



Retrobulbar haemorrhage: A complication of peribulbar anesthesia in patient undergoing cataract surgery

Anneshi RC¹, Sandhya R^{2*}, K Kanthamani³

¹ Junior Resident, Department of Ophthalmology, Sri Devaraj Urs Medical College, Tamaka, Kolar, Karnataka, India

² Professor and HOD, Department of Ophthalmology, Sri Devaraj Urs Medical College, Tamaka, Kolar, Karnataka, India

³ Professor, Department of Ophthalmology, Sri Devaraj Urs Medical College, Tamaka, Kolar, Karnataka, India

Abstract

Purpose: To know the incidence of retrobulbar haemorrhage associated with peribulbar anesthesia in cataract surgery patients.

Materials and Methods: A retrospective study involving 170 patients from February 2020 to March 2020 undergoing cataract surgery were included in the study.

Results: 2(1.17%) cases presented with retro-bulbar haemorrhage out of 170 cases.

Conclusion: Retro-bulbar haemorrhage, a complication associated with peribulbar anesthesia requires diagnosis and early treatment to avoid complications, aborting and postponing the surgery is mandatory.

Keywords: retro-bulbar haemorrhage, chemosis, peribulbar anaesthesia, compartment syndrome

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, subtenon's injection or under topical anaesthesia. Retrobulbar anaesthesia was commonly used for cataract extraction by many ophthalmologists. But some serious complication like globe perforation and optic nerve injury and retrobulbar haemorrhage are more common when compared to peribulbar anaesthesia.

Peribulbar anaesthesia has gained popularity over the last few years as it showed less potential complications of globe perforation and optic nerve injury, relatively safe, easy to perform and effective in inducing ocular akinesia and anaesthesia. Serious complications following orbital regional anaesthesia are rare, but occur following both needle and blunt cannula (sub-Tenon's) techniques. Each technique of orbital regional anaesthesia has its own risk/benefit profile. Ophthalmologists and ophthalmic anaesthesiologists must be prepared to deal with rare, but serious complications that can occur with any technique of orbital regional anaesthesia. However, some complications like conjunctival chemosis, subconjunctival hemorrhage and risk of injury to intraorbital structures were also seen to a minimal extent in this peribulbar anaesthesia technique. Peribulbar technique also may have the potential risk of optic nerve injury, retro-bulbar hemorrhage and globe perforation, in particular the patients with shallow orbits [1, 2].

Retro-bulbar haemorrhage is a serious complication of both the intraconal and extraconal blocks, which occurs following bleeding behind the globe. The hemorrhage may be either venous or arterial in origin and may be concealed, or revealed. Spread of blood into the periorbital tissues increases the tissue volume and pressure.

Objectives of study

To know the incidence of retrobulbar haemorrhage associated with peribulbar anesthesia in cataract surgery patients.

Materials and Methods

Source of data

A total of 170 eyes fulfilling the inclusion criteria were selected from ophthalmology inpatient department at tertiary rural hospital between February 2020 to March 2020, after obtaining the approval from Institutional Ethics Committee.

Study design: Cross sectional observational study.

Study period: February 2020 to March 2020.

Sample size: A total of 170 eyes fulfilling the inclusion criteria were selected.

Inclusion criteria

All patients underwent cataract surgery between the age group of 40years-90 years.

Exclusion criteria

1. Sensitivity to anaesthetic agent
2. Hypertensive patients
3. Hypermature and pseudoexfoliation cataract patients
4. Complicated cataracts

Method of collection of data

A total of 170 eyes fulfilling the inclusion criteria were included in this study. After obtaining the written informed consent all the patients underwent similar protocol for standard cataract evaluation, which consists of detailed history, recording of visual acuity, intraocular pressure, slit lamp examination, fundus evaluation and intraocular lens power calculation followed by certain basic investigations such as blood sugar levels, HIV, HBsAg, ECG.

All patients were on oral tab Ciprofloxacin 500mg twice daily and Ciprofloxacin 0.3% eye drops hourly one day before the surgery. Preoperatively pupils were dilated with tropicamide with phenylephrine 0.5% drops along with flurbiprofen 0.03% drops.

Before giving peribulbar block for both the groups a test dose of the local anaesthetic injection (equal volume of 2% lignocaine with adrenaline 1:2,00,000 and 0.5% bupivacaine) were given for every patient and observed for any adverse reaction.

Peribulbar injection technique

5ml of local anaesthetic injection will be given at two sites, first 3ml in the lower orbital margin at the junction of lateral one-third and medial two-third and second 2ml in the superior orbital margin at the junction of medial one-third and lateral two-third using 24G (25mm in length) needle, intermittent digital pressure for 15 minutes.

Results

A total of 170 patients who underwent cataract surgery were included in this study of which 80 were males and 90 were females with mean age of participants were found to be 64.36+/-5.686 years.

While giving the peribulbar anaesthesia, standard operating procedure was followed. Complications associated with peribulbar anaesthesia were noted. 2(1.17%) cases presented with retro-bulbar haemorrhage. OT was aborted for these 2 cases and managed appropriately.

Discussion

Complication associated with the peribulbar anesthesia are comparatively less when compared to retro-bulbar anesthesia. Complications noted will be chemosis, sub conjunctival haemorrhage, ecchymosis, lid haemorrhage, retro-bulbar haemorrhage, globe perforation. Optic nerve injury will be rare in case of peribulbar anesthesia as its incidence is more in case of retro-bulbar anesthesia where injection of anesthetic agent in the central space of the orbit just adjacent to the optic nerve.

In a study involving 19,000 patients who had retrobulbar and peribulbar blocks, the incidence of retrobulbar hemorrhage was only 0.03%.³ An incidence ranging between 0.4% and 1.7% have also been reported [4, 5]. Interestingly, in a study which compared the incidence of retrobulbar hemorrhage with different needle techniques, the authors found that the incidence was 0.4% with the peribulbar technique and 0.7% with the retrobulbar technique [4]. Blindness from a retrobulbar hemorrhage has been reported [6], but most patients have a good visual outcome [4, 5].

Venous hemorrhage due to perforation of a vein, is slow in onset and usually presents as markedly blood stained chemosis and raised intraocular pressure. It is possible to reduce the intraocular pressure by intermittent digital pressure with a gauze pad over the closed lids. Before the decision is made to proceed with surgery or postpone it for a few days, it is advisable to measure and record intraocular pressure [7].

Arterial haemorrhage due to perforation of artery occurs quickly and is more difficult to control. Urgent measures must be taken to stop haemorrhage and reduce elevated intraocular pressure. Firm digital pressure usually stops the bleeding. Consideration must then be given to reduce the

intraocular pressure, so that the blood supply to the retina is not compromised. Lateral canthotomy, intravenous acetazolamide, intravenous mannitol or even paracentesis, may need to be considered [7].

The risk of developing retrobulbar hemorrhage is greater, when a long (≥ 38 mm) needle is advanced deep into the orbit where vascular structures are most tightly packed. Larger diameter needles are more likely to cause tear in a blood vessel [8]. Other risk factors suggested, are pre-existing vascular and hemorrhagic diseases [9].

In our study we came across 2 cases of retro-bulbar haemorrhage out of 170 cases of peribulbar anesthesia. Retrobulbar haemorrhage occurred while giving injection in the superior site at the medial one-third and lateral two-third as the space between the globe and the orbital bony wall is very less compared to inferior site. These cases presented with severe pain immediately after anaesthetic injection, marked chemosis with tense lids which are unable to retract. Management of retro-bulbar haemorrhage in our series was done by immediate cold compression was applied and tab. Diamox 250mg was given to lower the IOP. Eye was patched with pressure bandage and surgery was aborted in these cases and the patients were taken up for surgery after 3 weeks.

Conclusion

Retro-bulbar haemorrhage, a complication associated with peribulbar anesthesia requires diagnosis and early treatment to avoid complications, aborting and postponing the surgery is mandatory.

References

1. Kumar CM. Orbital regional anesthesia: Complications and their prevention. *Indian J Ophthalmol.* 2006; 54:77-84.
2. Jaichandran VV. Ophthalmic regional anaesthesia: A review and update. *Indian J Anaesth.* 2013; 57:7-13.
3. Katz J, Feldman MA, Bass EB, Lubomski LH, Tielsch JM, Petty BG, *et al.* Risks and benefits of anticoagulant and antiplatelet medication before cataract surgery. *Ophthalmology.* 2003; 110:1784-8.
4. Eke T, Thompson JR. The national survey of local anesthesia for ocular surgery II. Safety profiles of local anesthesia techniques. *Eye.* 1999; 13:196-204.
5. Cionni RJ, Osher RH. Retrobulbar hemorrhage. *Ophthalmology.* 1991; 98:1153-5.
6. Puustjarvi T, Purhonen S. Permanent blindness following retrobulbar anesthesia for cataract surgery. *Ophthalmol Surg.* 1992; 23:450-2.
7. Nicol M. Anaesthesia for ophthalmic surgery in *Textbook of Anaesthesia* edr: Aitkinhead AR, Rowbotham DJ, Smith Graham. 4th ed. Churchill Livingstone: London, p594-605.
8. Troll GF. Regional ophthalmic anesthesia: Safe technique and avoidance of complications. *J Clin Anesth.* 1995; 7:163-72.
9. Hamilton RC. A discourse on the complications of retrobulbar and peribulbar blockade. *Can J Ophthalmol.* 2000; 35:363-72.