Original article

A STUDY Of INJECTABLE LEVOBUPIVACAINE WITH NJECTABLE TRAMADOL IN SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK"

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INTRODUCTION:

- Pain is a personal and subjective experience that involves sensory, emotional and behavioral factors associated with actual or potential tissue injury as defined by the International Association for the Study of Pain.[1] . Pain has also been included as the "fifth vital sign" by the Joint Commission on Accreditation of Healthcare Organizations, thereby consideration of the pain in the care of the patients as well as discharge decision,[2] is of utmost importance.
- Anaesthesia for upper limb surgeries can be given by supra clavicular brachial plexus block with use of various local anaesthetic agents with adjuvant.
- These nerve blocks can be given by various methods such as conventional methods by anatomical landmark with use of peripheral nerve block or by using USG machine.
- As LEVOBUPIVACAINE is a local anaesthetic drug belonging to the amino amide group.it is the s-enantiomer of bupivacaine [(s)- 1 butyl-N-(2,6 – dimethylphenyl-piperidine-2-carboxamide].[18]
- Compared to bupivacaine , levobupivacaine demonstrated less affinity and strength of depressant effects into myocardial and central nervous vital centres in pharmacodynamic studies. And it has longer onset and duration time of motor block.[17]
- Tramadol, a 4 phenyl-piperidine analog of codeine has been found to have a unique mechanism of action that suggests its efficacy as an adjunct to local anesthetics in brachial plexus block.[10][11]

MATERIAL AND METHODOLOGY :

- After approval by Institutional Ethical Committee, this study

was carried out on 104 American Society of Anesthesiologists

(ASA) I/II patients of either gender, in the age group of 20-60

years over a period of 6 month, having fractures of forearm bones

for open reduction and internal fixation under supraclavicular

brachial plexus block.

- Patient's refusal for block, having bleeding disorders, getting opioid analgesics or monoamine oxidase inhibitors prior to surgery, local infections at the site where needle for block is to be inserted, history of seizures, respiratory or cardiac diseases, pregnancy were the exclusion criteria. Patients in whom the block effect was partial and required supplementary anaesthesia also were excluded.
- Randomization was achieved by computer generated random number table. Random group assigned was enclosed in a sealed opaque envelope to ensure concealment of allocation sequence. After shifting the patient inside operation theatre, sealed envelope was opened by anaesthesiologist not involved in the study to prepare the drug solution for infusion According to randomization. The observer who collected the intra-operative data as well as the operating surgeon were blinded to the drug solution administered.
- Observation type of study for 60 pts who is posted for upper limb surgery under supraclavicular brachial plexus block at this tertiery care centre.

- Randomly divided in to 2 groups:
- GROUP B – 30 pts
- GROUP M _ 30 pts.

- After routine pre-op profile & other investigation sos, will give routine pre medication in form of
- Inj.ondensetron 4mg(iv)
- Inj.glycopyrolate 0.04mg/kg(iv)
- Inj.midazolam 0.2mg/kg(iv).

- On arrival to the operation theatre, standard monitoring was established with starting of peripheral intravenous (I.V.) line by 18G cannula in the contralateral hand and ringer lactate infusion was started. After proper positioning of the patient and under all aseptic precautions supraclavicular brachial plexus block was performed by blinded anesthesiologist using subclavian artery as a guide, till paresthesia elicited or sensation of piercing the sheath felt.

- In GROUP B – 30 ml (0.5%) inj. Levobupivacaine + inj. Tramadol (1.5mg/kg)2ml In supra clavicular block.
- In GROUP M _ 30 ml(0.5%) inj. Levobupivacaine + inj. NS (2ml) in supraclavicular block +inj. Tramadol (1.5mg/kg)IM in supragluteal region.

- All above procedures are done with help of PNS machine or portable USG machine guided.
- Intra operative all anaesthetic monitoring care taken and observed for onset time, density (grade) , duration of block, & post operative analgesic requirement by VAS score.

- Routine monitoring of all the patients including blood pressure, pulse rate, SpO2, electrocardiogram was done.
- We evaluated onset, quality and duration of sensory and motor block. For sensory loss assessment, we used pin prick test with a three-point scale-0- no block, 1-analgesia (loss of sensation to pinprick), 2-loss of touch.
- Motor block was assessed by modified Bromage scale[10] for upper extremities using a 3 point scale. 0-total movement of fingers and wrist, 1-decreased motor strength with ability to move the fingers only, 2-inability to move fingers.

- Block was evaluated every 5 min till complete motor and

  sensory block after the injection of local anaesthetic. Further

  block assessment was done at hourly intervals up to 24 h by

  a blinded anaesthesiologist.

- Onset of sensory blockade was defined as the interval between the end of injection and sensory blockade and was demonstrated as loss of sensation to pinprick or by score 1 of pinprick response.
- Onset of motor blockade was the interval between the end of injection and complete motor paralysis of wrist and hand. The duration of sensory blockade being the time interval between sensory blockade and reappearance of pinprick response.
- The duration of motor blockade was defined as the time interval between maximum motor blockade and complete movement of wrist and fingers. Duration of analgesia was taken as the time interval between onset of sensory blockade and the first dose of rescue analgesic given to the patient.

OBJECTIVE AND RATIONALE

- To study the addition of inj. Tramadol (1.5mg /kg) as adjuvant with inj. Levobupivacaine 0.5% (30ml) in supra clavicular brachial plexus ,in form of

1) Onset Time for sensory and motor blockade

2) Duration time for sensory and motor blockade

3) Density of sensory and motor blockade &

4) evaluation of perineural inj. Tramadol on peripheral nerve tissue block.

INCLUSION & EXCLSION CRITERIA FOR ENTRY OF PARTICIPANTS :

- INCLUSION CRITERIA : ASA -1, ASA- 2, ASA -3, AGE GROUP 20 YRS TO 60 YRS.
- EXCLUSION CRITERIA : ASA -4 ,contraindicated to regional anaesthesia ,contraindicated to psychiatric pts , AGE GROUP <20 YRS & >60 YRS.

STATISTICAL RESULTS :

The data was analyzed by package SPSS 15.0 (SPSS Inc. Chicago, IL, USA). Demographic and hemodynamic data were analyzed by **Student's t-test.** For statistical analysis of onset time and duration of sensory and motor blocks, duration of analgesia, **unpaired t-test** was applied. $P < 0.05$ was considered as statistically significant. For intra-group analysis, a repeated measure **ANOVA** was performed .

TABLE : 1 : **DEMOGRAPHIC PROFILE :**

Parameters	**Groups (mean ±SD)**	
	Group B (n = 30)	**Group M (n = 30)**
Age (years)	35.50 ±1.233	35.33 ±1.25
Weight (kg)	54.03 ±8.134	54.46 ±7.74
Mean duration of surgery (min)	624.33 ±32.89	619.33 ±36.09

P <0.05 = significant , SD = standard deviation .

TABLE : 2 : COMPARISION OF MEAN DURATION OF ONSET OF SENSORY BLOCK IN 2 DIFF. GROUPS.

Study group	Mean duration of onset of sensory block(min) Mean±SD	P value
Group B	20.66±4.39	0.006
Group M	17.10±5.33	

TABLE :3: COMPARISION OF MEAN DURATION OF ONSET OF MOTOR BLOCK IN 2 DIFF. GROUPS.

Study group	Mean duration of onset of motor block(min) Mean±SD	P value
Group B	12.53±4.49	0.007
Group M	12.86±5.08	

Total number of patients enrolled during study period were 75, being 4O , 35 in groups B , M respectively. The number of patients who had partial blocks or failed blocks was 10 in Group A, 5 in Group B. After excluding these patients, the total number of patients taken for study was 30 in each group. The TWO groups were comparable to each other with respect to age, gender, weight and duration of surgery [Table 1].

It was found that onset of sensory block was faster in Group M (17.10±5.33) than Group B (20.66±4.39) (P = 0.06) [Table 2]. But The onset of motor block was faster in Group B (12.53±4.49) than Group M (12.86±5.08) (p = 0.007) [Table 3].

Acc.to our study , we found that duration of sensory and motor block was longer in Group B(perineurally) than in Group M (intramuscular).

DISCUSSION :

- Our study demonstrates that the mixture of tramadol and Levobupivacaine injected perineurally for supraclavicular brachial plexus block hastens the onset of sensory block, motor block and provides a longer duration of motor blockade and decreases the operative or post operative analgesic requirement compared to when tramadol given by intramuscular with levobupivacaine alone in block.

- Demonstrated that the addition of 100 mg of tramadol to levobupivacaine for axillary brachial plexus block prolongs sensory and motor block as compared to levobupivacaine given alone.
- Consequently, the results of that study suggest that tramadol has a specific analgesic effect on peripheral nerves. Their findings were same as that of our study, but there

was no significant difference in the onset of sensory and motor block among both groups in their study.[10]

- This finding of hastening the onset of sensory and motor block in tramadol perineural group may be contributed by a change in pH of the drug solution with addition of tramadol in our study.
- Observed that tramadol used as an adjuvant to levobupivacaine for single-shot interscalene or supraclavicular block, given either perineurally or intramuscularly provides a longer duration of postoperative analgesia when compared to interscalene block performed with 0.5% levobupivacaine alone in patients who underwent arthroscopic repair of rotator cuff tear.[11]

- The results of our study were entirely different from study by who observed that the addition of 100 mg of tramadol to 3.75 mg/ml of ropivacaine does not have any beneficial effect on the nerve block characteristics of axillary brachial plexus anaesthesia for arteriovenous fistula surgery in uremic patients.[12]
- In our study, only one patient in tramadol I.M group had nausea and was managed symptomatically.
- To summarize, our data support specific analgesic action of tramadol on peripheral nerves. This study is one in which tramadol has been given PERINEURAL as well as INTRAMUSCULAR as an adjunct to levobupivacaine in supraclavicular brachial plexus block.

CONCLUSION :

- The use of tramadol as an adjunct to levo-bupivacaine in supraclavicular brachial plexus block, hastens the onset of block, increases the duration of motor blockade. It also delays the requirement of the first dose of analgesic postoperatively without causing any side effects in comparison to systemically administered tramadol group.

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