

## Original Research

### Single site versus double site injection of peribulbar anaesthesia for cataract surgery

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#### ABSTRACT:

**Background:** The most common surgical procedure in ophthalmology clinical practice is cataract surgery, which is typically carried out under regional anesthesia. The present study was conducted to compare single site versus double site injection of peribulbar anaesthesia for cataract surgery. **Materials & Methods:** 56 patients of cataract of both genders were divided into 2 groups of 28 each. Group I patients received single site injection peribulbar anaesthesia and group II received double site injection peribulbar anaesthesia. Peribulbar anaesthesia was given in both the group before surgery and effect of anaesthesia were analysed in terms of analgesia, akinesia and complications. **Results:** Out of 56 patients, 30 were males and 26 were females. In group I and group II, grading of analgesia was grade 0 in 12 and 14, grade 1 in 9 and 10, grade 2 in 4 and 3, grade 3 in 3 and 1 respectively. Grading of akinesia was grade 0 in 2 and 3, grade 1 in 2 and 4, grade 2 in 4 and 3 and grade 3 in 20 and 18 patients. Complications were sub-conjunctival haemorrhage in 2 and 3, chemosis in 1 and 2 and ecchymosis in 4 and 9 patients respectively. The difference was significant ( $P < 0.05$ ). **Conclusion:** During cataract surgery, both single site and double site injection techniques for peribulbar anaesthesia offer sufficient analgesia, akinesia, and anaesthesia.

**Keywords:** akinesia, cataract surgery, peribulbar anaesthesia,

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#### INTRODUCTION

The most common surgical procedure in ophthalmology clinical practice is cataract surgery, which is typically carried out under regional anesthesia via a variety of administration routes, including topical anesthesia, deep forniceal anesthesia for phacoemulsification, subtenon injection, facial block with retrobulbar anesthesia, and peribulbar anesthesia.<sup>1</sup>

For over a century, the majority of ophthalmologists used retrobulbar anesthesia, which was frequently linked to problems such as brain stem anesthesia, optic nerve injury, globe perforation, and retrobulbar hemorrhage (RBH).<sup>2</sup> Retrobulbar anesthesia was used with facial blocks to achieve sufficient paralysis of the orbicularis oculi muscle. Many patients complained of pain during the injection and often for days following while moving their jaw, and cases of facial palsy lasting three months or longer were observed after

facial blocks.<sup>3</sup>

In several instances, the O'Briens technique's face block proved ineffective due to anatomical variations in the facial nerve's route.<sup>4</sup>

Because it is comparatively successful at producing ocular akinesia and anesthesia with a lower risk of consequences such as optic nerve injury and globe perforation, peribulbar anesthesia has grown in favor in recent years.<sup>5</sup> The anesthetic agent can be administered at two distinct sites (double injection technique) or at a single site (single injection approach) in order to provide peribulbar anesthesia, as might Husted's method.<sup>6</sup> However, in a small number of cases, the double injection technique of peribulbar anesthesia resulted in complications such as subconjunctival hemorrhage (SCH), conjunctival chemosis, and damage to intraorbital structures. The superior site is a potential space that could result in complications like globe perforation.<sup>7</sup> The present

study was conducted to compare single site versus double site injection of peribulbar anaesthesia for cataract surgery.

**MATERIALS & METHODS**

The study was carried out on 56 patients of cataract 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 28 each. Group

I patients received single site injection peribulbar anaesthesia and group II received double site injection peribulbar anaesthesia. Peribulbar anaesthesia was given in both the group before surgery and effect of anaesthesia were analysed in terms of analgesia, akinesia and complications. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Total- 56		
Gender	Male	Female
Number	30	26

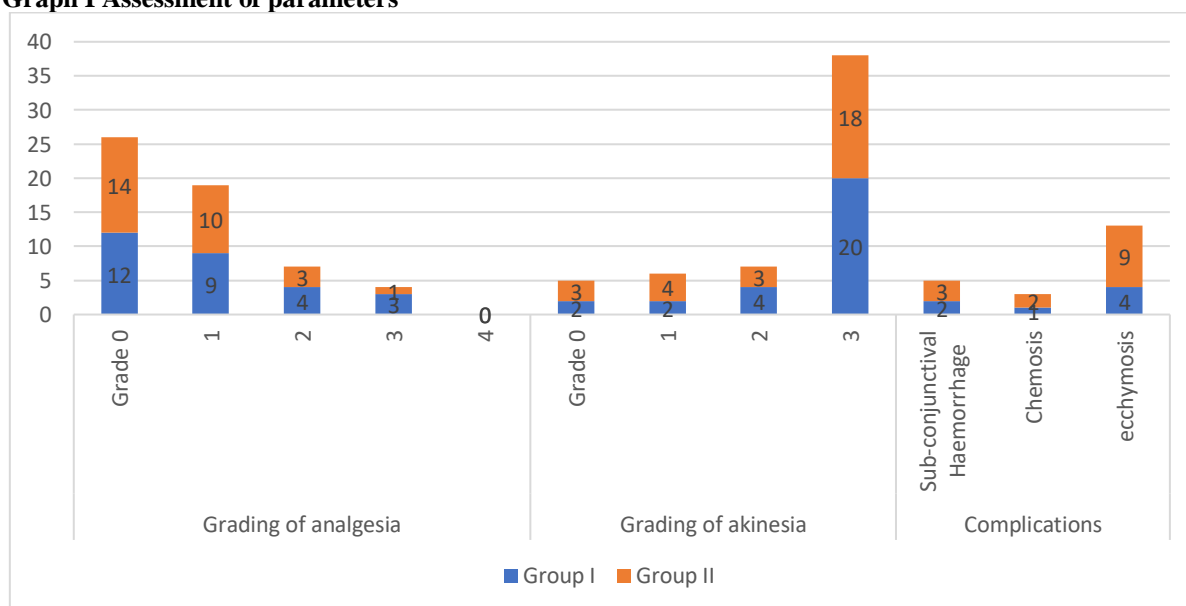
Table I shows that out of 56 patients, 30 were males and 26 were females.

**Table II Assessment of parameters**

Parameters	Variables	Group I	Group II	P value
Grading of analgesia	Grade 0	12	14	0.75
	1	9	10	
	2	4	3	
	3	3	1	
	4	0	0	
Grading of akinesia	Grade 0	2	3	0.05
	1	2	4	
	2	4	3	
	3	20	18	
Complications	Sub-conjunctival Haemorrhage	2	3	0.05
	Chemosis	1	2	
	ecchymosis	4	9	

Table II, graph I shows that in group I and group II, grading of analgesia was grade 0 in 12 and 14, grade 1 in 9 and 10, grade 2 in 4 and 3, grade 3 in 3 and 1 respectively. Grading of akinesia was grade 0 in 2 and 3, grade 1 in 2 and 4, grade 2 in 4 and 3 and grade 3 in 20 and 18 patients. Complications were sub-conjunctival haemorrhage in 2 and 3, chemosis in 1 and 2 and ecchymosis in 4 and 9 patients respectively. The difference was significant (P< 0.05).

**Graph I Assessment of parameters**



## DISCUSSION

Akinesia and analgesia during intra-ocular surgery are prerequisites for good anaesthesia. It provides comfortable environment for the patient and surgeon during surgery and also helps in quick recovery of functions without added risks.<sup>8</sup> Many techniques from era of retro-bulbar anaesthesia to more recent topical anaesthesia have been tried to achieve this goal. Sub-Tenon's anaesthesia (STA) and peri-bulbar anaesthesia (PBA) are two often employed methods for ophthalmic procedures.<sup>9</sup> A possibly safer alternative was peribulbar anaesthesia. It does, however, require a bigger amount of anesthetic drug, a faster rate of replenishment, and a slower onset of akinesia.<sup>10</sup> Following standard peribulbar injections, serious side effects such retrobulbar hemorrhage, globe perforation, and brainstem injection have also been documented. Needlestick-free techniques like sub-Tenon and topical, as well as topical with intracameral anaesthesia, were created to prevent these issues.<sup>11</sup> The present study was conducted to compare single site versus double site injection of peribulbar anaesthesia for cataract surgery.

We found that out of 56 patients, 30 were males and 26 were females. Parker et al<sup>12</sup> compared the safety and efficacy of subtenon anaesthesia with peribulbar anaesthesia in manual small incision cataract surgery. One hundred and sixty-eight patients were randomised to subtenon and peribulbar groups. About 146/168 (86.9%) patients completed the six-week follow-up. Thirty-one out of 88 (35.2%) patients of peribulbar group and 62/80 (77.5%) of subtenon group experienced no pain during administration of anaesthesia. There was no significant difference in pain during and 4 h after surgery. Subtenon group had slightly more sub-conjunctival haemorrhage. About 57 (64.8%) patients of the peribulbar group had absolute akinesia during surgery as compared to none (0%) in sub-tenon group. There was no difference in intraoperative and postoperative complications and final visual acuity.

We found that in group I and group II, grading of analgesia was grade 0 in 12 and 14, grade 1 in 9 and 10, grade 2 in 4 and 3, grade 3 in 3 and 1 respectively. Grading of akinesia was grade 0 in 2 and 3, grade 1 in 2 and 4, grade 2 in 4 and 3 and grade 3 in 20 and 18 patients. Complications were sub-conjunctival haemorrhage in 2 and 3, chemosis in 1 and 2 and ecchymosis in 4 and 9 patients respectively. Rizzo L et al<sup>13</sup> evaluated the efficacy and safety of a single injection technique with a small volume of anesthetic for ocular peribulbar anaesthesia. They included 857 patients undergoing various ophthalmic procedures. Anaesthesia consisted of a medial percutaneous injection of 5-6.5 mL of 2% lidocaine. At 2 min 85.6% of the patients had a motor block of at least 50% and at 5 min 78.6% had a motor block >80%. After 5 min 100% of the patients had adequate surgical anaesthesia. There were no serious block-related complications.

Singh P et al<sup>14</sup> in their study two groups of 50 patients each were given either PBA or STA at random. Supplementary injections were given after 10 minutes if adequate akinesia did not occur. Complete akinesia occurred in 86% in PBA group compared to 68% that in the STA group  $p=0.033$  (OR=2.8, CI95% (1.42-5.84). Number of supplementary injections were 24% in STA group and 6% in PBA group ( $p=0.001$ ) (OR=0.238, 95% CI (0.09-0.58). Seventy eight percent of PBA group and 62% of STA group experienced no pain during the operation ( $p=0.014$ ) (OR=2.17, 95% CI (1.16-4.04). Subconjunctival hemorrhage in the PBA group (32%), which involved only one quadrant of ocular surface as compared to the STA group (50%) ( $p=0.01$ ) (OR= 0.47, 95% CI (0.26- 0.83). Chemosis in one quadrant was less in PBA group (18%) as compared to (32%) STA group ( $p=0.023$ ) (OR=0.46, 95% CI (0.24-0.9). There was no incidence of retro bulbar hemorrhage or eye perforation in both groups. Sixty percent patients in STA group were satisfied or highly satisfied (Likert score 6-7) compared to 42% in PBA group ( $P=0.01$ ). Sub-Tenon anaesthesia during manual small incision cataract surgery provided moderate akinesia and good analgesia. Satisfaction was high among sub-Tenon group patients. Sub-Tenon anaesthesia can be a safe and effective alternative to peribulbar anaesthesia in manual small incision cataract surgery. The shortcoming of the study is small sample size.

## CONCLUSION

Authors found that during cataract surgery, both single site and double site injection techniques for peribulbar anaesthesia offer sufficient analgesia, akinesia, and anaesthesia.

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