

A Comparison of Peribulbar and Retrobulbar Anaesthesia for Cataract Surgery.

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This prospective study was done to compare Peribulbar and Retrobulbar anaesthesia for cataract surgery with intra ocular lens implant. Sixty patients with simple senile mature cataract of ASA I- III were randomly allocated to receive either of two anaesthetic blocks. PB was given by two points injection technique while in RB single inferolateral site was used. Facial nerve was blocked by O'Brien technique prior to each block. A local anaesthetic mixture comprising of equal volumes of 0.5% Bupivacaine and 2% Xylocaine plain was used. Results showed no statistically significant difference between two blocks. However, akinesia was slightly better with RB but anaesthesia was better with PB. Patient needed less reblocks with RB. No major complications occurred in both techniques. In conclusion, PB is comparable to RB in providing optimal operative conditions in cataract surgery.

Key words: Peribulbar anaesthesia, Retrobulbar anaesthesia, Cataract surgery.

Regional anaesthetic techniques for eye surgery have been successfully practised for more than a century. The regional techniques not only avoid the higher costs but also the inherent risks of general anaesthesia^{1,2,3}. However regional techniques are not free of complications. Retrobulbar block and Peribulbar block are the two most commonly used techniques practiced today.

The aim of this study was to compare R.B. & P.B. in cataract surgery with respect to anaesthesia & akinesia, incidence of block supplementation, patient acceptance & complication rate.

Materials and Methods

Sixty patients of either sex undergoing cataract surgery with intraocular lens implant of ASA status 1 to 3 were selected. Exclusion criteria included existence of language barrier, deafness, claustrophobia and dementia. Thirty patients were given R.B. & thirty P.B. on random basis.

First Facial nerve was blocked by O' Brien technique followed by R.B. or P.B. A local anaesthetic mixture of 2% Xylocaine and 0.5% Bupivacaine was used.

Complications

Various complications have attributed to both blocks. These include chemosis, bruising, Retrobulbar hemorrhage⁴, globe perforation or penetration^{5,6,7} optic nerve atrophy,⁸ brainstem anaesthesia,⁹ oculocardiac reflex¹⁰, amourasis¹¹, ptosis, entropion¹² and diplopia¹³.

Results

Table I: Demographic data of the patients (Mean \pm SD)

	Retro-bulbar Block N=30	Peribulbar Block n=30	P. Value
Age (Years)	65.20 \pm 1.5	63.63 \pm 1.4	0.390
Weight (kg)	62.36 \pm 1.8	66.80 \pm 1.9	0.101
Height (cm)	163.10 \pm 2.8	160.01 \pm 2.5	0.425
Male Female	13:17	16 : 14	0.438
ASA Physical Status I, II, III	18, 9, 3	20, 9, 1	-
Duration of Surgery (min)	36.93	33.96	-

Table II Quality of Globe Akinesia after Anaesthetic Block

Technique of Block	Excellent (Score = 0)	Adequate (Score=1&2)	Un-satisfactory (Score = 3)
P.B	6(20%)	17(56.6%)	7(23.3%)
R.B	7(23.3%)	18(60.0%)	5 (16.6%)

P. Value = 0.802 (NS)

Table III Efficacy of block

Type of Block	Successful Blocks	Reblocks	Total
R.B	25(83.3 %)	5(16.6 %)	30
P.B	23(76.6 %)	7(23.3 %)	30

P. Value \leq 0.002 (NS)

Table IV: Quality of Analgesia in the two Groups

Pain Score	No Pain	Slight Pain	Moderate Pain	Severe Pain
	0 & 1	2	3	4
P.B	26(86.6%)	4(13.3%)	Nil	Nil
R.B	23(76.6%)	6(20.0%)	1(3.3%)	Nil

P. Value = 0.578 (NS)

Discussion

There is evidence that in the elderly patients having cataract surgery, the endocrine and the metabolic responses seen during general anaesthesia are inhibited by local anaesthesia¹⁴

Retrobulbar injection of local anaesthetic (Cocaine) was first described in 1884 by Knapp for enucleation of the eye.¹⁵ In R.B. the needle tip lies within the muscle cone, formed by four recti muscles and the oblique muscles connected by intermuscular septae and adipose tissue. R.B. is a low volume technique requiring usually 4 ml. of LA solution and it has rapid onset of action of 3 to 5 minutes. Although R.B. provides reliable anaesthesia and akinesia, its use has been associated with serious complications.^{4,5,6}

Peribulbar block was first described by Davis and Mandel as alternative to R.B. in 1986.¹⁶ This is called extraconal block because the needle tip remains outside the muscle cone. The P.B. depends on the diffusion of anaesthetic solution into the muscle cone across the

connective tissue. Thus, it requires higher volumes usually 8 ml of anaesthetic solution and it has slower onset time, typically 8 to 12 minutes. Although P.B technique appears to lessen the risk of inadvertent globe perforation, the occurrence serious complications is not completely eliminated^{6,7}

Both types of blocks are unable to provide complete akinesia of the eyelids. Various techniques for facial nerve block are used to achieve akinesia of the orbicularis oculi.

This study was done to assess the efficacy of two blocks regarding anaesthesia & akinesia, incidence of block supplementation, patient comfort and the quality of operative conditions.

The presence of globe akinesia is required for optimal surgical conditions. In the study done by Ali Melikkila et. al. excellent akinesia was achieved in 69 % in R.B and 54% in P.B group¹⁷. The adequate blocks numbered 18 % in R.B and 11 % in P.B. Our study showed similar trend but differed in actual values. Ali Melikkila had used slightly larger volumes of L.A mixture alongwith hyaluronidase. The use of last agent is said to improve the quality of globe akinesia. Murdock in 1990 had shown better globe akinesia with P.B technique as compared to R.B.¹⁸ He used hyaluronidase mixed local anaesthetic in P.B only. In 1989, Weiss et. al. had also demonstrated lower mean akinesia score with P.B as compared to R.B.¹⁹

Different supplementation rates reported in literature are:

- By Hamilton et. al. R.B 9 % (high volume) & 19.8 % (low volume)²⁰
- By Weiss et. al. R.B – 21 % & P.B – 28 %¹⁹
- By Shriver et.al. R.B – 6.8 % & P.B – 4.4 %²¹
- By Ali Melikkila R.B – 13 % & P.B – 35 %¹⁷

There is no unified scoring system for pain in the studies on regional block in eye. Murdock in 1990 showed lower mean pain scores for P.B group (1.9) as against 2.6 for R.B group, when questioned to the patient.

No major complications were noted in our study. Shriver et. al.,^{17,21} Ali Melikkila et. al. & Weiss et. al. found no occurrence of major complications in either technique.²¹ However, Murdock reported one case of Retrobulbar hemorrhage during R.B.

Conclusion

Our study showed comparable results with both techniques as far as globe anaesthesia & akinesia, block supplementation and operative conditions were concerned. It did not show any significant difference in occurrence of complication rate as no major complication resulted with

either technique. However, the beginners in the field of anaesthesia may prefer the inherent simple nature and less deep injection technique of PB.

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