Original Research Paper

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Anaesthesiology

COMPARATIVE STUDY OF THE EFFECTS OF 0.5% ROPIVACAINE AND 0.5% LEVOBUPIVACAINE IN ULTRASOUND GUIDED BRACHIAL PLEXUS BLOCK IN PATIENTS UNDERGOING UPPER LIMB SURGERIES - A PROSPECTIVE RANDOMISED DOUBLE BLINDED STUDY

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KEYWORDS :

INTRODUCTION

Peripheral nerve blocks are widely popular now due to the advantages that regional anaesthesia has over general anaesthesia. Peripheral nerve blocks are widely accepted as the standard of anaesthesia or analgesia for ambulatory limb surgeries. Regional anaesthesia have been found to be most effect in high risk patients, especially patients in the elderly age group undergoing surgeries involving upper or lower extremities. Patients with comorbidities such as cardiovascular diseases, chronic lung disease, metabolic diseases, neuropathies and/or immunosuppressive states, when undergoing general anaesthesia, face challenges like changes in haemodynamic stress response and potential for drug interaction due to polypharmacy. These patients would benefit from regional anaesthesia, especially for ambulatory limb surgeries. Regional anaesthesia can be a good alternative to general anaesthesia with the advent of accessories such as peripheral nerve stimulator and ultrasound. All the disadvantages of a block by a blind technique have been overcome with nerve stimulation and ultrasound guidance. The added advantages of visualization of the nerve plexus have helped in administration of the drug with more precision, obtaining better quality of the nerve block, shortening the latency and minimizing the amount of drug needed for the block. It has also resulted in decreased complications such as vessel puncture and injury to pleura. . Combining nerve stimulator and ultrasound proved to be more accurate and reliable. Ultrasound guided nerve blocks provided visual guidance to needle position and, hence, more successful and safer blocks. Newer local anaesthetics with minimal cardiovascular effects and longer duration of action have been developed.

AIM:

To study the effect of 0.5% Ropivacaine and 0.5% Levobupivacaine in supraclavicular brachial plexus block in patients undergoing upper limb surgeries.

OBJECTIVES:

1. Primary Objective: To compare the onset of motor and sensory blockade of 0.5% Levobupivacaine and 0.5% Ropivacaine.
2. Secondary Objective: To compare the duration of post-operative analgesia of 0.5% Levobupivacaine with 0.5% Ropivacaine

METHODS:

1) Patients aged 18-70 years scheduled for upper limb surgeries
2) ASA 1-2 Patients

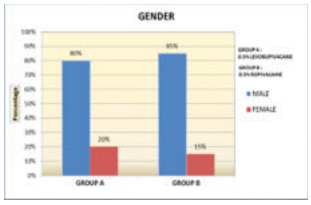
This is a prospective study of FORTY surgically treated patients at our institution conducted from June 2020 to June 2022

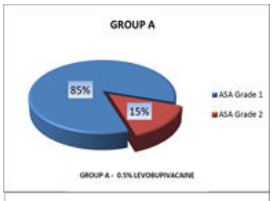
STATISTICS

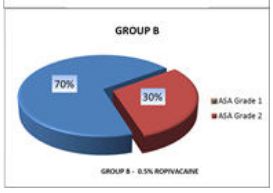
Statistical Analysis The data was analysed using the software SPSS 16.0. The mean and standard deviation was used to describe the outcome measures such as sensory block duration, visual numerical rating scale and postoperative analgesia. The statistical significance between the two groups was analysed using independent samples t test. For non-normal data alternate descriptive statistics such as median was used to describe the observations and the non-parametric test - Mann Whitney U test - was used for testing the significant difference between the two groups. The results were presented using error plots, box plots and histogram plots also. Chi-square test with continuity correction was used to test the significant difference in distribution of treatments among the different categories of age, gender and ASA grades.

RESULTS

A total of 40 patients were recruited in this study between September 2020 and February 2022, with 20 patients in each Group. Group A received 0.5% Levobupivacaine and Group B received 0.5 % Ropivacaine by means of ultrasound guided supraclavicular nerve block.





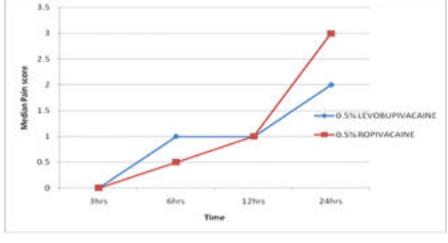


ASA

VARIABLES	GROUP A 0.5% LEVOBUPIVACAINE		GROUP B 0.5% ROPIVACAINE		p value
	Median	ICR (q1-q3)	Median	ICR*	
Time of onset of sensory block (minutes)	10	10 - 15	10	5 - 10	0.123
Time of onset of motor block (minutes)	10	5 - 15	15	5 - 18.75	0.310
Duration of post-op analgesia (minutes)	745	510 - 1420	735	551.25 - 1548.75	0.588

Sub Analysis

a) Comparison of post-op VAS score between Group A (0.5% Levobupivacaine) and Group B (0.5% Ropivacaine) patients.



Trend of Post-Operative VAS score of Group A and Group B patients

The above line graph depicts the trend in post-operative VAS score between Group A (0.5% Levobupivacaine) and Group B (0.5% Ropivacaine) patients over a period of 24 hours. Patients in Group A have a rapid increase in pain scores at 12 hours postoperatively. At the end of 24 hours Group A patients have a median pain score of 2 while Group B patient.

DISCUSSION

It appears that demographic data such as age, sex, patient weight and

ASA grade, diagnoses and surgery duration are equally distributed between the two groups of 20 patients each and are, hence, comparable.

In our study, the primary objective was to compare the onset of motor and sensory blockade between Group B (0.5% Ropivacaine) and Group A (0.5% Levobupivacaine) patients. In Group A and Group B patients the median time for onset of sensory blockade was found to be 10 minutes. The median time for onset of motor blockade in Group A was 10 minutes and Group B was 15 minutes. This difference was found to be not significant at the 5% significance level ('P value' of 0.123 for time of onset of sensory blockade and 'P value' of 0.310 for time of onset of motor blockade).

The secondary objective was to compare the duration of post-operative analgesia between Group A and Group B patients. In Group A patients, the median duration of post-operative analgesia was 745 minutes which is slightly longer than Group B patients whose median value was 735 minutes. However this difference was found to be not significant at the 5% significance level as 'P value' is 0.588.

In sub-analysis, comparing the VAS score between two groups, it was found that the median pain scores in Group A (0.5% Levobupivacaine) was two (2) while that in Group B (0.5% Ropivacaine) was three (3).

In a similar study conducted by LT Erike cline et al, it was found that the duration of sensory analgesia was longer in the Levobupivacaine group (831 minutes) than in the Ropivacaine group (642 minutes) with a 'P value' of 0.013. This difference was probably due to the fact that they had used higher volume (40 ml of 0.5% Levobupivacaine and 40 ml of 0.5% Ropivacaine) of local anaesthetics and also had added additives to prolong the action (1 : 200000 of epinephrine).The technique used in their study was 'axillary brachial plexus block'.

CONCLUSION

In our study, the onset of sensory and motor blockade and the duration of postoperative analgesia between 0.5% Ropivacaine and 0.5% Levobupivacaine were comparable.