

## Original Research

### **Analysis of efficacy of Peribulbar with Posterior Sub-Tenon's Anesthesia in patients undergoing Cataract Surgery: A comparative study**

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#### **ABSTRACT:**

**Background:** The present study was conducted for analyzing and comparing the efficacy of Peribulbar with Posterior Sub-Tenon's Anesthesia in patients undergoing Cataract Surgery. **Materials & methods:** A total of 40 patients scheduled to undergo cataract surgery and more than 40 years of age were enrolled in the present study. Subjects with history of any known drug allergy were excluded from the present study. All the 40 patients were randomly divided into two study groups with 20 patients in each group as follows: Group 1: Peribulbar block group, and Group 2: Posterior sub-Tenon block. The patients underwent either manual small incision cataract surgery (MICS) or extracapsular cataract extraction with intraocular lens implantation. Pain assessment was done according to visual analogue scale (VAS). On this scale of 0 to 10, 0 indicated no pain while 10 indicated severe unbearable pain. Pain was assessed during administration of anesthesia, during surgery, and 5 minutes after surgery. **Results:** Mean age of the patients of group 1 and group 2 was 48.2 years and 46.1 years respectively. Non-significant results were obtained while comparing the pain among patients of the two study groups at different time intervals. Chemosis was present in 15 percent of the patients of group 1 and in 40 percent of the patients of group 2. Subconjunctival hemorrhage was present in 10 percent of the patients of group 1 and in 35 percent of the patients of group 2. Incidence of complications was significantly higher among patients of group 2. **Conclusion:** In terms of occurrence of complications, better results were seen among patients of Posterior sub-Tenon block group in comparison to the patients of the Peribulbar block group.

**Key words:** Sub-Tendon's anesthesia, Peribulbar, Cataract

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#### **INTRODUCTION**

Cataract surgery is possibly the world's oldest surgical procedure, introduced to Europe from India by the armies of Alexander the Great. It is now the most frequently performed surgical procedure in the Western world. Few operations have changed so much in recent years. Although phacoemulsification (ultrasonic cataract removal) was introduced more than 30 years ago in the United States, improvements in instruments and surgical technique have now made it the procedure of choice for all routine cataract surgery. Over 85% of all cataract surgery in the United States and the United Kingdom is performed using phacoemulsification.<sup>1,2</sup>

Quality of vision and early rehabilitation are two of the clinical parameters that determine the success of cataract surgery. Advances in surgical techniques,

instrumentation, and pharmacologic agents have contributed to a revolution in this field, making cataract surgery almost risk free. The most exciting innovation in cataract surgery in the 20th century is the technique of phacoemulsification, introduced by Kelman in 1967.<sup>3-5</sup>

Potential factors associated with the reduced rates of severe complications in more recent cohorts include innovations in phacoemulsification technology, the types of instruments available to better manage complex cases (pupil stretchers, capsular tension rings, dyes to stain the capsule), increased use of topical anesthesia, improvements in intraocular lenses, changes in preoperative or postoperative medication regimens, and better strategies to deal with intraoperative complications.<sup>6-8</sup> Hence; the present study was conducted for analyzing and comparing the

efficacy of Peribulbar with Posterior Sub-Tenon's Anesthesia in patients undergoing Cataract Surgery.

**MATERIALS & METHODS**

The current research was conducted in department of ophthalmology and department of anesthesia with the aim of comparing the efficacy of Peribulbar with Posterior Sub-Tenon's Anesthesia in patients undergoing Cataract Surgery. A total of 40 patients scheduled to undergo cataract surgery and more than 40 years of age were enrolled in the present study. Subjects with history of any known drug allergy were excluded from the present study. All the 40 patients were randomly divided into two study groups with 20 patients in each group as follows:

Group 1: Peribulbar block group, and

Group 2: Posterior sub-Tenon block

The patients underwent either manual small incision cataract surgery (MICS) or extracapsular cataract extraction with intraocular lens implantation. All the patients underwent anesthesia according to their respective study groups. Appropriate supplemental anesthetic injection was given through the medial canthal route to any participant in either group where needed. Pain assessment was done according to visual analogue scale (VAS). On this scale of 0 to 10, 0 indicated no pain while 10 indicated severe unbearable pain. Pain was assessment during

administration of anesthesia, during surgery, and 5 minutes after surgery. Grading of pain was done as mild (VAS- 1 to 3), moderate (VAS- 4 to 7) and severe (VAS- 8 to 10). All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS Software. Chi-square test and student t test was used for evaluation of level of significance.

**RESULTS**

Mean age of the patients of group 1 and group 2 was 48.2 years and 46.1 years respectively. Majority proportion of patients of both the study groups were males. Mean VAS among patients of group 1 and group 2 during injection of anesthesia was 2.3 and 2.1 respectively. Mean VAS among patients of group 1 and group 2 during surgery was 2.1 and 2.8 respectively. Mean VAS among patients of group 1 and group 2 during after surgery was 1.3 and 1.5 respectively. Non-significant results were obtained while comparing the pain among patients of the two study groups at different time intervals. Chemosis was present in 15 percent of the patients of group 1 and in 40 percent of the patients of group 2. Subconjunctival hemorrhage was present in 10 percent of the patients of group 1 and in 35 percent of the patients of group 2. Incidence of complications was significantly higher among patients of group 2.

**Table 1: Comparison of pain during injection of anesthesia**

Pain as per VAS	Group 1	Group 2
Mean	2.3	2.1
SD	1.2	1.3
p-value	0.25	

**Table 2: Comparison of pain during surgery**

Pain as per VAS	Group 1	Group 2
Mean	2.1	2.8
SD	1.1	1.4
p-value	0.12	

**Table 3: Comparison of pain after surgery**

Pain as per VAS	Group 1	Group 2
Mean	1.3	1.5
SD	0.8	0.9
p-value	0.84	

**Table 4: Complications**

Complications	Group 1		Group 2		p-value
	Number	Percentage	Number	Percentage	
Chemosis	3	15	8	40	0.002*
Subconjunctival hemorrhage	2	10	7	35	0.000*

\*: Significant

**DISCUSSION**

Lens opacities in the eye are inevitable in later life. A cataract is a symptomatic lens opacity that obstructs the passage of light and causes a reduction of vision (originally translated from Greek “downrush” or Latin

“waterfall”). Fortunately; cataract surgery has undergone a revolution over the last 20 years so that a previously feared in-patient stay is now a relatively pleasant day-case procedure. Visual rehabilitation is usually fast and the majority of patients are delighted

with the result.<sup>8-10</sup> Cataracts are an eye condition that involves the opacification of the natural lens of the eye. Globally, cataracts are the single most important cause of blindness with almost 18 million people estimated to be bilaterally blind from cataract; representing almost half of all causes of blindness due to eye diseases worldwide. Patients with a cataract may experience a range of visual deficits such as deterioration in visual acuity, loss of contrast sensitivity, problems under glare conditions, and altered color recognition. These visual deficits lead to a range of real-world difficulties. Cataract surgery has been shown to be one of the most cost-effective health-care interventions. Most age-related cataracts cannot be prevented but cataract surgery is highly effective, resulting in almost immediate visual rehabilitation.<sup>10-12</sup> Hence; the present study was conducted for analyzing and comparing the efficacy of Peribulbar with Posterior Sub-Tenon's Anesthesia in patients undergoing Cataract Surgery.

Mean age of the patients of group 1 and group 2 was 48.2 years and 46.1 years respectively. Majority proportion of patients of both the study groups were males. Mean VAS among patients of group 1 and group 2 during injection of anesthesia was 2.3 and 2.1 respectively. Mean VAS among patients of group 1 and group 2 during surgery was 2.1 and 2.8 respectively. Mean VAS among patients of group 1 and group 2 during after surgery was 1.3 and 1.5 respectively. Non-significant results were obtained while comparing the pain among patients of the two study groups at different time intervals. Our results were in concordance with the results obtained by previous authors who also reported similar findings. In a study conducted by Iganga ONet al, authors compared the akinetic and the analgesic effects of peribulbar and posterior sub-Tenon's anesthesia in patients undergoing cataract surgery. A total of 152 eyes of 152 patients were studied. Peribulbar and sub-Tenon regional blocks provided comparable adequate akinesia and similar levels of analgesia during cataract surgery. Both techniques also provided similar levels of analgesia to the patient during injection and in the immediate postoperative period. Ninety-two percent of patients who had peribulbar and 97% of those who had sub-Tenon blocks reported either mild pain or no pain at all during surgery. There was no report of severe pain in all patients during the stages of the surgery. Occurrence of chemosis and subconjunctival hemorrhage was more common in sub-Tenon than peribulbar anesthesia. Their study showed that peribulbar and posterior sub-Tenon routes of administering anesthetic substances is comparable in providing adequate akinesia and analgesia for cataract surgery with minimal complications.<sup>13</sup> Tokuda Y et al, authors compared the analgesic effects of sub-Tenon's and retrobulbar anesthesia by assessing patients' response to the visceral stimulus. Pain scores were significantly different among the three anesthesia groups. The multiple comparison revealed that

analgesic effects were highest with sub-Tenon's anesthesia, followed by 5-ml retrobulbar and 3-ml retrobulbar anesthesia. Sub-Tenon's anesthesia is an effective and reliable anesthetic method in cataract surgery.<sup>14</sup>

Chemosis was present in 15 percent of the patients of group 1 and in 40 percent of the patients of group 2. Subconjunctival hemorrhage was present in 10 percent of the patients of group 1 and in 35 percent of the patients of group 2. Incidence of complications was significantly higher among patients of group 2. Azmon B et al, in another study, compared the effectiveness of sub-Tenon's versus peribulbar anesthesia in extracapsular cataract surgery. Sixty-four consecutive patients who had extracapsular cataract surgery were randomized to have sub-Tenon's or peribulbar anesthesia. One minute after the injection, IOP increased significantly in the peribulbar group. There was no significant increase in the sub-Tenon's injection group. In both groups, IOP returned to preinjection levels by 10 minutes postoperatively. Patients with peribulbar anesthesia reported a significantly higher level of anxiety than those who had sub-Tenon's anesthesia. Although the intraoperative pain levels were the same, the sub-Tenon's group reported significantly higher levels of pain 1 and 24 hours postoperatively; 16% in the sub-Tenon's group and none in the peribulbar group reported moderate pain 24 hours after anesthesia. Ocular motility was the same except for the inferior rectus muscle, which was less motile on average in the peribulbar group. Sub-Tenon's anesthesia led to less IOP elevation than peribulbar anesthesia and provided similarly good globe immobilization and approximately the same pain levels intraoperatively.<sup>15</sup>

## CONCLUSION

In terms of occurrence of complications, better results were seen among patients of Posterior sub-Tenon block group in comparison to the patients of the Peribulbar block group.

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