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Original Article

Supraclavicular brachial plexus block with 0.75 % ropivaciane and with additives tramadol, fentanyl- a comparative pilot study.

Ravi Madhusudhana*, Krishna Kumar , Ramesh Kumar , Somasekharam Potli, Dinesh Karthik, Manu Kapil.

Associate Professor, Department Of Anaesthesiology and Intensive care, Sri Devaraj Urs Medical college, Kolar, Karnataka.

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ABSTRACT

Background Ropivacaine is a long acting regional anaesthetic that is structurally related to Bupivacaine but less toxic than bupivacaine. The efficacy of ropivacaine may be altered with co administration of opiod additives like Tramadol, Fentanyl in terms of duration of postoperative analgesia. Objectives: To determine and compare efficacy of supraclavicular block of brachial plexus with ropivacaine, ropivacaine and tramadol, ropivacaine and fentanyl in terms of onset, quality and duration of sensory and motor block for patients undergoing surgery for the upper limb. Methodology: After Informed consent, with standard precautions to avoid complications, total of 30 patients ,10 for each group, age group ranging between 18 to 60years, ASA 1&2 category posted for upper limb surgery were selected. Group 1 received inj Ropivacaine 0.75% 30ml, Group 2 received inj Ropivacaine 0.75% 29 ml with inj Tramadol 50 mg(1 ml), and Group 3 received inj Ropivacaine 0.75% 29 ml with inj Fentanyl 50 mcg(1 ml). The Exclusion Criteria was history of any hypersensitivity to ropivacaine, hemodynamic instability, arrhythmias on treatment, local infection/inflammation and Patient refusal Blinding and randomization done.The onset, quality and duration of Sensory and Motor block with plain ropivacaine, and with additives Fentanyl, Tramadol was compared. The data collected statistically analyzed. Results: There was a significant difference between group 1 and 3 for duration of sensory & motor block, VAS score at the p = 0.0001 . Also there was a significant difference between group 2 and 3 for duration of sensory & motor block at p=0.0001 and VAS score at the p value of 0.001 . Conclusion: The addition of opiods to local anaesthetics in our study showed that there is significant beneficial effects on duration of sensory , motor blockade and VAS scores compared to plain ropivacaine alone.

1. Introduction

Supraclavicular Brachial plexus block is preferred for its rapid onset, reliable anesthesia and as a safe technique for any surgery in the upper extremity that does not involve the shoulder. Several studies have suggested that the addition of certain opiates to the local anaesthetics used for brachial block may provide effective, long-lasting postoperative analgesia. [1] Ropivacaine, the S-(-)-enantiomer of N-(2,6-dimethylphenyl)-1-propyl-2 piperidinecarboxamide is a new long-acting local anesthetic. It has been reported to be less toxic than bupivacaine but more toxic than lidocaine.[2]

2.Material and Methods

The study was conducted after Informed consent, standard precautions taken to avoid complications.A total of 30 patients ,10 for each group, age group ranging between 18 to 60years, ASA 1&2 category posted for upper limb surgery were selected. Group 1 received inj Ropivacaine 0.75% 30ml, Group 2 received inj Ropivacaine 0.75% 29 ml with inj Tramadol 50 mg(1 ml), and Group 3 received inj Ropivacaine 0.75% 29 ml with inj Fentanyl 50 mcg(1 ml).

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* Corresponding Author : Ravi Madhusudhana
65/85,11 th cross, R.R.Temple Street,
J.C.Layout,Devasandra, K.R.Puram,
Bangalore:560036
E.mail: ravijaggu@hotmail.com

The Exclusion Criteria was history of any hypersensitivity to ropivacaine, hemodynamic instability, arrhythmias on treatment, local infection/inflammation and Patient refusal. Blinding done by using similar syringes , dose was standardized to 1ml as additive medication which was loaded by another person who was not giving the block, and the selection of the patient was by Random number table generated by computer.

The onset, quality and duration of Sensory and Motor block with plain ropivacaine, and with additives Fentanyl, Tramadol was compared. The data collected statistically analyzed. After connecting and recording Heart rate, Blood pressure ,saturation and ECG, Intravenous access was established with a wide bore cannula. Patient was explained about the procedure , positioned with a small pillow under the neck and face turned to opposite side. With aseptic precautions supraclavicular brachial plexus block performed with eliciting paraesthesia and injection of the medication.

The time of onset of sensory (pin prick) and motor block (inability to lift the hand) was noted, it was noted as complete or incomplete. The duration of sensory and motor blockade was recorded. The pain scores at recovery of sensation, was noted by asking the patient to point on Numerical pain scale (0-10). Rescue analgesia was given on demand, inj.Tramadol 50 mg i.v.Side effects if any were recorded. Heart rate, Blood pressure, Saturation and ECG were monitored through out the procedure. The results obtained were analysed by caluculating the mean, SD and Anova.

3. Results

The age, sex, weight, height and the procedures were comparable in between groups with a male predominance in cases. The types of cases were predominantly open reduction and fixation of fracture both bones forer arm, followed by implant removal and closed reductions forearm bones.

The onset time of sensory and motor blockade was not significant in between groups, average time for sensory block was 5 minutes and motor block was 14 minutes. The duration of sensory (9 hrs) and motor block (8 hrs) was significant with additive groups when compared to control group (6 hrs sensory, 5 hrs motor). VAS scores at recovery was slightly better in additive groups (4-5) compared to control group (5-6).

Adverse effects observed was hypotension in 2 cases of additive groups which was treated with i.v fluids. The haemodynamic parameters and saturation was within normal limits in all the groups except for 2 cases of hypotension as mentioned above.

Table 1 Demographic data

Parameters	Group 1 Mean ± SD	Group 2 Mean ± SD	Group 3 Mean ± SD	ANOVA
Age yrs	46.2 ± 13.65	35.6 ± 10.2	32.2 ± 9.99	0.028*
Wt (kgs)	62.3 ± 6.78	59.7 ± 8.57	63.9 ± 10.77	0.571

There was a significant difference between gp 1 and gp 3 p=0.032.

Table 2 sensory and motor blockade onset and duration of action of the drugs

Para-meters	Group 1 Mean ± SD	Group 2 Mean ± SD	Group 3 Mean ± SD	ANOVA
Onset sensory (min)	5 ± 0	5 ± 0	5 ± 0	NS
Onset motor (min)	11 ± 2.10	11.5 ± 2.41	11.5 ± 2.41	0.0857
Duration sensory (hrs)	9.7 ± 1.94	9.3 ±1.25	6.2 ± 0.78	0.0001**
Duration motor (hrs)	8.3 ±1.76	8.3 ± 1.25	5.2 ± 0.78	0.0001**
Rescue analgesia (hrs)	10.7 ± 1.94	10.3 ±1.25	7.2 ± 0.78	0.0001**
VAS at recovery	4.4 ± 0.51	4.6 ± 0.69	5.8 ± 0.78	0.0001**

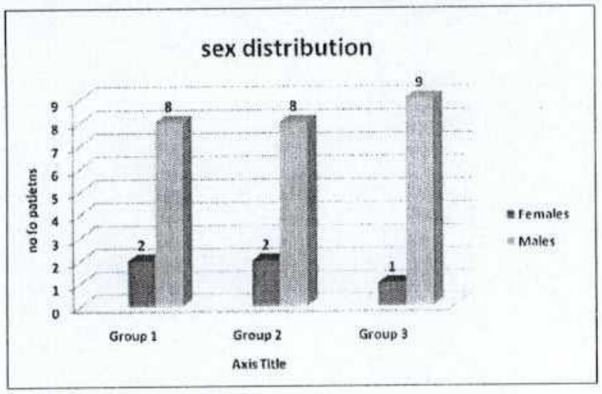
There was a significant difference between group 1 and 3 for duration of sensory & motor block , VAS score at the p = 0.0001 . Also there was a significant difference between group 2 and 3 for duration of sensory & motor block at p=0.0001 and VAS score at the p value of 0.001 . The adverse effect was hypotension at 10 min for gp 1and 3 and at 15 min for gp 2.

Table 3 Hemodynamic parameters

Para-meters	Group 1 Mean ± SD	Group 2 Mean ± SD	Group 3 Mean ± SD	ANOVA
Heart rate min	68.4 ± 8.78	70.4 ± 8.98	70 ± 7.48	0.855
Systolic BP	119.8 ± 11.25	115.2 ± 15.78	111.4 ± 7.94	0.314
Diastolic BP	78.8 ± 3.15	79 ± 3.16	77.2 ± 5.18	0.543

No significant difference was seen between the three groups for heart rate, systolic and diastolic blood pressure. This indicates that the ropivaciane alone, with tramadol and fentanyl has no effects on the heart rate and Blood pressure.

Figure 1. Majority of patients in each groups were males.



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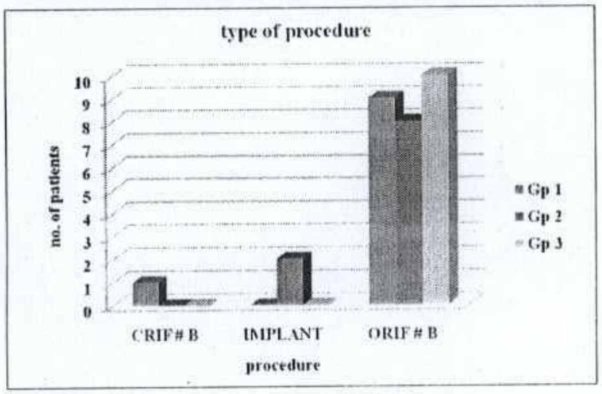

4.Discussion

Though there are different approaches to brachial plexus blocks, supraclavicular approach is preferred for surgeries involving forearm surgeries and even axillary approach also suffices.

Unlike bupivaciane which is a racemate, ropivacaine is a pure S-enantiomer developed for the purposes of reducing the potential toxicity and improving the relative sensory and motor block profiles.

Additives like clonidine, opiates have been tried to enhance the duration of sensory block and provide additive effect to local anaesthetics.

Addition of 100 µg fentanyl to 0.25% bupivacaine almost doubled the duration of analgesia with axillary brachial plexus block when compared with 0.25% bupivacaine alone.[3]

Addition of opiods did increase the duration of analgesia by a study by Bazin etal.[4]

In a review by Damien B. Murphy etal ,few studies showed a beneficial effect with additives and few did not show positive effects. Mechanism of opioids administered in to the brachial plexus is unknown, they may activate peripheral receptors or have a peripheral effect at other sites.[5]

In our study it supports the findings of the above studies in terms of duration of post operative analgesia and VAS scores.

5.Conclusion

We found that adding of opiates to ropivacaine did have an additive effect in terms of duration post operative analgesia.

6.References

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