



A COMPARITIVE STUDY OF BUPIVACAINE 0.5% AND ROPIVACAINE 0.5% FOR SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK"

Medical Science

Dr Seema Sharma

ABSTRACT

OBJECTIVES Supraclavicular Brachial plexus block provides safe, effective, low cost anaesthesia with excellent post operative analgesia. The current study was an attempt to compare Bupivacaine 0.5% with Ropivacaine 0.5% in supraclavicular brachial plexus block with respect to Onset time and Duration of Sensory blockade, Duration of Analgesia, Side effects. **METHODS** Each patient was randomly allocated to one of the two groups of 30 patients each.

Group B – i.e Bupivacaine group receives 30 ml Bupivacaine 0.5% (5 mg/ml)

Group R – i.e Ropivacaine group receives 30 ml Ropivacaine 0.5% (5 mg/ml)

RESULTS Onset of Sensory and Motor block We observed that onset of sensory block was earlier in Bupivacaine group (Group B) having a mean value 17.70 ± 2.35 minutes in comparison with ropivacaine group (Group R) having a mean value of 22.13 ± 3.05 minutes. onset of Motor block was earlier in Bupivacaine group (Group B) having a mean value of 25.43 ± 2.22 minutes in comparison with ropivacaine group (Group R) having a mean value of 27.90 ± 1.88 minutes which is statistically significant. **Duration of Sensory and Motor block** The Duration of sensory block was 342.00 ± 47.66 minutes with Bupivacaine group (Group B) and 302.00 ± 42.38 minutes with Ropivacaine group (Group R). The duration of sensory block was longer in Bupivacaine group compared with Ropivacaine group. The Duration of Motor block was 369.00 ± 41.05 minutes with Bupivacaine group (Group B) and 336.00 ± 37.29 minutes with Ropivacaine group (Group R). The duration of Motor block was longer in Bupivacaine group compared with ropivacaine group, which is statistically significant. **Duration of Analgesia** The Duration of Analgesia was 372.00 ± 42.86 minutes with Bupivacaine group (Group B) and 341.00 ± 36.52 minutes with Ropivacaine group (Group R). The duration of Analgesia was longer in Bupivacaine group compared with Ropivacaine group, which is statistically significant. **CONCLUSION** Bupivacaine 0.5% has Early onset of Sensory blockade, Early onset of Motor blockade, Prolonged Duration of Sensory blockade, Prolonged Duration of Motor blockade, Prolonged Duration of Analgesia when compared to Ropivacaine 0.5% at equal volumes.

KEYWORDS

Brachial block; Bupivacaine ; Ropivacaine

INTRODUCTION

Peripheral nerve blocks have become important in clinical practice because of their role in post operative pain relief, shortening of patient recovery time & avoiding risks and adverse effects of General anaesthesia. Hence, peripheral nerve blockade is now a well accepted concept for comprehensive anaesthetic care.

For upper limb Surgeries, Brachial plexus block is the preferred Regional anaesthesia technique. Bupivacaine is a long acting local anaesthetic. Due to its long duration of action and combined with its high quality sensory blockade compared to motor blockade it has been the most commonly used local anaesthetic for peripheral nerve blocks.

Ropivacaine is a newer, long acting local anaesthetic whose neuronal blocking potential it has significantly greater safety margin over Bupivacaine because of lower CNS and Cardiac toxicity and hence can be used in higher concentrations. One of the drawbacks of Ropivacaine mentioned is its less intense motor blockade compared to Bupivacaine.

Hence here is an attempt through the study to compare Bupivacaine with Ropivacaine in supraclavicular brachial plexus block.

OBJECTIVES

The present study was a prospective study compare the effect of Bupivacaine 0.5% & Ropivacaine 0.5% used for Supraclavicular approach to brachial plexus block with respect to

- Onset time of Sensory blockade
- Onset time of Motor blockade
- Duration of Sensory blockade
- Duration of Motor blockade
- Duration of Analgesia
- Side effects/ Complications

Materials and Methods

Study design – Comparative randomized study.

Sample size – Two groups of 30 each.

Sampling method – Simple random sampling.

Statistical analysis – Student's t-test.

METHOD OF COLLECTION OF DATA

Sixty patients aged between 18 years and 60 years, of physical status

ASA grade 1 and ASA grade 2 undergoing elective upper limb surgeries lasting more than 30 minutes were included in the study after getting ethical clearance.

Inclusion criteria – patients aged between 18 years to 60 years under physical status ASA grade 1 and ASA grade 2, of weight 50 kg to 80 kg scheduled for elective upper limb surgeries after obtaining written informed consent from patient/ patient attenders.

Exclusion criteria – Known allergy to local anaesthetics, Patient's refusal, History of Cardiovascular disorders, Neuromuscular disorders, Bleeding disorders or patient on Anticoagulant therapy, Hepatic failure, Renal failure, pregnancy, Brachial plexus injury, Local infections.

Group B – i.e Bupivacaine group receives 30 ml Bupivacaine 0.5% (5 mg/ml)

Group R – i.e Ropivacaine group receives 30 ml Ropivacaine 0.5% (5 mg/ml)

Procedure – Intravenous access obtained in the limb opposite to that undergoing surgery. All monitors attached. blood pressure and HR recorded at interval of 5 minute in the first 30 minutes and every 30 minutes thereafter. Patient was placed in supine position with the head turned away from the side to be blocked. Supraclavicular area aseptically prepared and draped. An intradermal wheal raised about 1 cm above the midclavicular point. Subclavian artery palpable in supraclavicular fossa used as landmark. A 23 gauge needle inserted behind the artery in backward-inward downward direction till paresthesia in the forearm elicited. After negative aspiration for blood, 30 ml of respective drug was injected depending on whether patient is allotted to either of group B or R.

ASSESSMENT OF SENSORY BLOCK

Sensory block was assessed by pin prick with 23g hypodermic needle in skin dermatomes c4-t2 once in every minute for initial 30 minutes and then after every 30 minutes till patient regained normal sensations and graded according to Visual analogue scale (VAS) as

- 0-No Pain
- 2-Annoying (Mild pain)
- 4-Uncomfortable (Moderate pain)
- 6-Dreadful (Severe pain)

8-Horrible (Very severe pain)
10-Agonizing (Worst possible pain)

ASSESSMENT OF MOTOR BLOCK

Quality of motor block was assessed at the same intervals and graded according to Modified Lovett's Scoring as

Grade 6- Normal
Grade 5 –slightly reduced muscular force
Grade 4 – pronounced reduction.
Grade 3 –slightly impaired mobility.
Grade 2 – pronounced mobility impairment.
Grade 1 –Almost complete paralysis
Grade 0 – Complete paralysis.
The effect on the following parameters were observed :

RESULTS

The present study was conducted on 60 consenting patients aged between 18-60 years. Group B received 30ml of 0.5% Bupivacaine .Group R received 30ml of 0.5% Ropivacaine for Brachial plexus block by supraclavicular approach .

TABLE : COMPARISON OF GROUP B AND GROUP R ON THE BASIS OF ONSET TIME OF SENSORY AND MOTOR BLOCKADE.

Study variables	Group B	Group R	P value
SENSORY ONSET TIME	17.70±2.35	22.13±3.05	<0.001
MOTOR ONSET TIME	25.43±2.22	27.90±1.88	<0.001

Comparison of Mean Onset Time between the groups

Onset time of Sensory and Motor blockade was earlier in Group B when compared with Group R . The p value was < 0.001 which is statistically very highly significant .

Table : COMPARISON OF GROUP B AND GROUP R ON THE BASIS OF DURATION OF SENSORY AND MOTOR BLOCKADE.

Study variables	Group B	Group R	P value
DURATION OF SENSORY BLOCKADE	342.00±47.66	302.00±42.38	0.001
DURATION OF MOTOR BLOCKADE	369.00±41.05	336.00±37.29	0.002

Duration of Sensory and Motor blockade was prolonged in Group B when compared with Group R . The p value was 0.001 and 0.002 respectively which is statistically very highly significant .

TABLE : COMPARISON OF GROUP B AND GROUP R ON THE BASIS OF DURATION OF ANALGESIA

Study variables	Group B	Group R	P value
DURATION OF ANALGESIA	372.00±42.86	341.00±36.52	0.004

Duration of Analgesia was prolonged in Group B when compared with Group R .

The p value was 0.004 which is statistically very highly significant.

The patients in our study groups did not vary much with respect to Age , Sex , Height or Weight.

There was no significant differences between the study groups with respect to pattern of changes in Heart rate, Systolic blood pressure , Diastolic blood pressure , Mean arterial pressure perioperatively.

CONCLUSION

On the basis of our study, we can draw the conclusion that at equal volumes Bupivacaine 0.5% has an advantage over Ropivacaine 0.5% for Supraclavicular Brachial Plexus block in terms of

- Early onset of Sensory blockade .
- Early onset of Motor blockade .
- Prolonged Duration of Sensory blockade .
- Prolonged Duration of Motor blockade .

Prolonged Duration of Analgesia .

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