

Complications of classic double injection technique of peribulbar anaesthesia given in supine position before cataract surgery



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ABSTRACT

Background: Peribulbar anaesthesia has almost totally replaced general anaesthesia and retrobulbar block for ocular procedures especially in adults. Peribulbar block involves injections above and below the orbit, with local anesthetic deposited within the orbit but does not enter the muscle cone. Relatively safe but it is still associated with complications which are detailed in this study. **Aims and Objective:** To study the complications of classic double injection technique of peribulbar anaesthesia given in supine position before cataract surgery and to find the percentage of patients achieving complete block with 7ml of anaesthetic solution given by peribulbar route. **Materials and Methods:** This prospective observational study was conducted on 500 patients who were admitted for undergoing cataract extraction surgery in the Department of Ophthalmology in GMC Jammu for a period of 8 months from December 2018 to July 2019. **Results:** It was observed that 103 patients out of 500 (20.6%) developed one or more of complications. Chemosis was the most common complication which occurred in 87 (17.4%) patients followed by subconjunctival haemorrhage observed in 19 (3.8%) patients. Lid ecchymosis occurred in 16 (2.4%) patients. Retrobulbar haemorrhage occurred in 11 (2.2%) patients. 2 (0.4%) patients developed severe lid edema. In 2 (0.4%) patients wrong eye was given block. 1 (0.2%) patient developed CRAO. Complete akinesia was obtained in 415 (83%) patients with 7ml of block. Rest required supplementary injections. 14 (2.8%) patients did not attain full akinesia after 12ml of block. **Conclusion:** Peribulbar block is a relatively safe procedure for obtaining ocular analgesia and akinesia, but is still associated with complications ranging from minor lid edema and chemosis to grave events like RBH to CRAO.

Key words: Cataract; Double injection technique; Peribulbar anaesthesia; Supine position

INTRODUCTION

Peribulbar block involves injections above and below the orbit, with local anesthetic deposited within the orbit but does not enter the muscle cone. This technique blocks the ciliary nerves, as well as CN III and VI. It is the most common technique of anaesthesia given before several intraocular as well as extraocular procedures at our setup. Since, the general anaesthesia methods are fraught with plethora of systemic complications, so have been almost totally replaced by regional anaesthesia for ocular procedures especially in adults. Apart from reduced systemic complications, enhanced ability to handle large volumes of surgeries, reduced cost

and overall enhancement in operating room efficiency is the other important advantages of regional anesthetic methods. The aims of the study were to study the complications of classic double injection technique of peribulbar anaesthesia given in supine position before cataract surgery and to find the percentage of patients achieving complete block with 7ml of anaesthetic solution given by peribulbar route.

MATERIAL AND METHODS

This prospective observational study was conducted on 500 patients who were admitted for undergoing cataract

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extraction surgery in the Department of Ophthalmology in GMC Jammu from December 2018 to July 2019. Clearance was taken from our hospital's ethical committee for the study.

Inclusion criteria

Patients who underwent cataract surgery by ECCE, SICS or Phacoemulsification with IOL implantation, patients of age 50-80yrs and of either sex who gave consent to participate in the study were enrolled.

Exclusion criteria

Patients who are mentally impaired, deaf and dumb, unable to communicate, impaired ocular motility, abnormalities of lid. Patients with uncontrolled diabetes mellitus, hypertension, asthma, cardiac pathologies were excluded.

A 7ml mixture containing 4ml of 2% lignocaine and 3ml 0.5% bupivacaine with hyaluronidase 15 IU/ml was prepared in a 10 ml syringe. Patient was made to lie in supine position with eyes slightly open. A 3.5ml of solution was injected via inferotemporal injection (above the junction of medial 2/3rd and lateral 1/3rd of infraorbital rim). Second, 3.5ml was given via superonasal injection (below the junction of medial 1/3rd and lateral 2/3rd of supraorbital rim). This is followed by gentle digital massage for 5-10 mins (Image 1). We compared the movement of 2 eyes in all 4 directions to access the level of ocular and lid akinesia.

A 3 point scoring system was used to measure the response –scoring from 0 to 10.

- 0 - flicker / no movement,
- 1 - reduced movement,
- 2 - normal movement.

Movement in up gaze, down gaze, movement to right and left and lid opening (each scored from 0 to 2). Successful block was defined by total score of <3 (Image 2). If block wasn't successful after 10 mins, it was supplemented by 2-5ml of 2% lignocaine via inferotemporal injection.

RESULTS

The study enrolled 285 males comprising 57% and females 215 comprising 43% of the total patients (Table 1). Majority of the patients were in the age group of 61-70 years contributing 53% of the total patients. 51-60 years group had 18% and 71-80% had 29% of the patients (Table 2).

Systemic

Though several studies reported systemic complications like allergic reactions to drugs, anaphylaxis, syncope and bradycardia (oculocardiac reflex) but none was observed in our study.

Ocular

It was observed that 103 patients out of 500 (20.6%) developed one or more of complications. Block remained uneventful in 397 (79.4%) patients (Figure 1). Females reported greater complications than males and comprised 56.31% of patients who developing the adverse effects (Table 3). Chemosis (Image 3) occurred in 87 (17.4%) patients which settled with digital massage. Subconjunctival haemorrhage occurred in 19 (3.8%) patients. Lid ecchymosis occurred in 16 (2.4%) patients. Retrobulbar haemorrhage occurred in 11 (2.2%) patients which were treated with oral acetazolamide and pressure patching. 2(0.4%) patients developed severe lid edema (Image 4) due to accidental vessel puncture and had to be postponed. In 2 (0.4%) patients wrong eye was given block which were corrected to correct eye before undergoing surgery. 1 (0.2%) patient developed CRAO (Table 4). Many patients had more than one complication simultaneously like

Table 1: Sex distribution of patients

S.No.	Gender	Number of patients	Percentage (%)
1	Male	285	57
2	Female	215	43
	Total	500	100

Table 2: Age distribution of patients

S.No.	Age (years)	Number of patients	Percentage (%)
1	51-60	90	18
2	61-70	265	53
3	71-80	145	29
	Total	500	100

Table 3: Sex distribution of patients who experienced complications

S.No.	Gender	Number of patients	Percentage (%)
1	Female	58	56.31
2	Male	45	43.67
	Total	103	100

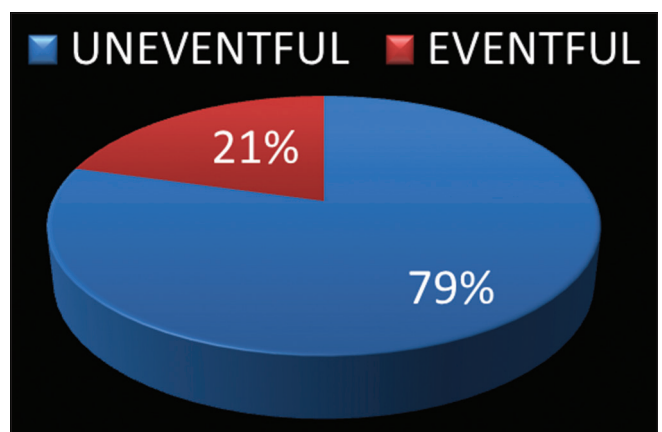


Figure 1: Percentage of patients developing complications

developing chemosis (Image 5), lid edema and subconjunctival haemorrhage (Image 6). No patient in our study developed vitreous haemorrhage or globe perforation.

Lid ecchymosis could lead to poor postoperative cosmetic outcome with periocular blackening which takes 2-3 weeks to resolve (Image 7).

Complete akinesia was obtained in 415 (83%) of patients with 7ml of block. Rest required supplementary injections. 14 (2.8%) patients did not attain full akinesia after 12ml of block (Figure 2) and were supplemented by facial block if desired by operating surgeon.

DISCUSSION

Peribulbar block is a relatively safe procedure for obtaining ocular analgesia and akinesia. The circumferential diffusion of the local anesthetic with the addition of hyaluronidase blocks the ciliary nerves, as well as cranial nerve III and VI explains the achievement of adequate akinesia with this technique. It is still associated with complications ranging from minor lid edema and chemosis to grave events like retrobulbar haemorrhage to central retinal artery occlusion.

In a multicentric study by David B et al., (1994)¹ 95% of patients achieved a 95% or greater degree of akinesia which is similar to 97% akinesia with supplementary injection as in our study.

Table 4: Complications caused by peribulbar anaesthesia

Complication	Number of patients			Percentage (%)
	Male	Female	Total	
Chemosis	36	51	87	17.7
Sub. Hmg.	10	9	19	3.8
Ecchymosis	7	9	16	2.4
RBH	7	4	11	2.2
Severe lid edema	0	2	2	0.4
Wrong eye	1	1	2	0.4
CRAO	1	0	1	0.2

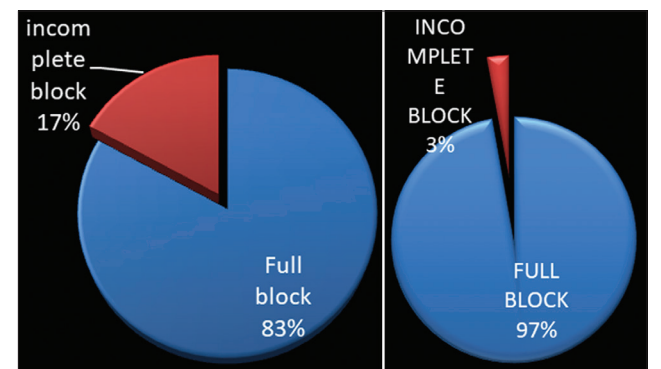


Figure 2: (a) Percentage of patients achieving complete block with 7 ml of drug, (b) Percentage of patients achieving complete block with 12 ml of drug

Talking about the complications experienced conjunctival chemosis was documented in four trials (Athanihar 1991²; Ali-Melkkila 1992³; Ali-Melkkila 1993⁴; Wong 1993⁵) to be the most common complication from peribulbar blocks (17.4%). This is similar to the results of our study (chemosis 17.7%). Ghali AM et al.,(2011)⁶ documented 16% chemosis rate with single injection peribulbar anesthesia with a short needle. Budd et al., (2001)⁷ have reported conjunctival chemosis as the most common complication in almost 10% of the subjects undergoing peribulbar block, with no systemic complications. Chemosis may be due to more anterior delivery of the anaesthetic agent in the orbit and the generally larger volume of anaesthetic injected into the eye.

The needle related complications were subconjunctival haemorrhage observed to be 13.8%, lid ecchymosis occurred in 2.4% and retrobulbar haemorrhage 2.2% of all subjects. The most likely source of bleeding is the conjunctival vessels, which get injured, cut or sheared during the process of creating a conjunctival entry site for the cannula to pass into the peribulbar space. Although this does not necessarily have any direct morbidity associated with it, a chemosed hemorrhagic conjunctiva not only results in an unsightly postoperative eye but

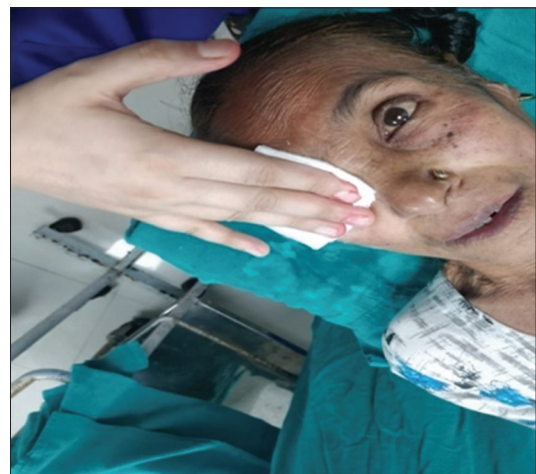


Image 1: Massage after injecting peribulbar block

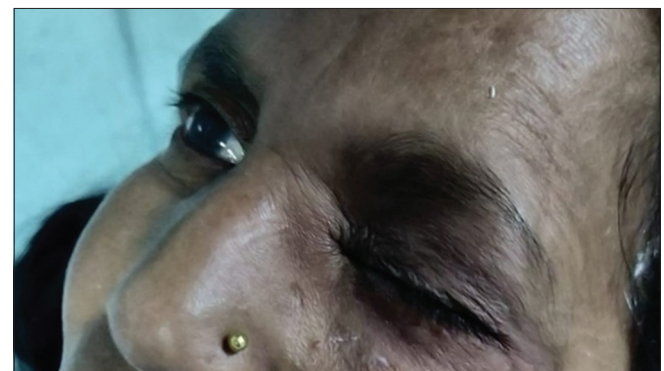


Image 2: Complete ocular block



Image 3: Chemosis

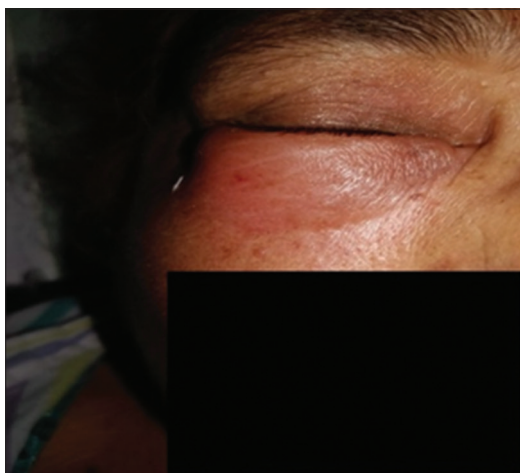


Image 4: Lid edema

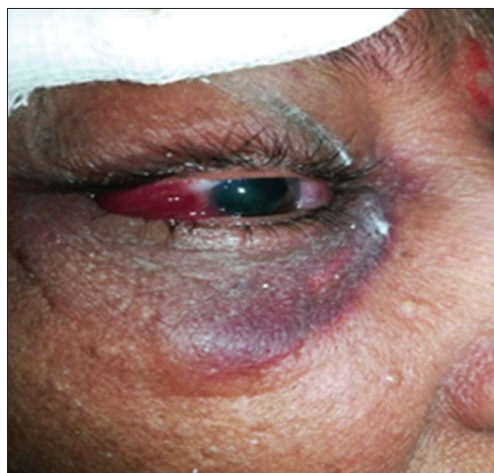


Image 6: Lid edema with ecchymosis, Conjunctival chemosis and Subconjunctival haemorrhage



Image 5: Congestion and chemosis

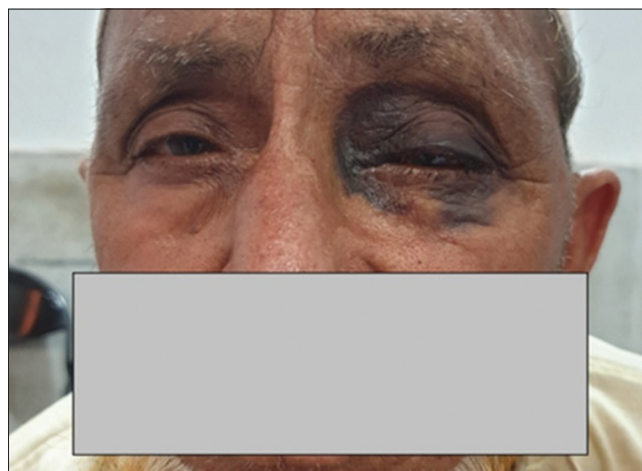


Image 7: Postoperative patient with lid ecchymosis because of peribulbar block

can also make visualization during cataract surgery more challenging owing to pooling of ocular surface fluids. One trial (Ali-Melkkila 1993)⁴ reported lid haematoma as a local complication of block and the rate was 2.7% in peribulbar group. Gauba et al., reported in a study that controlled localized bipolar conjunctival cautery before administering block may significantly reduce the frequency of subconjunctival haemorrhage. Perforation was reported by David B et al., (1994)¹ in 1 case (0.006%) which is quiet similar to 0% of our study.

No systemic complications were reported as far as our study is concerned. Feibel (1993) found no major systemic complications in any of his trials. David B et al.,(1994)¹ too mentioned that no cases of cardiac or respiratory depression or deaths were reported in their study. Kumar C.M. Dowd T.C. (2006)⁸ also concluded from their study on regional ophthalmic blocks that complications following ophthalmic regional anaesthesia are rare but are reported

during needle and blunt cannula techniques including peribulbar block.

CONCLUSION

At present there is no perfect technique of ophthalmic regional anaesthesia. Their complications are unavoidable and unpredictable. Despite the complications, peribulbar block remains the preferred method for ocular anaesthesia. There is a significantly high patient and surgeon satisfaction with peribulbar block. The current study even though had reported a higher proportion of local complication, no case of systemic complication or optic nerve damage was reported. Hence, ophthalmologists must be prepared to deal with rare but serious complications that can occur with peribulbar anaesthesia.

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Authors Contribution:

SK- Concept and design of study and prepared first draft of manuscript; **SR-** Interpreted the results and reviewed the literature; **DG-** Supervision, preparation and review of manuscript.

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