Original Research Article

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Comparison of 0.5% Bupivacaine and Dexamethasone with 0.75% Ropivacaine and Dexamethasone in Peribulbar Block for Small Incision Cataract Surgery: A Prospective Randomized Study

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Abstract

Objective: To compare the anaesthetic efficacy and postoperative analgesia of 0.75% ropivacaine and 2mg dexamethasone with 0.5% bupivacaine and 2mg dexamethasone in peribulbar block for patients undergoing small incision cataract surgery. *Methods*: 50 patients were divided into 2 groups of 25 each and were randomized to receive peribulbar anaesthesia using 0.5% bupivacaine and 2mg dexamethasone in group I and 0.75% ropivacaine and 2mg dexamethasone in group II. The patients were compared for the duration of akinesia and postoperative analgesia. *Results*: Akinesia was achieved slower in group I (14.12±2.99 mins) when compared to group II (8.24± 1.05 mins) which was statistically significant. Group I showed significantly longer postoperative akinesia (2.52±0.51 hours) than group II (0.77±0.12 hours). Also the VAS scores were significantly lower at 1 hour in group I (2.94±0.54) when compared to group II (4.96±0.89). *Conclusion*: Ropivacaine and dexamethasone showed faster onset of akinesia but bupivacaine and dexamethasone showed prolonged postoperative akinesia, better postoperative analgesia and prolonged time to first recue analgesic.

Keywords: Bupivacaine; Ropivacaine; Dexamethasone; Peribulbar Block.

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Introduction

Ropivacaine is an amide local anaesthetic agent with wide margin of safety than bupivacaine for complications like cardiotoxicity and neurotoxicity [1]. The efficacy and the safety of ropivacaine for anaesthesia during cataract surgery is well studied abroad, with most of the studies using peribulbar technique and hyaluronidase to facilitate the onset of anaesthesia and akinesia.

Adding adjuvants to local anaesthetic agents in peribulbar block could be a method to prolong the duration of block. Dexamethasone is a highly potent, long acting glucocorticoid with less mineralocorticoid effect and it reduces the inflammation, edema, nausea, vomiting and the pain following the surgery [2,3].

Materials and Methods

Data Collection

Fifty (50) ASA physical status 1 and 2 patients undergoing small incision cataract surgery were included and power of study was 80% with 95%

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level of significance. After thorough pre anaesthetic evaluation, patients refusing consent, allergic to amide local anaesthetic or hyaluronidase, contraindication to steroids, patients with psychiatric illness and with one eye were excluded from the study.

Study Area

Department of Anaesthesiology, SSIMS & RC, Davangere.

Study Duration

Two (2) months (March-April 2018).

Procedure of Blocks

After the approval from institutional ethical committee and written informed consent from the patients, they were randomized to receive peribulbar anaesthesia using 0.5% bupivacaine, 2mg dexamethasone and hyaluronidase 50 IU/ml in group I (n=25) or 0.75% ropivacaine, 2mg dexamethasone and hyaluronidase 50 IU/ml in group II (n=25) using block randomization method. Standard monitoring was established and vitals were monitored.

The anaesthetic solution was prepared individually and immediately before the block. The investigators performing the injections and assessment were blinded to the solution used. Peribulbar local anaesthetic was given by using 25G, 1 inch needle at the junction of lateral 1/3rd and medial 2/3rd directed towards the orbital floor and the drug was injected until peribulbar fullness was observed or to a maximum volume of 7ml. Gentle massage was done over the globe for a minute so that the solution spreads uniformly.

Postoperatively, these patients were monitored for onset and duration of akinesia, VAS scores at 0, 1, 2, 3 hrs and time to first rescue analgesic required in the post anaesthesia care unit.

Statistical Analysis

Data collected was subjected to student's -t- test.

Results

In Table 1, akinesia was achieved slower (at 14.12±2.99 mins) in Group I when compared to (8.24±1.05 mins) Group II which was statistically significant (p<0.005).

Also, Group I shows longer postoperative akinesia (2.52±0.51 hours) than Group II (0.77±0.12 hours) which was also statistically significant (p<0.005).

Table 2 shows statistically significant (p<0.005), lower VAS scores at 1 hr in Group I (2.96±0.54) when compared to Group II (4.96±0.89).

Table 1: Showing Demographic Data, Akinesia And Post Op Akinesia

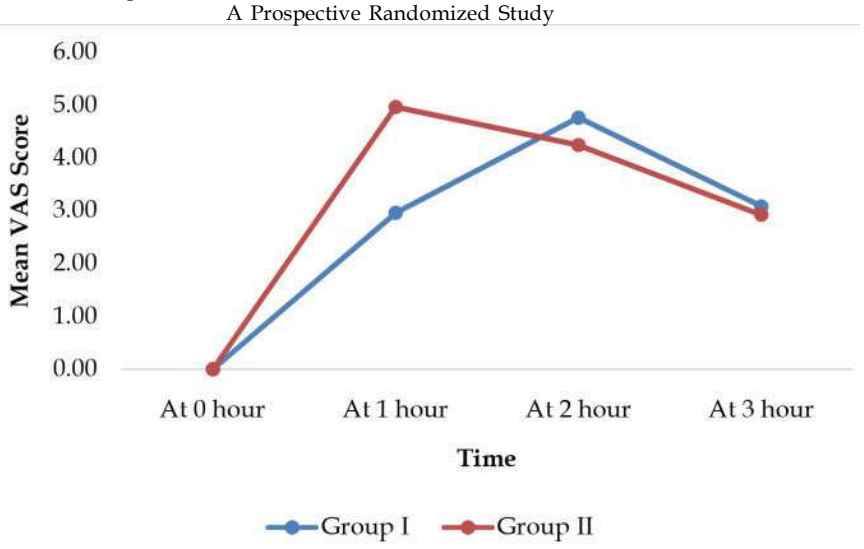
Variable	Group I	Group II	p value
Age	63.68±10.92	64.80±7.99	0.681
Gender (M/F)	14/11	10/15	0.258
Akinesia(mins)	14.12±2.99	8.24±1.05	0.000
Post op akinesia(hours)	2.52±0.51	0.77±0.12	0.000

Table 2: Comparing vas scores at various intervals

Variable	Group I	Group II	p value
At 0 hour	0.00±0.00	0.00±0.00	
At 1 hour	2.96±0.54	4.96±0.89	0.000
At 2 hour	4.76±0.66	4.24±0.72	0.061
At 3 hour	3.08±0.70	2.92±0.57	0.381

Table 3: Comparing time to first rescue analgesic

Variable	Group I	Group II	p value
First rescue analgesic in hours	2.04±0.35	1.08±0.28	0.000



Graph 1: A Graph Comparing Vas Scores at Different Time Intervals

Table 4 shows that first rescue analgesic was taken at a longer time period in Group I (2.04±0.35 hours) when compared to Group II (1.08±0.28 hours) which was statistically significant ($p<0.005$).

Discussion

The study conducted by us was a prospective, randomized study. Dexamethasone was not used as an adjuvant to local anaesthetic for ophthalmic block, but was used alone intravitreally, subconjunctival and peribulbar injection [4].

Steroids bind directly to the intracellular glucocorticoid receptor and their effects are predominantly mediated through altered gene protein transcription [5]. As dexamethasone requires 1-2 hours for its onset of action, it has no effect on the onset of akinesia in periblubar block [5].

Our study indicates that dexamethasone when added to bupivacaine for peribulbar block in cataract surgeries led to significantly prolonged duration of akinesia along with prolonged postoperative analgesia and the time to first rescue analgesic when compared to addition of dexamethasone to ropivacaine.

Parrington et al.[6] found that addition of dexamethasone to mepivacaine prolongs the duration of analgesia but does not reduce the onset of motor and sensory blockade after ultrasound guided supraclavicular block compared with mepivacaine alone.

In support of the direct effect of dexamethasone, Shrestha et al.[7] found that dexamethasone added to local anaesthetic prolongs postoperative analgesia significantly compared with Tramadol, when used as an admixture to local anaesthetic in brachial plexus block for upper extremity surgery.

Conclusion

We would conclude by our study that ropivacaine with dexamethasone showed faster onset of akinesia but bupivacaine with dexamethasone group showed prolonged postoperative akinesia, better postoperative analgesia and prolonged time to first rescue analgesic.

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