

A Comparative Evaluation of Efficacy of Different Local Anaesthetic Solutions in Patients Undergoing Peribulbar Anaesthesia at a Tertiary Care Teaching Hospital

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Article History

Received: 08 Feb 2016

Revised: 06 Mar 2016

Accepted: 21 Mar 2016

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ABSTRACT

Background: Peribulbar anaesthesia is often regarded as one of the safest regional anaesthesia for ophthalmic surgeries. Hence; we planned the present study to compare the efficacy of two different anaesthetic solutions in patients scheduled to undergo peribulbar anaesthesia.

Materials & Methods: The present study was planned to compare the efficacy of two different anaesthetic solutions in patients scheduled for peribulbar anaesthesia. A total of 40 patients who were scheduled to undergo extracapsular cataract extraction under local anaesthesia were enrolled in the present study. All the patients were randomly divided into two study groups as follows: Group L: Patients receiving 2 % Lignocaine, Group P: Patients receiving prilocaine 3% with felypressin. A four point scale was used for assessment of progress of block with 1 score indicating excellent operating condition, while 4 score indicating inadequate block for surgery. All the results were analysed by SPSS software.

Results: Mean volume used for block of group L and group P were 8.9 ml and 8.8 ml respectively. Mean pain score of subjects of group L was 6 while mean pain score of subjects of group P was 4. Time taken to reach a score of less than 4 (adequate for surgery) was 2.7 minutes and 2.8 minutes for group L and group P respectively.

Conclusion: Both the anaesthetic agents are equally effective in patients undergoing peribulbar anaesthesia.

KEYWORDS: Anaesthesia, Local Anaesthesia, Peribulbar.

INTRODUCTION

Peribulbar anaesthesia is often regarded as one of the safest regional anaesthesia for ophthalmic surgeries. Various anesthetic agents are available in ophthalmology for performing local anaesthesia procedures such as lidocaine, etidocaine and hyaluronidase, or lidocaine, bupivacaine and hyaluronidase, or lidocaine and bupivacaine without hyaluronidase, or more recently, mépivacaine or ropivacaine.¹⁻³

One of the common problems encountered while performing local anaesthesia is the Pain during injection and this is partly explained by the direct tissue irritation caused by injecting an acidic solution, Lidocaine

hydrochloride (L-HCL). The increase in relative concentration of the non-ionized form allows for a more rapid diffusion through the tissues and might result in almost immediate sensory nerve blockade.⁴⁻⁶

The nociceptor receptors are also less sensitive to the non-ionized form of the drug. Hence pain perceived is less during injection of either warmed or alkalinized solutions as they contain increased non-ionized fraction of the drug form.⁷ Hence; present study was conducted to compare the efficacy of two different anaesthetic solutions in patients scheduled to undergo peribulbar anaesthesia in Department of Anaesthesia, DS Medical College, Perambalur, Tamilnadu (India).

MATERIALS & METHODS

The present study was planned in the Department of Anaesthesia, Dhanalakshmi Srinivasan Medical College and Hospital, Siruvachur, Perambalur, Tamilnadu (India) to compare the efficacy of two different anaesthetic solutions in patients scheduled for peribulbar anaesthesia. We obtained written consent from all the patients before the starting of the study. A total of 40 patients who were scheduled to undergo extracapsular cataract extraction under local anaesthesia were enrolled in the present study. Exclusion criteria for the present study included:

- Patients with presence of any comorbid condition,
- Diabetic and hypertensive patients,
- Patients with any known drug allergy

All the patients were randomly divided into two study groups as follows:

Group L: Patients receiving 2 % Lignocaine,

Group P: Patients receiving prilocaine 3% with felypressin.

Preparation of all the anaesthetic solutions was done just prior to the study. Anaesthesia was administered by experienced and skilled anaesthetist. Visual analogue scale was used for evaluation of pain of injection. Following scale was used for evaluating the movement of eyes in all the four quadrants:

0 = absence of movement; 1 = reduction in movement; 2 = normal movement.

We recorded the sum of scores in each quadrant, along with time taken to achieve a score of less than 4.⁸ A four point scale was used for assessment of progress of block with 1 score indicating excellent operating condition, while 4 score indicating inadequate block for surgery. All the results were analysed by SPSS software. Student t test and chi- square test were used for assessment of level of significance.

RESULTS

In the present study, we enrolled a total of 40 subjects and divided them randomly and broadly into two study groups with 20 patients in each group. Mean age of the subjects of the group L was 69.5 years while mean age of the subjects of the group P were 70.2 years respectively. Mean volume used for block of group L and group P were 8.9 ml and 8.8 ml respectively. There were 12 males in group L while there were 14 males in group P. Mean pain score of subjects of group L was 6 while mean pain score of subjects of group P was 4. Time taken to reach a score of less than 4 (adequate for surgery) was 2.7 minutes and 2.8 minutes for group L and group P respectively.

Graph 1: Details of subjects of both the study groups

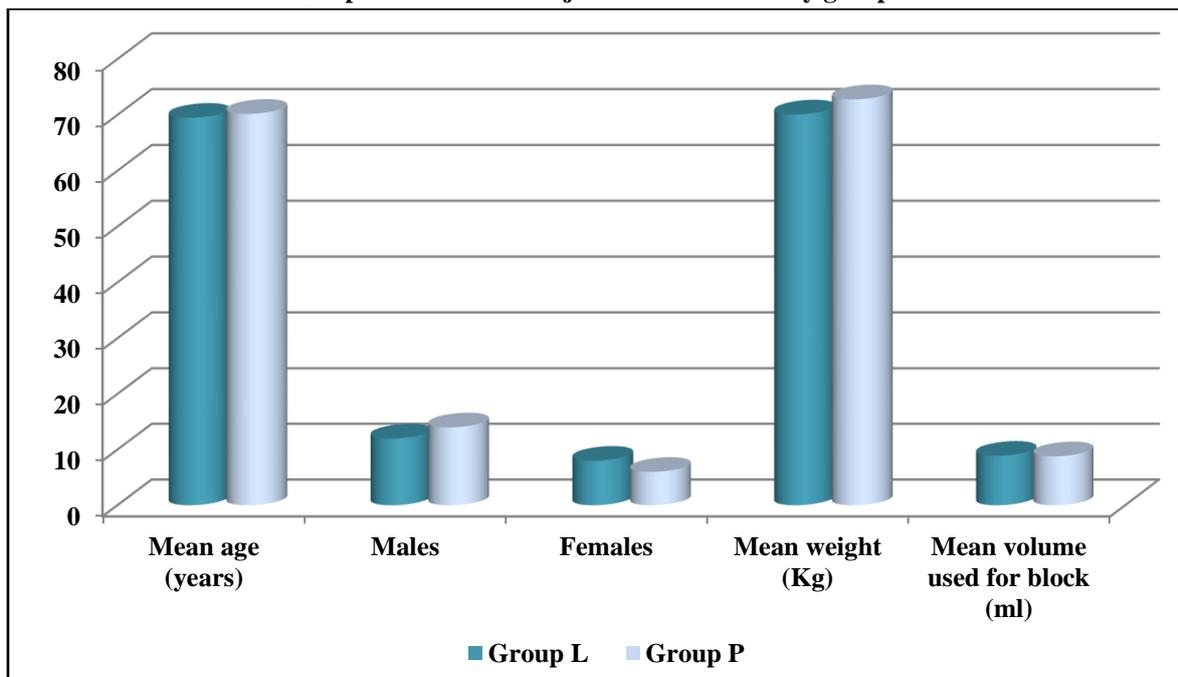


Table 1: Comparison of both the study groups

Parameter	Group L	Group P	P- value
Median pain score (VAS)	6	4	0.25
Time taken in minutes to reach a score of less than 4 (adequate for surgery)	2.7	2.8	

VAS: Visual analogue scale

DISCUSSION

In the present study, a total of 40 subjects were enrolled and were divided randomly and broadly into two study groups with 20 patients in each group. Mean volume used for block of group L and group P were 8.9 ml and 8.8 ml respectively. Mean pain score of subjects of group L was 6 while mean pain score of subjects of group P was 4. Time taken to reach a score of less than 4 (adequate for surgery) was 2.7 minutes and 2.8 minutes for group L and group P respectively. Bedi A et al compared three agents for peribulbar anaesthesia. Sixty patients undergoing extracapsular cataract extraction under local anaesthesia were randomly allocated to receive peribulbar anaesthesia with lignocaine 2% with adrenaline; prilocaine 3% with felypressin 0.03 IU.ml⁻¹ or 2% lignocaine and 0.5% bupivacaine in a ratio of 1:1, using a standardised two-injection technique. The pain of injection, time of onset of the block and the operating conditions at the start and finish of surgery were assessed. Peribulbar anaesthesia using lignocaine 2% was significantly more painful than the other solutions. The onset of anaesthesia adequate for surgery was similar in all three groups. Prilocaine 3% with felypressin was associated with the greatest number of blocks providing total akinesia of the eye. Inadequate duration of anaesthesia was seen in only one case; the solution used for this block was 2% lignocaine.⁸

Van den Berg AA et al studied 200 middle-aged to elderly patients undergoing cataract extraction to compare the efficacy of: (1) bupivacaine 0.5% (bup 0.5% plain); (2) bupivacaine 0.5% plus hyaluronidase 100 i.u. ml⁻¹ (bup 0.5% hyalase); (3) lidocaine 2% plus epinephrine 1:200 000 (lido 2% epi); or (4) a mixture of lidocaine 2% and bupivacaine 0.5% (2:3 volume per volume mix) containing hyaluronidase 25 i.u. ml⁻¹ (lido/bup/hyalase). A standardized deep peribulbar block technique, akinesia scoring system (each 5 minx4), and supplemental protocol was followed. Akinesia scores were similar after each agent at 5 min, better with lido 2% epi compared with bup 0.5% plain at 10 min, and better with bup 0.5% hyalase, lido 2% epi, and lido/bup/hyalase, than with bup 0.5% plain at 15 min and at 20 min. The supplementation rate at 5 min was least with lido 2% epi, greater with bup 0.5% plain and bup 0.5% hyalase and greatest with lido/bup/hyalase, but similar in each group at 10, 15 and 20 min. Overall, those given lido 2% epi required the least number of supplemental injections to achieve globe akinesia. All four agents provided adequate analgesia during cataract extraction lasting approximately 95-100 min after PBA injection.⁹ Gioia L et al evaluated the efficacy of three different concentrations of ropivacaine (0.5%, 0.75%, and 1%) together with a single concentration of hyaluronidase administered for peribulbar block. Patients were randomly allocated to receive peribulbar block with 6.5 mL of either 0.5% (Group Ropi-5; n =

22), 0.75% (Group Ropi-7.5; n = 22), or 1% ropivacaine (Group Ropi-10; n = 24). In all patients, 0.5 mL of hyaluronidase was added to the local anesthetic solution. Seven hours after surgery, a smaller proportion of Group Ropi-10 patients (64%) showed complete recovery of sensory function as compared with both Group Ropi-5 (94%) and Group Ropi-7.5 (90%; p = 0.03 and p = 0.03, respectively). Complete recovery of motor function 1 hour after surgery was more frequent in Group Ropi-5 (37%) than in Group Ropi-7.5 (5%) or Group Ropi-10 (9%; p = 0.05 and p = 0.05, respectively); however, no other differences in recovery of motor function were observed at any other observation times, with complete recovery in all patients 7 hours after surgery. While confirming that ropivacaine is a good option for peribulbar anesthesia, their study demonstrated that the use of 0.75% or 1% concentrations are preferred in that they produce quick and deep sensory and motor block of the operated eye.¹⁰

Ali-Melkkilä T et al compared two methods of periocular anaesthesia (PI and PII) with the traditional retrobulbar block in a prospective study of 450 patients undergoing elective cataract extraction and intraocular lens implantation. A solution of local anaesthetic containing equal amounts of 2% lignocaine and 0.5% bupivacaine was used in all the groups. Hyaluronidase (75 IU/10 ml of local anaesthetic solution) was added. Three groups of patients were studied, with 150 patients in each group. The retrobulbar injection (group R) was performed with 4 ml of the anaesthetic solution through the lower eyelid inferotemporally and a further 6 ml was injected for seventh cranial nerve block. In the first periocular technique (group PI) the local anaesthetic was injected inferotemporally (5 ml) through the lower lid and superonasally (5 ml) through the upper lid. In the second periocular technique (PII) the injections were performed inferotemporally (5 ml) and into the medial compartment (2 ml) of the orbit at the medial canthus. Satisfactory anaesthesia could be achieved with all of these methods. Additional block because of insufficient akinesia of the muscles was required in 12% (18/150) in group R, in 19% (28/150) in group PI, and in 11% (16/150) in PII. The medial compartment technique (PII) was associated with the highest percentage of total akinesia of the muscles and lowest reblock rate. All three methods produced sufficient analgesia during surgery and there were no differences in the requirements for additional analgesic drugs during surgery. It was concluded that the medial compartment technique represents a good alternative to retrobulbar block.¹¹

CONCLUSION

Under the light of above obtained data, the authors conclude that both the anaesthetic agents are equally effective in patients undergoing peribulbar anaesthesia. However; further studies are recommended.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Shishir Ramachandra Sonkusale, Rajul Subhash Karmakar. A Comparative Evaluation of Efficacy of Different Local Anaesthetic Solutions in Patients Undergoing Peribulbar Anaesthesia at a Tertiary Care Teaching Hospital. *Int J Med Res Prof*. 2016, 2(2); 384-87.