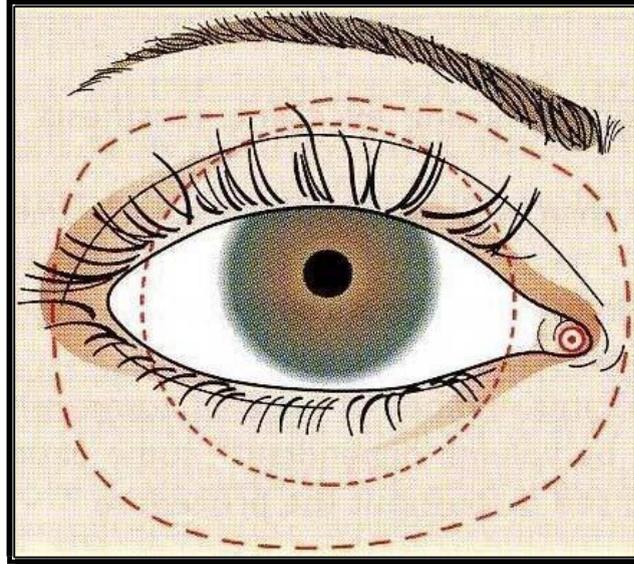


#### 2) Medial Canthal Injection<sup>10</sup>

A 25 or 27 G, sharp needle is inserted in the pit between caruncle and medial canthal angle. Needle should be 45 degrees to the sagittal plane aiming for medial orbital wall, displacing

caruncle medially away from globe. Extreme caution should be applied as the medial wall in this area is very thin (lamina papyracea) and easily to be perforated. In practice it is used as a supplementary block if the inferotemporal injection fails to produce a satisfactory anaesthesia and recommended volume of anaesthetic solution is 3-5 ml

**Figure:5 Medial injection in peribulbar anaesthesia**



#### **4) Superonasal Injection<sup>11</sup>.**

The superior nasal quadrant is less safe to pass the needle (25 G, 25 mm). Its use should be discouraged. The needle can be introduced through the upper eyelid at about 2 mm below and medial to the supraorbital notch or lateral and inferior to the supraorbital notch. It is advanced in a sagittal plane under the roof of the orbit 3-5 ml of anesthetic solution is injected. The needle hub should just touch the skin; if the skin is indented this can increase the incidence of injury of the important structures located deeply in this orbital quadrant (optic nerve). The use of a (25 G, 15mm) needle is also recommended.. This should be used only as a supplementary block in order to achieve full akinesia if it is required by the surgeon.

#### **Ocular Compression**

After local anesthetic injection, the eye is closed by adhesive tape and covered with gauze. Honan's ball (an ocular compression device) is applied for 10-20 min. In addition to softening the globe, compression also helps to spread the anesthetic solution posteriorly, decrease conjunctival oedema and promote akinesia. In conditions when impairment of blood flow to the retina and optic nerve can take place such as in glaucoma and retinal surgery, it has been recommended to maintain ocular perfusion and refrain from using continuous compression. If it is necessary, intermittent digital pressure is applied

### Grading of Intra-Operative Pain

**Table 1-**Grading of intraoperative pain

Grade 0	No pain.
Grade 1	No pain, slight sensation
Grade 2	Slight pain
Grade 3	Moderate pain
Grade 4	Intense pain

### Grading of Akinesia During Surgery.

Akinesia was scored on a scale designed to measure ocular movements in each quadrant.

**Table 2-** Grading of intra operative akinesia

Grade 0	No movement of eyeball
Grade 1	Flutter
Grade 2	Partial movement of eyeball
Grade 3	Full movements of eyeball

According to movements in each quadrant it was graded from Grade 0 to Grade 12

### Grading of Lid Movements During Surgery

**Table -3** Grading of lid movements

Grade 0	Little or no lid squeezing.
Grade 1	Moderate or ill sustained squeezing
Grade 2	Instantaneous and sustained squeezing

### Grading of Chemosis

**Table 4-** Grading of Chemosis

Grade 0	No chemosis
Grade 1	Chemosis in one quadrant
Grade 2	Chemosis in two quadrants
Grade 3	Chemosis in three quadrants
Grade 4	Chemosis in four quadrants.

**Grading of Sub Conjunctival Haemorrhage****Table 5-** Grading of SCH

Grade 0	No SCH
Grade 1	SCH in one quadrant
Grade 2	SCH in two quadrants
Grade 3	SCH in three quadrants
Grade 4	SCH in four quadrants.

**RESULTS**

In this study we compare the efficacy of subtenon's anaesthesia and peribulbar anaesthesia with respect to intra operative pain, akinesia, lid movements and complications like sub conjunctival haemorrhage and chemosis in manual small incision cataract surgery.

**Age distribution :** 100 patients were included in the study, 50 cases were randomly allocated to each of the two groups.

**Table 6 - Age Distribution**

AGE GROUP	SUBTENON GROUP		PERIBULBAR GROUP	
	MALE	FEMALE	MALE	FEMALE
51-60	9	7	4	6
61-70	11	20	19	14
71-80	3	---	4	3
TOTAL	23	27	27	23

The table above shows that in our study in subtenon group there were a total of 23 male patients. Out of these 23 patients 9 were aged between 51 and 60 and 11 between 61 and 70 and 3 between 71 and 80. In the same group total number of females were 27 .7 were between age group 51 and 60, 20 were between age group 61 and 70 and there were no patients between age group 71 and 80. In the peribulbar group the total number of female patients were 23 out of which 6 were in the age group between 51 and 60, 14 in the age group 61-70 and 3 in the age group 71-80. In the same group 27 males were there. 4 were between the age group 51 and 60, 19 patients between 61 and 70. There were 4 patients between the age group 71-80.

**Table 7 - Gender Distribution**

GENDER	SUBTENON GROUP		PERIBULBAR GROUP	
	No	%	No	%
MALES	23	46	27	54
FEMALES	27	54	23	46
TOTAL	50	100	50	100

The table above show that in our study the subtenon group had 46% males and 54% females. The peribulbar group had 54% males and 46% females. The sex ratio in subtenon group is 1.17:1 females to males. In peribulbar group it is 1.17:1 female to male ratio.

**Table 8 – Laterality**

EYE OPERATED	SUBTENON GROUP		PERIBULBAR GROUP	
	No	%	No	%
RIGHT EYE	16	32	25	50
LEFT EYE	34	68	35	50
TOTAL	50	100	50	100

In the subtenon group 16 eyes operated were right eyes(32%) and 34 (68%) were left. In peribulbar group 25(50%) right eyes were operated and 25(50%) left eyes.

### Grade of pain

The status of pain (as per grading system) in the 100 subjects during the intra-operative period is given below.

**Table 9 - Comparison of Intra Operative Pain**

GRADING OF PAIN	SUBTENON GROUP		PERIBULBAR GROUP	
	No	%	No	%
GRADE 0	28	56	15	30

GRADE 1	15	30	22	44
GRADE 2	6	12	8	16
GRADE 3	1	2	3	6
GRADE 4	0	0	2	4
TOTAL	50	100	50	100

The percentage of patients with grade 0 pain in subtenongroup was 56 % as compared to 30% in peribulbar group. Those who had grade 1 pain in subtenon group were 30% and 44% in peribulbar group. Those who had grade 2 pain was 6% in subtenon group and 16% in peribulbar group. Those who had grade 3 pain was 2% in subtenon group and 6% in peribulbar group. None of the patients experienced grade 4 pain in subtenon group but 4% of peribulbar group patients experienced grade 4 pain. 56 % of subtenon patients had no pain and it is statistically significant (chi square value = 6.89, p value=0.009) as compared to 30% of patients in peribulbar group.

#### **Grade of akinesia:**

The status of akinesia (as per grading system) in the 100subjects during the intra- operative period is given below

**Table 10 - Comparison of Intra Operative Akinesia**

GRADING OF AKINESIA	SUBTENONGROUP		PERIBULBARGROUP	
	No	%	No	%
GRADE 0	2	4	27	54
GRADE 2	1	2	10	20
GRADE 4	2	4	10	20
GRADE 6	4	8	2	4
GRADE 8	21	42	1	2
GRADE 10	20	40	0	0
GRADE 12	0	0	0	0
TOTAL	50	100	50	100

The percentage of patients with grade 0 akinesia in subtenon group was 4 % as compared to 54% in peribulbar group. Those who had grade 2 akinesia in subtenon group was 2% and 20% in peribulbar group. Grade 4 akinesia was 4% in subtenon group and 20% in peribulbar group. Those who had grade 6 akinesia was 8% in subtenon group and 4% in peribulbar group. Percentage of patients with grade 8 akinesia were 42% in subtenon group and 2% in peribulbar group. 40 % of subtenon group experienced grade 10 akinesia and none of the patients in peribulbar group experienced grade 10 akinesia. None of the patients in both the groups experienced grade 12 akinesia. 54 % of peribulbar patients had grade 0 akinesia and it is statistically significant (chi square value = 30.35, p value <0.001) as compared with 2 % in subtenon group.

**Grade of lid movements.****Table 11 - Comparison of Intra Operative Lid Movements**

GRADE OF LID MOVEMENTS	SUBTENONGROUP		PERIBULBARGROUP	
	No	%	No	%
GRADE 0	24	48	43	86
GRADE 1	17	34	7	14
GRADE 2	9	18	0	0
TOTAL	50	100	50	100

Grade 0 lid movements were experienced by 48% in subtenon group and 86 % in peribulbar group. Those who had grade 1 lid movements were 34% in subtenon group and 14% in peribulbar group. 18% in subtenon group experienced grade 2 lid movements where as none of the patients in peribulbar group experienced grade 2 lid movements. 86% of the peribulbar group of patients had grade 0 akinesia and it is statistically significant (Chi square value = 13.51, p value = 0.00) when compared with 48% in subtenon group.

**Grade of chemosis****Table 12 - Comparison of Intra Operative Chemosis**

GRADE OF CHEMOSIS	SUBTENON		PERIBULBAR	
	GROUP		GROUP	
	No	%	No	%
GRADE 0	37	74	28	56
GRADE 1	10	20	13	26
GRADE 2	2	4	8	16
GRADE 3	1	2	1	2
GRADE 4	0	0	0	0
TOTAL	50	100	50	100

74% of subtenon group had grade 0 chemosis and 56% in peribulbar group had the same. Grade 1 chemosis was experienced by 20% of subtenon group compared with 26% in peribulbar group. Those who had grade 2 chemosis was 4% in subtenon group and 16% in peribulbar group. Grade 3 chemosis was found in 2% of subtenon group and 2% peribulbar group. None of the patients in both groups experienced grade 4 chemosis. 56% of the peribulbar group of patients had

grade 0 chemosis and it is not statistically significant (Chi square value = 3.56, p value = 0.09) when compared with 74% of patients in subtenon group

**Table 13 - Comparison of Intra Operative SCH**

GRADE OFSCH	SUBTENON		PERIBULBAR	
	GROUP		GROUP	
	No	%	No	%
GRADE 0	15	30	36	72
GRADE 1	27	54	8	16
GRADE 2	7	14	5	10
GRADE 3	1	2	1	2
GRADE 4	0	0	0	0
TOTAL	50	100	50	100

Table shows that 30% of subtenon group and 72% of peribulbar group had grade 0 SCH. Grade 1 SCH was experienced by 54% of subtenon group and 16% of peribulbar group. Those who had grade 2 SCH was 14% in subtenon group and 10% in peribulbar group. 2 % of subtenon group patients had grade 3 SCH and 2% of peribulbar group patients experienced grade 3 SCH. None of the patients in both groups experienced grade 4 SCH. 72% of the peribulbar group had grade 0 SCH and it is statistically significant (Chi square value = 17.64, p value = 0.001) when compared with 30% in subtenon group.

## DISCUSSION

In our study of the 100 patients included, 50 cases were randomly allocated to each of the two groups. In subtenon group there were total of 23 male patients(46%). Out of these 23 patients 9 were aged between 51 and 60 and 11 were between 61 and 70 and 3 patients were between 71-80. In the same group the total number of females were 27 (54%). 7 were between the agegroup 51 and 60 and 20 were between age 61 and 70. Inthe peribulbar group the total no of male patients were 27(54%). Out of which 4 were in the age group 51 and 60 and 19 patients were between 61 and 70 and 4 patients in the age group 71-80. In the same group total number of female patients were 23 (46%), out of which 6 were in the age group 51-60 and 14 were in the age group 61-70 and 3 patients were there in the age group between 71-80.

### Comparison of studies of Intra Operative pain

In the subtenon group the total number of right eyes operated were 16 (32%) and left eyes were 34 (68%). In the peribulbar group the total number of right eyes operated were 25 (50%) and the left eyes being 25 (50%).All the patients were assessed in respect with intra operative pain, akinesia, lid movements, chemosis and subconjunctival haemorrhage. In our study in subtenon group 56% of patients experienced grade 0 pain, 30% experienced grade 1 pain, 6% of patients had grade 2 pain and 2% of patients experienced grade 3 pain and none of the patients had grade 4 pain. In peribulbar group 30% of patients had grade 0 pain, 44% had grade 1 pain, 16 % of patients experienced grade 2 pain where as 6% had grade 3 pain. Grade 4 pain was experienced by 4%.

In the study done by Parkar Tasneem et al<sup>7</sup> out of 80 patients in subtenon group 77.4% of patients experienced grade 0 pain, 20% experienced grade 1 pain. Grade 2 and grade 3 pain were experienced by 1.3% of patients. Out of 88 patients in peribulbar group, grade 0 pain was experienced by 35.2%. 53.4% of patients experienced grade 1 pain. Grade 2 pain was experienced by 7.1%. 2.3% of patients had grade 3 pain and 1% of the patients experienced grade 4 pain. In Abhijit Datta et al<sup>12,13</sup> study: out of 40 patients in subtenon group, 44% had grade 0 pain, 39% had grade I pain. 7.5% of patients experienced grade 2 and grade 3 pain. 2% of the patients had grade 4 pain. In peribulbar group out of 40 patients, 42.5% patients experienced grade 0 pain and grade 1 pain. 5% of the patients had grade 2, 3 and 4 pain. Our observations with regard to intra operative pain were consistent with studies done by Parkar Tasneem et al and Abhijit Datta et al<sup>13</sup>.

### **Comparison of studies of Intra Operative Akinesia**

In our study in subtenon group of 50 patients, 4% of the patients experienced grade 0 akinesia. 2% had grade 2 akinesia. 4% had Grade 4 and grade 6 akinesia were experienced by 8% of patients. 42% had grade 8 akinesia. 40% had grade 10 akinesia. None of the patients had grade 12 akinesia. In peribulbar group of 50 patients, 54% of patients had grade 0 akinesia. 20% had grade 2 and grade 4 akinesia. 4% had grade 6 akinesia where as 2% experienced grade 8 akinesia. None of the patients had grade 10 and grade 12 akinesia. In Parkar Tasneem et al<sup>7</sup> study group: out of 80 subtenon patients none of the patients had grade 0 and grade 2 akinesia. 10% had grade 4, 8.7% had grade 6, 37.5% had grade 8, 41.3% had grade 10 and 2.5% patients experienced grade 12 akinesia. In peribulbar group of 88 patients. 64.7% had grade 0 akinesia, 14.8% had grade 2, 17% had grade 4, 2.3% had grade 6 and 1.2% patients experienced grade 8 akinesia. None of the patients had grade 10 and grade 12 akinesia. Our findings with respect to intra operative akinesia were consistent with study done by Parkar tasneem et al<sup>7</sup>.

In our study grade 0 lid movements were experienced by 70% in subtenon group and 86% in peribulbar group. Those who had grade 1 lid movements were 26% in subtenon group and 14% in peribulbar group. 4% in subtenon group experienced grade 2 lid movements where as none of the patients in peribulbar group experienced grade 2 lid movements.

### **Comparison of studies of Intra Operative Chemosis**

In our study group, out of 50 patients in subtenon group, 74% had grade 0 chemosis, 20% had grade 1 and 4% grade 2 chemosis. 2% experienced grade 3 and none of the patients had grade 4 chemosis. In peribulbar group 56% had grade 0, 26% had grade 1, 16% grade 2, 2% had grade 3 and none of the patients experienced grade 4 chemosis. In Parker Tasneem et al<sup>7</sup> study group, out of 80 patients in subtenon group, 63.75% had grade 0 chemosis. 28.75% had grade 1, 7.5% had grade 2 chemosis. None of the patients had grade 3 and grade 4 chemosis. In peribulbar group of 88 patients, 66% had grade 0, 18.18% had grade 1, 14.69% had grade 2, 1.13% of patients experienced grade 3 chemosis and none of the patients had grade 4 chemosis. In Roman<sup>21</sup> SJ et al study group, out of 110 patients in subtenon group, 15% had grade 0 chemosis. 45% had grade 1, 30% had grade 2 chemosis. 10% of the patients had grade 3 and grade 4 and none of the patients experienced grade 4 chemosis.

### **Comparison of studies of Intra Operative SCH**

In our study, out of 50 subtenon patients, 30% had grade 0 SCH, 54% had grade 1, 14% of patients had grade 2 and 2% had grade 3 and grade 4 SCH was experienced by none of the patients. In peribulbar group 72% had grade 0, 16% had grade 1, 10% had grade 2, 2% had grade 3 and none of the patients had grade 4 SCH. In Parkar Tasneem et al<sup>7</sup> study, out of 80 subtenon

patients, 41.25% had grade 0, 47.50% had grade 1, 11.25% had grade 2 SCH. None of the patients had grade 3 and grade 4 SCH. Out of 88 patients in peribulbar group, 61.36% of patients had grade 0, 22.72% had grade 1, 14.72% had grade 2, 1.20% had grade 3 and none of the patients had grade 4 SCH. In Roman SJ et al<sup>21</sup> group, out of 110 patients 43% had grade 0, 38% had grade 1, 15% had grade 2 SCH. 4% of the patients experienced grade 3 and none of the patients had grade 4 SCH. Our observations were in line with the other two studies.

## CONCLUSION

From the results it can be concluded that intra operative pain was dramatically reduced in subtenon group of patients but few patients significantly experiencing unacceptable levels of pain. Peribulbar anaesthesia had an upper hand in terms of intra operative akinesia when compared with subtenon anaesthesia. Intra operative lid movements were slightly more in subtenon group of patients. The incidence of chemosis was almost comparable in both the groups. Subconjunctival haemorrhage was more in subtenon group as compared with patients in peribulbar group.

In this context, where a country like India deals with people of low socioeconomic group, MSICS offers an attractive low cost and high volume alternative. Surgery was started immediately after administration of anaesthesia in subtenon group. The amount of anaesthetic agents used in subtenon anaesthesia is also less. So in a larger hospital or in a community eye care setting it is more economical and less time consuming. From the results of our study, we can conclude that subtenon form of anaesthesia is as safe as peribulbar technique giving good analgesia during surgery.

## REFERENCES

1. Murthy G, Gupta SK, John N, Vashist P. Current status of cataract blindness and Vision 2020: the right to sight initiative in India. *Indian J Ophthalmol.* 2008 Nov-Dec;56(6):489-94. doi: 10.4103/0301-4738.42774. PMID: 18974520; PMCID: PMC2612994.
2. Singh K, Misbah A, Saluja P, Singh AK. Review of manual small-incision cataract surgery. *Indian J Ophthalmol.* 2017 Dec;65(12):1281-1288. doi: 10.4103/ijo.IJO\_863\_17. PMID: 29208807; PMCID: PMC5742955.
3. Gurnani B, Kaur K. Manual Small Incision Cataract Surgery. [Updated 2022 Jun 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK582123>
4. Alhassan MB, Kyari F, Ejere HO. Peribulbar versus retrobulbar anaesthesia for cataract surgery. *Cochrane Database Syst Rev.* 2015 Jul 2;2015(7):CD004083. doi: 10.1002/14651858.CD004083.pub3. PMID: 26133124; PMCID: PMC7175781.
5. Polania Gutierrez JJ, Riveros Perez E. Retrobulbar Block. [Updated 2022 Apr 30]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK557448/>
6. Kumar CM, Eid H, Dodds C. Sub-Tenon's anaesthesia: complications and their prevention. *Eye (Lond).* 2011 Jun;25(6):694-703. doi: 10.1038/eye.2011.69. Epub 2011 Apr 1. PMID: 21455245; PMCID: PMC3178142.

7. 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 Dec;53(4):255-9. doi: 10.4103/0301-4738.18907. PMID: 16333174.
8. Barikh L. Comparing Subtenon's anesthesia with peribulbar technique for cataract surgery. *Indian J Ophthalmol*. 2006 Sep;54(3):210-1; author reply 211. doi: 10.4103/0301-4738.27083. PMID: 16921226.
9. Fahmi A, Bowman R. Administering an eye anaesthetic: principles, techniques, and complications. *Community Eye Health*. 2008 Mar;21(65):14-7. PMID: 18504471; PMCID: PMC2377384.
10. Kannan SG. Should single medial canthus injection be the default option for peribulbar blocks? *Indian J Anaesth*. 2018 Apr;62(4):321-322. doi: 10.4103/ija.IJA\_45\_18. PMID: 29720763; PMCID: PMC5907443.
11. Husted RF, Hamilton RC, Loken RG. Periocular local anesthesia: medial orbital as an alternative to superior nasal injection. *J Cataract Refract Surg*. 1994 Mar;20(2):197-201. doi: 10.1016/s0886-3350(13)80166-6. PMID: 8201575.
12. Pujari, M.R., et al. "A comparative study of analgesia in peribulbar and sub-tenon's anaesthesia in manual small incision cataract surgery." *Journal of Evolution of Medical and Dental Sciences*, vol. 4, no. 100, 14 Dec. 2015, pp. 16525+. *Gale Academic OneFile*, link.gale.com/apps/doc/A471001443/AONE?u=anon~6151dff5&sid=googleScholar&xid=caa0e5a5. Accessed 8 Dec. 2022
13. Datta A, Ghosh KA, Basu S, Das KS, Ghosal S. Exploring the anaesthetic options for Manual Small Incision Cataract Surgery (MSICS): A Comparative evaluation of peribulbar, sub-tenon's and topical anaesthesia. *AIOC 2008 proceedings*; 82.
14. Ropo A, Nikki P, Ruusuvaara P, Kivisaari L. Comparison of retrobulbar and periocular injections of lignocaine by computerised tomography. *Br J Ophthalmol*. 1991 Jul;75(7):417-20. doi: 10.1136/bjo.75.7.417. PMID: 1854695; PMCID: PMC1042409.
15. Gupta SK, Kumar A, Agarwal S. Cataract surgery under topical anesthesia using 2% lignocaine jelly and intracameral lignocaine: is manual small incision cataract surgery comparable to clear corneal phacoemulsification? *Indian J Ophthalmol*. 2010 Nov-Dec;58(6):537-40. doi: 10.4103/0301-4738.71713. PMID: 20952844; PMCID: PMC2993990.
16. Heuermann T, Hartmann C, Anders N. Long term endothelial cell loss after phacoemulsification: peribulbar anaesthesia versus intracameral lidocaine 1%. *Prospective randomized clinical trial. J Cataract Refract Surg* 2001; 27:1643-50.
17. Patel BC, Burns TA, Crandall A, Shomaker ST, Pace NL, van Eerd A, Clinch T. A comparison of topical and retrobulbar anesthesia for cataract surgery. *Ophthalmology*. 1996 Aug;103(8):1196-203. doi: 10.1016/s0161-6420(96)30522-8. PMID: 8764787.
18. Manners TD, Burton RL. Randomised trial of topical versus sub-Tenon's local anaesthesia for small-incision cataract surgery. *Eye (Lond)*. 1996;10 (Pt 3):367-70. doi: 10.1038/eye.1996.75. PMID: 8796164.
19. Hay A, Flynn HW Jr, Hoffman JI, Rivera AH. Needle penetration of the globe during retrobulbar and peribulbar injections. *Ophthalmology*. 1991 Jul;98(7):1017-24. doi: 10.1016/s0161-6420(91)32164-x. PMID: 1891207.
20. Duker JS, Belmont JB, Benson WE, Brooks HL Jr, Brown GC, Federman JL, Fischer DH, Tasman WS. Inadvertent globe perforation during retrobulbar and peribulbar anesthesia. Patient characteristics, surgical management, and visual outcome. *Ophthalmology*. 1991 Apr;98(4):519-

26. doi: 10.1016/s0161-6420(91)32262-0. PMID: 2052307.

21. Roman SJ, Chong Sit DA, Boureau CM, Auclin FX, Ullern MM. Sub-Tenon's anaesthesia: an efficient and safe technique. *Br J Ophthalmol.* 1997 Aug;81(8):673-6. doi: 10.1136/bjo.81.8.673. PMID: 934956; PMCID: PMC1722293