Complications of Peribulbar Block in the Sitting Posture - An Exploratory Study

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Abstract

Purpose: *To review the complications of peribulbar block (PBB) in sitting posture of the patient.*

Methods: *Retrospective analysis of complications in 211 patients who had been given PBB in sitting posture during 1 year period between April 2015 till June 2016 at a tertiary care hospital (Sankara eye hospital), Guntur was done. These included orbital regional anaesthesia for cataract, trabeculectomy, retinal detachment, other vitreoretinal surgeries etc, both in paying OT and non-paying (camp) OT.*

Results: *Out of 43,200 patients operated in a year at Sankara eye hospital, Guntur who received PBB in sitting posture, 211 patients (0.48%) had block related complications; bradycardia-77 (0.17%) patients; syncope-46 (0.11%); periorbital haematoma-37 (0.08%); retrobulbar hemorrhage-21 (0.05%); Xylocaine hypersensitivity-16 (0.04%); globe perforation-8 (0.02%); wrong eye block-6 (0.01%). All the above were treated and sufficient preventive measures were taken accordingly.*

Conclusion: *Ophthalmologists must be prepared to deal with rare but serious complications that can occur with orbital regional anaesthesia.*

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Keywords: *Peribulbar block, Regional anaesthesia, Complications*

Introduction

Cataract is the most commonly performed surgical procedure by ophthalmologists across the globe. Majority of the affected population are elderly people, often suffering from various co-morbidities. Hence, the general anaesthesia methods, which are fraught with plethora of systemic complications in this population group have been almost totally replaced by regional anaesthesia. Apart from reduced systemic complications, enhanced ability to handle large volumes of surgeries, reduced cost and overall enhancement in operating room efficiency are the other important advantages of regional anesthetic methods.[1]

Since the first reported injection of local anesthetics into eye for enucleation of the globe in 1884,[2] it took almost more than 5 decades for orbital blocks to be routinely used in eye surgery. In 1936, Atkinson's[3] described a new method, which was firmly established as traditional retro bulbar block. There were further modifications in the methods suggested by subsequent authors like Unsold et al[4] to reduce the risk of optical nerve injury.[5]

But in recent times, retro bulbar block has been progressively phased out and replaced by easier and safer methods of regional block. These methods include peribulbar block, sub-Tenon's block (STB) and topical anaesthesia (TA).[6] Due to diminished requirements for total akinesia due to advances in surgical methods like phacoemulsification, these non-akinesia methods have quickly become popular across the globe.

But in resource poor and highly populated settings, still major portion of the ocular surgeries are performed by traditional methods, for their higher cost effectiveness. Considering the high volumes of surgeries performed, there is huge pressure on the institutions to further enhance the operation room efficiency. Hence administering the block in sitting position is another alterative, which can significantly reduce the overall block administration time. But due to concerns regarding increased risk of various local and systemic complications, this is routinely not practiced.

As per the recent report of National Programme for Control of Blindness, there is huge burden of untreated cataract in the country. Out of 66,00,000 targeted cataract surgeries envisaged, only 16.82% could be completed during 2015-16. More operational efficiency achieved by administration of the block in sitting position can have a huge positive impact in these kind of settings in reducing the burden of untreated cataract at the community level. If this can be achieved without putting the subjects at undue risk of complications, the overall risk benefit ratio will be highly in favor of block in sitting posture. Hence many centers performing high volume surgeries across the country routinely administer peribulbar block in sitting position. But there are no published studies reporting the incidence of various local and systemic complications of peribulbar block in the sitting position.

Objectives

1. To assess the operational aspects of peribulbar block in the sitting position i.e block administration time and volume of anesthetic.
2. To assess the occurrence of various ocular and systemic complications during peribulbar block in the sitting position.

Materials and Methods

The study was a retrospective analysis of all the cases who underwent peribulbar block in sitting position in Sankara eye hospital, Guntur (tertiary eye care center). All the cases who underwent the procedure between April 2015-June 2016 were included in the analysis.

The study included all the subjects who underwent either ECCE, SICS, Phacoemulsification with IOL, Trabeculectomy,

Vitreo retinal surgeries, Keratoplasty, Pterygium etc. Patients with uncontrolled diabetes mellitus, hypertension, bronchial asthma, cardiac illness were excluded from the study. The other exclusion criteria were pediatric age group and trauma.

Methodology

After obtaining the informed written consent, a thorough history was taken from each participant. Thorough clinical examination was done on each subject. Blood pressure and pulse oximetry were measured before giving anaesthesia.

The block was administered in sitting position with the patient keeping the eyes in primary gaze. A 23G, 25 mm long needle was inserted inferotemporally into the orbit and 4-5 cc of 1% Xylocaine was injected into the peribulbar space. This was followed by eye massage with pinky ball or digital massage. In addition, 3-4 cc of Xylocaine was supplemented medially/superomedially into the orbit.

Various orbital, systemic, pharmacological agent related and needle or canula related complications were noted.

Statistical Analysis

Descriptive analysis was carried out by frequency and proportion for categorical variables. The overall incidence of complications were presented along with 95% Confidence intervals. The incidence of specific complications were also presented along with 95% Confidence intervals, which were calculated by Yates, continuity correction, considering very small sample size. The other parameters were summarized appropriately using range.

Results

There were a total of 43,200 people who received anesthesia in the sitting position, out of which, 211 (0.49%) people developed at least one complication (95% CI 0.43-0.56).

The patients with complications were within the age group of 40 - 90 years. The female to male ratio for these patients was 1.3:1. The waiting time for the surgery after giving anesthesia was about to 1-3 hours and the block duration was 10-25 minutes for these 211 patients. The volume of anesthetic injected in the patients who developed complications was 4-10 cc.

Figure 1: *Patient given peribulbar block in sitting position*

The proportion of patients developing systemic complications was 0.28% (0.23 to 0.33) in the study. Vasovagal attacks & bradycardia was the most common systemic complication seen in 0.18% (95% CI 0.14-0.22), followed by brainstem anesthesia & syncope seen in 0.11% (95% CI 0.08-0.15).

The incidence of orbital complications was 0.17% (0.14 to 0.21). Out of the orbital complications, the most common complication was periorbital hematoma seen in 0.09% (95% CI 0.07-0.12), followed by retrobulbar hemorrhage seen in 0.05% (95% CI 0.03-0.08), globe perforation seen in 0.02% (95% CI 0.01- 0.04) and wrong eye block in 0.01% (95% CI 0-0.02). Hypersensitivity to xylocaine was seen in 0.04% (95% CI 0.03-0.06). No case of cannula based complications were reported in the study (Table 1).

Table 1: Descriptive analysis of various complications (N=43,200)

Complications	Number	Proportion	95% CI (With Yates continuity correction)
Systemic complications			
• Vasovagal attacks & bradycardia	77	0.18	0.14 to 0.22
• Brainstem anesthesia & syncope	46	0.11	0.08 to 0.15
• Total systemic complications	123	0.28	0.23 to 0.33
Orbital complications			
Retrobulbar Hemorrhage	21	0.05	0.03 to 0.08
Periorbital hematoma	37	0.09	0.07 to 0.12
Globe perforation	8	0.02	0.01 to 0.04
Wrong eye block	6	0.01	0 to 0.02
Total orbital complications	72	0.17	0.14 to 0.21
Pharmacological complications			
Hypersensitivity to Xylocaine	16	0.04	0.03 to 0.06
Cannula based complications			
Optic nerve damage	0	0	0
Myotoxicity	0	0	0

Discussion

Achieving operation room efficiency without putting the patients to undue risk of complications may be extremely useful to deal with high volume of ocular surgeries. This in the long run may reduce the waiting period and can have a significant impact on reducing the overall burden of untreated ocular morbidities in countries like India. As there are no studies available on complications of peribulbar block in the sitting position, we did this study in our hospital.

Even though administration of the peribulbar block for various ocular surgeries has been reported to be in practice in many specialty centers in India, the current study is the first formal reporting of various operational aspects. The overall incidence of complications reported in this study was 0.49% (95% CI 0.43% to 0.56%). In study by Riad et al,[7] the total incidence of complications was 0.12%, which is considerably lower than the current study. But this study included all types of regional block. Budd et al[8] have reported conjunctival chemosis as the most common complication

in almost 10% of the subjects undergoing peribulbar block, with no systemic complications.

In the current study, the proportion of patients developing systemic complications was 0.28% with vasovagal attacks & bradycardia seen in 0.18%; and brainstem anesthesia & Syncope seen in 0.11%. Out of 0.17% of orbital complications, we found periorbital hematoma (0.09%) and retrobulbar hemorrhage (0.05%) to be the most common. Riad et al[7] have reported the incidence of systemic complications as 0.059%, which included oculocardiac reflex, central spread, and stress-induced epilepsy; and needle-related complications as 0.075%, including globe perforation, retro bulbar hemorrhage, lid hematoma, subconjuctival hemorrhage, and optic nerve damage. The current study even though had reported a higher proportion of systemic and local complication, no case of optic nerve damage was reported.

Davis et al[9] have reported the incidence of complications in their study, with orbital hemorrhage accounting for 0.74% of cases. There was one globe perforation (0.006%), two expulsive hemorrhages (0.013%), one grand mal seizure (0.006%), and no cases of cardiac or respiratory depression or deaths. This study findings are comparable to the current study.

In a recent review, retrobulbar hemorrhage was reported in 0.3% of the participants in the retrobulbar group and no report of retrobulbar hemorrhage in the peribulbar group (Athanikar 1991), which is correlating with our study. Conjunctival chemosis was documented in four trials (Athanikar 1991; Ali-Melkkila 1992; Ali-Melkkila 1993; Wong 1993). The risk for conjunctival chemosis was more with the peribulbar group (17.4%) than the retrobulbar group (7.1%). This may be due to more anterior delivery of the anaesthetic agent in the orbit and the generally larger volume of anaesthetic injected. One trial (Ali-Melkkila 1993) reported lid haematoma as a local complication. The rate was much higher in the retrobulbar group (7.3%) than the peribulbar group (2.7%) (p = 0.03). Persistent ptosis occurred in 1.1% of the participants in the peribulbar group and 1.3% participants in the retrobulbar group. There was no difference in the risk of having ptosis between the two groups. Only one study reported on this outcome (Feibel 1993). No major systemic complications were reported in any of these trials.

To conclude, peribulbar block in the sitting position significantly reduces overall the block administration time and administration of peribulbar block does not unduly increase the risk of local or systemic complications, hence it can be considered safe.

Limitations

1. Lack of appropriate internal comparison group results in poor validity of the study findings.
2. The role of alternate explanations like bias, confounding by various patient - related as well as investigator related parameters could not be ruled out or assessed scientifically.

Recommendations

1. There is a strong need to conduct scientifically designed randomized controlled trials on the subject to generate better quality evidence.

Bibilography

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