



## Original Research Article

## Comparison of outcome between single site versus double site injection of peribulbar anaesthesia for cataract surgery

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## ABSTRACT

**Purpose:** To compare the efficacy and safety of single injection technique of Peribulbar anaesthesia with that of double site injection technique for cataract extraction in terms akinesia, analgesia, onset and duration of the action of analgesia and incidence of complications.

**Materials and Methods:** A cross-sectional study involving 342 eyes which were randomised into two groups of 171 group A (single site injection peribulbar anaesthesia) and group B (double site injection peribulbar anaesthesia) by simple randomization. All the patients underwent similar protocol for standard cataract evaluation. Peribulbar anaesthesia was given in both the group before surgery and effect of anaesthesia were analysed in terms of analgesia and akinesia.

**Results:** Analgesia ( $P = 0.074$ ) and akinesia ( $P = 0.054$ ) were good in both the group but the results were not statistically significant between the 2 groups. At the end of 15 minutes all the patients attained akinesia and analgesia in both the ( $P = 0.053$ ). Complications were more in group B than in group A.

**Conclusion:** Single site injection of peribulbar anaesthesia is less painful during administration compared to double site peribulbar anaesthesia. Complications are more in double site injection comparatively.

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### 1. Introduction

Cataract surgery is the most common operative procedure in ophthalmology clinical practice which is usually performed under regional anaesthesia by various routes of administration such as facial block with retrobulbar anaesthesia, peribulbar anaesthesia or under subtenon's injection or under topical anaesthesia or deep forniceal anaesthesia for phacoemulsification.

Retrobulbar anaesthesia which most of the ophthalmologists were using for almost a century was often associated with complications like retrobulbar haemorrhage (RBH), globe perforation, optic nerve damage and brain stem anaesthesia.<sup>1</sup>

Facial blocks were used in combination with retrobulbar anaesthesia to obtain adequate paralysis of orbicularis oculi

muscle. Following facial block instances of facial palsy lasting for 3 months or more were noted and many patients complained about the pain at the time of injection and occasionally for many days thereafter on moving the jaw. Due to anatomical variation in the course of facial nerve, the facial block was not effective in few cases by O'Briens technique.<sup>1</sup>

Subtenon's anaesthesia was described in the year 1956 for the first time, gained popularity later since 1990 as it is a safer and effective anaesthetic technique without the complications associated with sharp needle injection like globe perforation, retro orbital haemorrhage and extra ocular muscle paresis.<sup>2</sup>

Topical anaesthesia of conjunctiva and cornea is more useful in phacoemulsification where akinesia is not absolutely needed.

Peribulbar anaesthesia has gained popularity over the last few years as it is relatively effective in inducing

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ocular akinesia and anaesthesia with less possibility of complications like optic nerve injury and globe perforation. Peribulbar anaesthesia can be given by administering the anaesthetic agent at two different sites (Double injection technique) or at single site (single injection technique) and Husted's method. However, some complications like subconjunctival haemorrhage (SCH), conjunctival chemosis and injury to intraorbital structures were observed in few cases in double injection technique of peribulbar anaesthesia with superior site being a potential space which may lead to complications like globe perforation.<sup>3</sup>

The single-injection technique of percutaneous peribulbar anaesthesia using less volume of local anaesthetic agent with a short needle is as effective, simple and easy to perform injection technique with less pain to the patients and provides satisfactory anaesthesia and akinesia. These potential benefits led us to evaluate the efficiency and safety of single site injection technique with double site injection technique of peribulbar anaesthesia for cataract surgeries.<sup>4</sup>

Hence the present study has been done to compare the safety and effectiveness of single site injection versus double site injection technique of peribulbar anaesthesia for cataract surgery.

## 2. Aims and Objectives

To compare the efficacy and safety of single injection technique of Peribulbar anaesthesia with that of double site injection technique for cataract extraction in terms of the following:

1. Akinesia
2. Analgesia
3. Onset and duration of the action of analgesia.
4. Incidence of complications

## 3. Materials and Methods

### 3.1. Source of data

This was a cross sectional study conducted in the department of ophthalmology in R.L.J. Hospital and Research Centre attached to Sri Devaraj Urs Medical College from December 2017 and May 2019.

Approval from institutional ethics committee was taken. Written informed consent was taken from all the patients who underwent cataract surgery.

### 3.2. Sample size

A total of 342 eyes fulfilling the inclusion criteria were selected and randomised into two groups of 171 patients in each group by simple randomization technique. All patients allotted even numbers were kept in group A (Single site peribulbar anaesthesia) and patient allotted odd numbers were kept in group B (Double site peribulbar anaesthesia).

### 3.3. Inclusion criteria

1. Patients undergoing cataract surgery between the age group of 40years – 90 years were included.

### 3.4. Exclusion criteria

1. Allergic to anaesthetic agent.
2. Pre-existing ocular muscle paresis, neurological deficit.
3. Co-existing inflammatory conditions of eye.
4. Hypertensive patients.
5. History of trauma to the eye.
6. Hypermature and pseudoexfoliation cases for cataract patients.
7. Complicated cataracts.
8. Previously operated eyes – posterior segment vitreoretinal surgeries.

### 3.5. Method of collection of data

After obtaining the written informed consent all the patients underwent similar protocol for standard cataract evaluation, which consisted of detailed history and ocular examination including recording of visual acuity, slit lamp examination, fundus evaluation, intraocular pressure, lacrimal syringing and intraocular lens power calculation followed by necessary investigations such as blood sugar levels, HIV, HBsAg, ECG.

The patients who were fit and posted for cataract surgery were randomised in to group A (single site injection peribulbar anaesthesia) and group B (double site injection peribulbar anaesthesia).

All patients were on oral tab Ciprofloxacin 500mg twice daily and Ciprofloxacin 0.3% eye drops 6 times per day before the surgery. For both the groups test dose of the local anaesthetic injection (equal volume of 2% lignocaine and 0.5% bupivacaine) was given for every patient and observed for any adverse reaction.

Preoperatively pupils were dilated with tropicamide 0.8% with phenylephrine 0.5% drops along with flurbiprofen 0.03% drops.

Preparation of local anaesthetic mixture: 2% lignocaine with adrenaline (1: 200000) +hyaluronidase 1500 International units (IU) + 0.5% Bupivacaine 2%.

### 3.6. Technique of peribulbar anaesthesia

1. Patient preparation.
2. Patient position: - Supine.
3. Skin preparation: - 5% povidone iodine solution.

### 3.7. Group A

Patients were explained about the procedure and was asked to look in primary gaze. Using a 5 ml syringe with 24 gauge needle which was 2.5 cm in length was taken.

Injection was given inferior-temporally at the junction of lateral 1/3<sup>rd</sup> and medial 2/3<sup>rd</sup> of lower orbital margin. The needle was advanced parallel to the plane of floor of the orbit till 2.5 cm and 5 ml of anaesthetic agent was injected after cautious aspiration to rule out intra-vascular needle placement. Massage was given to eye ball intermittently.

### 3.8. Group B

Patient were explained about the procedure and was asked to look in primary gaze. Using a syringe with 24 gauge needle which was 2.5 cm in length was taken. Initially the injection was given inferior-temporally at the junction of lateral 1/3<sup>rd</sup> and medial 2/3<sup>rd</sup> of lower orbital margin and 3.5ml of anaesthetic solution was given after cautious aspiration to rule out intra-vascular needle placement.

At supero-nasal margin of orbit second injection was given, needle advanced to about 2.5 cm along roof and 3.5 ml of anaesthetic solution injected after delicate aspiration to rule out intravascular placement. Massage was given to eye ball intermittently.

### 3.9. Parameters studied

1. Analgesia.
2. Akinesia.
3. Onset of action & duration of action (Analgesia).
4. Complications.

## 4. Results

Total number of patients included were 342 of which 171 patients were in group A underwent small incision cataract surgery under single site injection peribulbar anaesthesia and 171 patients were in group B under double site injection peribulbar anaesthesia.

The patient's age in our study in the group A ranged from 40-90 years and in group B from 42-85 years. There was no significant age difference between the two groups calculated by Student T test. (t value = - 0.122. P value = 0.168).

**Table 1:** Mean age distribution of study group

Age In Years	Single Site Injection	Double Site Injection
41-50	09	07
51-60	49	53
61-70	97	96
71-80	15	14
81-90	01	01
MEAN	63.35	63.73

In Group A (Single Injection Site) 171 patients out of which 82(48%) were males, 89(52%) were females. In Group B (Double Injection Site) 171 patients out of which 80(47%) were males, 91(53%) were females. There was no significant sex difference between the two groups calculated

by Student T test. (P value = 0.153).

### 4.1. Analgesia

At the time of administration, in group A 4 had no pain, 71 had mild pain, 72 had moderate pain, 24 had severe pain, very severe pain was not present in any cases. In group B, 2 had no pain, 73 had mild pain, 74 had moderate pain, 20 had severe pain and 2 had very severe pain. Severity of analgesia at the time of administration was not statistically significant. (P= 0.162).

Intra operatively: in group A 98 patients had no pain, 68 had mild pain, 05 had moderate pain, 0- none of them had severe pain, 0- none of the patients were having very severe pain. In group B 95 had no pain, 61 had mild pain, 15 had moderate pain, 0- none had severe pain and 0- none had very severe pain. Severity of analgesia intra operatively was not statistically significant. (P= 0.074).

Post operatively after 4 hours after injection: in group A 48 had no pain, 64 had mild pain, 38 had moderate pain, 18 had severe pain, 3 were having very severe pain. In group B 58 had no pain, 61 had mild pain, 35 had moderate pain, 12 patients had severe pain and 05 had very severe pain. Severity of analgesia post-operatively, 4 hours after injection was not statistically significant. (P= 0.080).

### 4.2. Akinesia

5 minutes after giving injection in group A 14 had complete movements, 52 had moderate movements, 54 had slight movements and 51 patients had no movements. Group B had 12 complete movements 55 had moderate movements, 50 had slight movements and 54 had no movements. Akinesia between 2 groups 5 minutes after giving injection was not statistically significant. (P= 0.073).

15 min after injection: group A 8 had complete movements, 10 had moderate movements, 61 had slight movements and 92 patients had no movements. Group B had 5 complete movements 12 had moderate movements, 59 had slight movements and 95 patients had no movements. Akinesia between 2 groups 15 minutes after giving injection was not statistically significant. (P= 0.061).

30 min after injection: group A 4 had complete movements, 9 had moderate movements, 62 had slight movements and 96 patients had no movements. Group B had 5 complete movements 8 had moderate movements, 65 had slight movements and 93 patients had no movements. Akinesia between 2 groups 30 minutes after giving injection was not statistically significant. (P= 0.054). Repeat 3ml injection of anesthetic agent was given in patients those who did not have akinesia even after 30 minutes.

## 5. Movements

5 minutes after giving injection in group A 26 had complete movements, 41 had reduced movements and 104

**Table 2:** Grading of analgesia

Grades	Severity of pain	At the time of administration		Intraoperative		Post operative (after 4 hrs of surgery)	
		Group A	Group B	Group A	Group B	Group A	Group B
Grade 0	No pain	4	2	98	95	48	58
Grade 1	Mild pain	71	73	68	61	64	61
Grade 2	Moderate pain	72	74	05	15	38	35
Grade 3	Severe pain	24	20	-	-	18	12
Grade 4	Very severe pain	-	2	-	-	03	05

**Table 3:** Grading of akinesia

Grades	Eye ball movements	5 min after injection		15 min after injection		30 min after injection	
		Group A	Group B	Group A	Group B	Group A	Group B
Grade 0	Complete movements	14	12	8	5	4	5
Grade 1	Moderate movements	52	55	10	12	9	8
Grade 2	Slight movements	54	50	61	59	62	65
Grade 3	No movements	51	54	92	95	96	93

patients had no movements. Group B 22 had complete movements, 50 had reduced movements and 99 patients had no movements. Lid akinesia between 2 groups 5 minutes after injection was not statistically significant. ( $P=0.057$ ).

10 minutes after giving injection in group A 8 had complete movements, 54 had reduced movements and 109 patients had no movements. Group B had 12 complete movements, 44 had reduced movements and 115 patients had no movements. Lid akinesia between 2 groups 10 minutes after injection was not statistically significant. ( $P=0.052$ ).

15 minutes after giving injection in group A 6 had complete movements, 30 had reduced movements and 135 patients had no movements. Group B had 8 complete movements, 27 had reduced movements and 136 patients had no movements. Lid akinesia between 2 groups 15 minutes after injection was not statistically significant. ( $P=0.055$ ).

### 5.1. Onset of action of anesthetic agent

Group A: 52 patients took 0-5 minutes for the onset of action, 90 patients took 5-10 min. and 27 took 10-15 min and 2 patients took more than 15 min for the onset of action. GROUP B 54 patients took 0-5 min. for the onset of action, 95 patients took 5-10 min. and 20 took 10-15 min and 0-none patients took more than 15 min for the onset of action. Onset of action was not statistically significant between the 2 groups ( $P=0.053$ ).

### 5.2. Complications

Sub conjunctival haemorrhage: Out of 171 patients in group A 136(79.5%) patients had no SCH, 20(11.6%) patients had SCH in one quadrant, 15(8.7%) patients in two quadrants, 3(1.5%) patients in three or more quadrants.

In group B 117(68.4%) patients had no SCH, 28(16.3%) patients had SCH in one quadrant, and 22(12.8%) patients in two quadrants and 4(2.3%) patients in three or more quadrants.

Sub-Conjunctival Haemorrhage was more in group B than group A, which was not of statistical significance.

Chemosis: Out of 171 patients in group A 124(72.5%) patients had no chemosis, 21(12.2%) patients had chemosis in one quadrant, 16(9.3%) patients in two quadrants, 10(5.8%) in three or more quadrants.

In group B 116(67.8%) patients had no chemosis, 26(15.2%) patients had chemosis in one quadrant, and 21(12.2%) patients in two quadrants. 8(4.6%) patients in three or more quadrants.

Overall chemosis was more in group B than group A, which was not much of statistical significance.

Other complications like ecchymosis was present in 4 cases in group A and 8 patients showed ecchymosis in group B. Group B showed other complications like lid haemorrhage in 2 cases, retro-bulbar haemorrhage in 2 cases, post-operative transient ptosis in 2 cases and 2 cases had globe perforation while giving injection at the superior site.

## 6. Discussion

The age group of the patients in our study ranged from 40-90 years. The mean age in our study was 63.35 years in Group A and was 63.73 years in Group B. Majority of patients were between 61-70 years. 180 (69.04%) females and 162 males (30.9%). In Group A, 52.05% were females and 47.95% were males and in Group B, 53.22% were females and 46.78% were males.

### 6.1. At the time of administration

In our study in group A 14.03% of patients did not experience any pain during administration, while in group B only 11.17% of patients did not experience pain rest all patients experienced mild to severe pain.

### 6.2. Intra operative analgesia

In our study 57.3% patients in group A did not experience any kind of pain intra operatively while in group B 55.55% patients did not experience any kind of pain or sensation. 39.78% patients experienced mild pain in group A and 35.68% patients experienced mild pain group B. Only 2.92% and 8.77% patients experienced moderate pain in group A and group B respectively. There was no statistically significant difference between two groups.

A study by Ghali AM et al demonstrated that higher percentages of patients experienced moderate and severe pain in the double-injection group compared with the single injection group<sup>5</sup>

### 6.3. Post-operative – 4 hours after injection

In our study, 28.1% patients in group A did not feel any pain post-operatively while in group B 33.9% patients did not feel any pain. Rest of the patients felt mild to severe pain.

Both groups of peribulbar anaesthesia comparably provided effective intra operative analgesia while doing cataract surgery.

## 6.4. Akinesia

### 6.4.1. Globe akinesia

In our study at 5 min after injection of anaesthesia, in group A 29.8% had no movements and in group B 31.6% had no movements.

At 15 min after injection of anaesthesia, in group A 53.8% patients did not had movements and in group B 55.5% patients did not had any movements. 35.7% group A and 34.5% group B had mild movements. Rest had moderate to complete movements.

At 30 min after injection of anaesthesia, in group A 56.2% patients did not had any movements and in group B 56.8% patients did not had no movements. Others had mild to moderate movements. 4(2.35%) patients in group A and

5(2.92%) patients in group B had complete movements after 30 min. of injection and needed repeat injection.

Kollaritis et al showed complete akinesia in 82% of patients in peribulbar anaesthesia.<sup>5</sup>

### 6.4.2. Lid akinesia

Our study showed at 5 min after injection of anaesthesia, in group A 60.8% had no movements and in group B 57.9% patients did not had movements.

At 10 minutes after injection of anaesthesia, in group A 63.8% patients did not have movements and in group B 67.2% patients did not had movements.

At 15 minutes after injection of anaesthesia, in group A 78.9% did not have movements and in group B 79.5% patients did not have movements. 3.8% in group A and 4.6% in group B required lid block separately as there was complete movement after 15 min of injection.

Delivery of anaesthetic agent in the posterior orbital space allows direct extension along extra ocular muscles. It also allows diffusion of local anaesthetic agent. This mechanism is supported by various studies.

Steven A Rowley et al in their study reported hyaluronidase has a beneficial effect in improving the quality of motor blockage achieved with subtenon's local anaesthesia.<sup>6</sup>

### 6.5. Onset of action

Group A : 52 patients took 0-5 min. for the onset of action, 90 patients took 5-10 min. and 27 took 10-15 min and 2 patients took more than 15 min for the onset of action. GROUP B 54 patients took 0-5 min. for the onset of action, 95 patients took 5-10 min. and 20 took 10-15 min and 0-none patients took more than 15 min for the onset of action. Onset of action was not statistically significant between the 2 groups (P= 0.053).

### 6.6. Duration of action in terms analgesia

Group A : 10 patients anesthetic action lost for 30-60 min., for 35 patients action lasted for 60-90 min., 110 action lost for 90-120 min. and for 16 patients action lost for more than 120 minutes. Group B : 5 patients anesthetic action lasted for 30-60 min., for 32 patients action lasted for 60-90 min., 115 action lasted for 90-120 min. and for 19 patients action lasted for more than 120 minutes. Duration of action was also not statistically significant between the 2 groups (P= 0.051).

### 6.7. Complications

#### 6.7.1. Chemosis

Chemosis and SCH were frequently observed complications compared to others. In our study in group A 124(72.5%) patients did not have chemosis, 21(12.2%) patients had chemosis in any one quadrant, 16(9.3%) patients had

chemosis in two quadrants, 10(5.8%) patients had chemosis in three or more quadrants. In group B 116(67.8%) patients did not have chemosis, 26(15.2%) patients had chemosis in any one quadrant, and 21(12.2%) patients had chemosis in two quadrants. 8(4.6%) patients had chemosis in three or more quadrants. The chemosis occurred due to anterior tracking of anaesthetic agent into sub-conjunctival space.

Study by Roman SJ et al reported that 39% of patients had chemosis in more than one quadrant in subtenon's anaesthesia. It requires experienced anaesthetist to decrease the incidence of chemosis by delivering the local anaesthetic solution into the posterior subtenon's space but not to the anterior sub-conjunctival space. Chemosis did not affect any surgical steps in our study.<sup>7</sup>

So chemosis is common complication of subtenon's anesthesia and less in peribulbar anaesthesia.

### 6.7.2. Sub conjunctival hemorrhage

In our study, 79.5% patients in group A did not have SCH and 68.4% patients did not have SCH group B. Rest of the patients had SCH of varying degrees in that 1.75% in group A and 2.33% in group B had SCH in 3 or more quadrants. This also did not affect the surgical procedure.

Other complications like ecchymosis were found in 4(2.33%) cases in group A and 8(4.67%) in group B showed ecchymosis. No specific treatment was given and patients were reassured. But patients with myopia having posterior staphylomas are at increased the risk of perforation while giving peribulbar anesthesia for ocular surgery.<sup>8,9</sup>

Group B showed other complications like lid haemorrhage in 2(1.16%) cases and cold compression was applied immediately and surgery was continued. retro-bulbar haemorrhage in 2(1.16%) cases, immediate cold compression was applied and tab. Acetazolamide 250mg was given to lower the IOP. Eye was patched with pressure bandage and surgery was aborted in these two cases and the patients were taken up for surgery after 3 weeks. Post-operative transient ptosis was observed in 2(1.16%) cases. Reassurance was given to these patients and patients did not follow up. 1(0.58%) case showed globe perforation while giving injection at the superior site and the perforation was suspected on table while doing cataract surgery as the globe became very soft and surgery was continued. Post-operative day one vision was 1/60, digital IOP, globe was soft and dilated fundoscopic examination showed media was hazy due to vitreous haemorrhage and B-scan showed suspected self-sealing scleral perforation with streak of vitreous haemorrhage. Case was followed up regularly and after 3 months follow-up examination showed BCVA of 6/18, fundoscopic examination showed media was clear and resolved vitreous haemorrhage.

Patients and surgeons satisfactions were almost same in both the group. Which was not statistically significant.

Cataract surgery requires good akinesia of both eyeball and eyelids. Retrobulbar anaesthesia was the main technique used by many surgeons for a long time previously. Rare but serious complications like globe perforation, optic nerve injury, retro-bulbar haemorrhage, brain stem anaesthesia, postoperative strabismus were noted. These have led many physicians to replace this technique with different techniques of peribulbar blocks.<sup>8,10</sup>

A study by Ghali AM et al demonstrated that both single injection technique and classic double injection techniques were similar in terms of efficacy with a lower total volume of local anaesthetic in the single-injection group. We agree with this finding as we found similar results in our study.<sup>10</sup>

Studies by Mahfouz and Katheri, Clausel et al, and Riad and Nauman also showed by using B-scan ultrasonography to establish the exact pattern of spreading of the injection of peribulbar anaesthesia showed small volume of local anaesthetic (5–6.5 mL) injection in this space is sufficient to spread around the globe and produce analgesia.<sup>11</sup>

Single percutaneous peribulbar technique is effective in providing both analgesia and akinesia for cataract surgery. Both techniques are similar in terms of efficacy and offers excellent anaesthesia and akinesia in the single-injection group as same as double injection technique of peribulbar anesthesia.

Single injection technique avoids many complications associated with the double injection technique. Single injection peribulbar technique was associated with only minor complications and discomforts, which explains the patient's better acceptability. Single injection technique was more comfortable for the patient at the time of administration of anaesthetic agent and during the surgery as complications like SCH and chemosis were present in fewer cases compared to double injection technique. Pain and discomfort while injecting the anaesthetic agent was less in single injection technique.

A study by El Said TM et al, the results showed the globe akinesia and globe anaesthesia were better in double injection classic peribulbar anaesthesia than single peribulbar injection group. But, they were not statistically significant. Surgeons find it difficult to do cataract surgery without complete akinesia and anaesthesia during vitreoretinal surgery as reported by many authors. So, supplemental block in peribulbar anaesthesia remains the major constraint of this technique. Reported incidence is between 5 and 63% in various studies.<sup>12,13</sup> In our series akinesia was almost same in both the groups which was statistically insignificant and 4(2.35%) patients in group A and 5(2.92%) patients in group B required repeat injection for good akinesia.

A study by Ball et al.<sup>14</sup> showed that an adequate block can be achieved with a single peribulbar injection placed either infero-temporally (classic technique) or medially (single percutaneous technique). This goes in favour of

single injection being equally effective as compared to double injection technique for good akinesia and analgesia for cataract surgery.

Study by El Said TM et al also showed that second primary peribulbar injection is unnecessary and may carry an increased risk of globe perforation.<sup>15</sup> Therefore, they recommended use of second injection only when required. This indicates complications increases as the number of injection increases.

The ciliary nerves are responsible for sensation of the eyeball they emerge from the globe and cross the episcleral space. The Tenon's capsule extends to all the extraocular muscle sheath. This explains why the anaesthetic is preferentially guided to this muscle sheath to produce good akinesia; also, the fascial sheath of the eyeball guides the injected solution to the lids, especially to the orbicularis muscle preventing blinking during surgery without performing any facial nerve block. This explains why single percutaneous technique is more effective than the classic peribulbar technique.<sup>15</sup>

Our study showed complications of peribulbar anaesthesia like retro-bulbar haemorrhage, globe perforation, lid haemorrhage, post-operative transient ptosis were noted in group B double site injection peribulbar anaesthesia. Minor complications like chemosis and sub-conjunctival haemorrhage, post-operative pain and discomfort are little less in group A patients when compared to group B patients. This shows that complications increases as the number of injection increases.<sup>15</sup>

Injection in the superior quadrant is difficult for the beginners as it is having less space for safe injection compared to lower injection site and in our study we observed that 2 patients had retro-bulbar haemorrhage and 1 patient had globe perforation and both were observed while giving superiorly. So it is better to avoid the multiple injection especially the superior site for the beginner and for the better comfort of the patient.

## 7. Conclusion

Both single site and double site injection technique peribulbar anaesthesia provide adequate analgesia, akinesia and anaesthesia during cataract surgery.

Single site injection of peribulbar anaesthesia is preferred technique as it is less painful during administration and risk of globe perforation and retro-bulbar haemorrhage is less compared to double site peribulbar anaesthesia.

Complications like chemosis and sub conjunctival haemorrhage are comparatively more in double site injection as the volume of injection is high and number of injection sites are more. However these complications are not clinically significant.

Surgeons need to be cautious while administering anaesthesia due to the possible serious complications like retro-bulbar haemorrhage and globe perforation. Single site injection technique of peribulbar anaesthesia is preferred

to reduce the risk due to additional injection given in the double injection technique of peribulbar anaesthesia in cataract surgery.

## 8. Source of Funding

None.

## 9. Conflict of Interest

None.

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