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AN OBSERVATIONAL STUDY TO COMPARE FENTANYL WITH TRAMADOL AS AN ADJUVANT TO LOCAL ANAESTHETIC (LEVOBUPIVACAINE) IN SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK

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ABSTRACT

BACKGROUND OBJECTIVES: This study was undertaken to assess, safety and efficacy of fentanyl and tramadol as an adjuvant to Levobupivacaine in supraclavicular brachial plexus block.

MATERIAL AND METHODS: The study was conducted on 60 patients belonging to American Society of Anaesthesiologists Class I and II, planned for elective surgery.The patients were randomly allocated in 2groups of 30 each.GROUP A received 40 ml of 0.25% Levobupivacaine with fentanyl 1µg/kg, GROUP B- 40 ml of 0.25% Levobupivacaine with Tramadol 1mg/kg. Onset of sensory and motor block,duration of sensory and motor block as well as duration of analgesia was measured.

RESULTS: The onset and duration of sensory and motor block as well as duration of analgesia was significantly prolonged in tramadol group($p<0.0001$).

CONCLUSION: We concluded that Levobupivacaine with Tramadol hastens the onset of Sensory and Motor Block and prolongs the duration of Block and analgesia.

KEYWORDS : Fentanyl, Tramadol, Levobupivacaine, Supraclavicular Block

INTRODUCTION

The International Association for the Study of Pain define pain as a personal and subjective experience involving sensory, emotional and behavioural factors with actual or potential tissue injury [1]

Brachial plexus block is popular and very reliable regional anesthetic technique for upper limb surgeries.Various adjuncts to local anesthetics for brachial block have been used, which enhance quality and duration of anaesthesia , postoperative analgesia without causing adverse side effects or increasing duration of motor block. Midazolam, [4] magnesium, [5] opioids, [6] clonidine, [7] and dexmedetomidine [7] are few examples.

Tramadol[9], 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[8].

Fentanyl citrate is a potent opioid agonist. The principal actions are analgesia and sedation.

Levobupivacaine[10]S-enantiomer of bupivacaine has been shown to be safe,effective for epidural, spinal anaesthesia and blockade of the brachial plexus.

In this study, we want to study effect of fentanyl and tramadol as an adjuvant to Levobupivacaine in supraclavicular brachial plexus block.

MATERIALAND METHODS

This observational study was conducted in department of anaesthesiology for duration of one and a half year with sample size of 60 patients allotted in 2 equal groups.

Sample size was calculated using website http://openepi.com results from openepi version 3,open source calculator-same. For better validation of results the sample size is taken 30 in each group.

Inclusion on basis of ASA (American Society of Anaesthesiologists) grade I and II ,between the ages of 18-55 years, of either sex and those undergoing elective surgeries on lower arm, elbow, forearm and hand.

Exclusion criteria are patient's refusal for procedure, known hypersensitivity to local anesthetics, uncontrolled diabetes mellitus,a pregnant woman, pre-existing peripheral neuropathy, patients with cardiac conduction defect, patients with bleeding disorder and ASA III and above.

METHODOLOGY:

After approval of institutional ethical committee, 60 consenting patients fulfilling the inclusion criteria were considered for our study. A pre-anesthetic check-up was done for all patients which included a detailed history, general physical and systemic examination. Basic investigations were done.

Patients were kept nil per oral overnight. Patients were thoroughly aware about the visual analogue scale.

On arrival in the operating room, baseline heart rate, blood pressure, ECG and oxygen saturation were recorded. An intravenous line was secured in the unaffected limb and ringer lactate was started. Premedication of Inj. Glycopyrrolate 0.2mg and Inj. Ondansetron 4 mg given intravenously 5 minutes before giving supraclavicular brachial plexus block.

All the patients received brachial plexus block through the supraclavicular approach by an experienced anaesthesiologist different from the one assessing the patient intra and postoperatively. Both were blinded to the treatment groups.

Using classic technique approach, the midpoint of the clavicle was identified and marked. The posterior border of the sternocleidomastoid was palpated easily when the patient raised the head slightly. Palpating the belly of the anterior scalene muscle moving towards interscalene groove with the fingers, a mark will be made at approximately 1.5 to 2.0 cm posterior to the midpoint of the clavicle. By palpating the subclavian artery at this site, landmark was confirmed. After appropriate preparation and injection of a skin wheal, 23-G * 1. 1/2 inch needle was inserted at the point of entry above the midpoint of clavicle in the backward-inward-downward direction (BID). Although the direction of needle was towards the first rib, it was not always necessary to touch the rib. PNS guided supraclavicular block was given. When there is twitch in the forearm or hand at 1mA and drug was injected after negative aspiration of blood.

A 3 min massage was performed to facilitate an even drug distribution. Assessment of sensory block was done every 3 minutes after completion of drug injection in the dermatomal areas corresponding to median nerve, radial nerve, ulnar nerve and musculocutaneous nerve till complete sensory blockade.

Sensory block was assessed by pinprick test using 3-point scale.

0	Normal sensation
1	Loss of sensation of pinprick (analgesia)
2	Loss of sensation of touch (anaesthesia)

Assessment of motor block was carried out by the same observer at every 3 minutes till complete motor blockade after drug injection.

Motor blockade was done using Bromage three point score.

1	Normal motor function with full flexion and extension of elbow, wrist and fingers.
2	Decreased motor strength with ability to move the fingers only
3	Complete motor block with inability to move the fingers

Heart rate, systolic blood pressure(SBP), diastolic blood pressure (DBP) and saturation of oxygen(SpO_2) were recorded at 0 minutes,5 minutes,10 minutes, 15 minutes,30 minutes,45 minutes,60 minutes,90 minutes and 120 minutes. Adverse events like hypotension (20% decrease in relation to baseline) and bradycardia (heart rate <50 beats per minute) would be corrected with appropriate measures. All patients were given oxygen through venti mask at 4 ltr/min. No other sedative given intraoperatively.

At the end of surgery all the patients were monitored in anaesthesia recovery room for next 24 hrs. Patient were monitored for any Intra operative or Post operative complication like Hypotension, Bradycardia, confusion, dizziness, auditory and visual disturbances, convulsion, arrhythmias, respiratory depression.

Duration of motor and sensory blockade after surgery was recorded. Duration of analgesia was recorded every 30 mins post operatively.

1) Onset time of sensory block defined as the time interval between the end of total local anaesthetic administration and complete sensory block.
2) Duration of sensory block was defined as the time interval between end of local anaesthetic administration and complete resolution of anaesthesia on all nerves.
3) Onset of motor block defined as the time interval between the end of local anaesthetic administration and complete motor block.
4) Duration of motor block is defined as time interval between end of local anaesthetic administration and complete resolution of motor block.

Rescue analgesia Diclofenac sodium 75mg IM will be given when patient's

Visual analogue score (VAS) will be = or > 4.

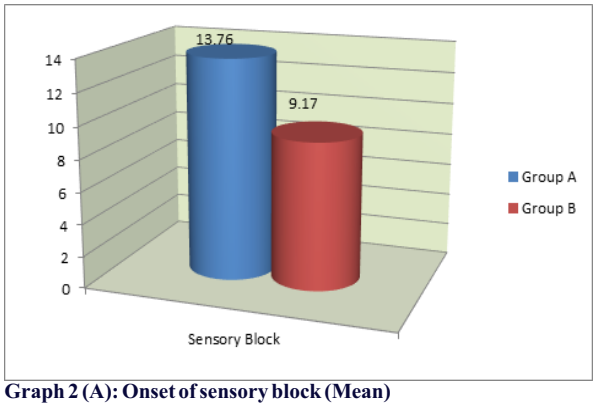
VISUAL ANALOGUE SCALE

VAS will be carried out with a 10 cm line. The 1st end mark '0' means 'no pain' and end marked '10' means 'severe pain'. The patients will be asked to mark the severity of pain experienced at that time in the post operative period every 30 minutes.

The severity of pain was evaluated as follows:
Visual analogue scale was explained to all the patients in the pre operative period

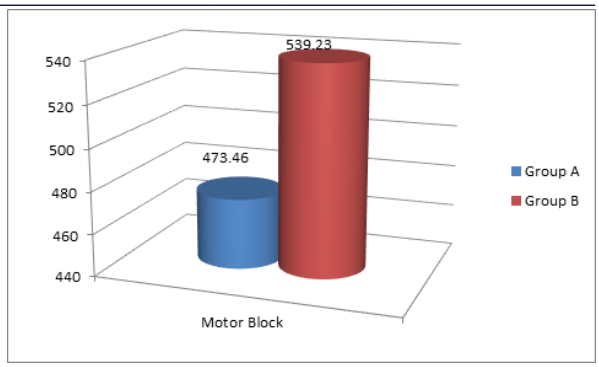
0	1	2	3	4	5	6	7	8	9	10
No Pain	Mild Pain			Moderate Pain			Severe Pain			

OBSERVATIONS AND RESULTS



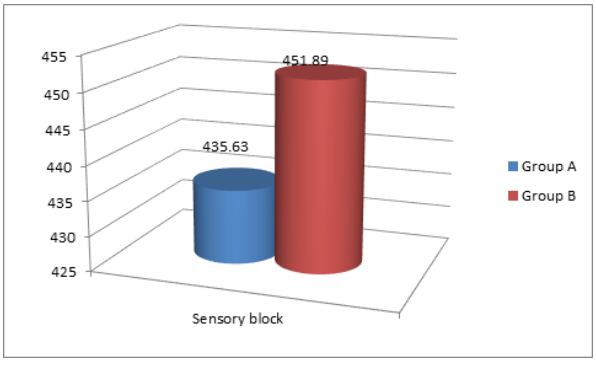
Graph 2 (A): Onset of sensory block (Mean)

For sensory block, p-value was < 0.0001, which clearly indicated that the difference in the time duration for the onset of sensory block in Group A vs Group B was statistically significant.



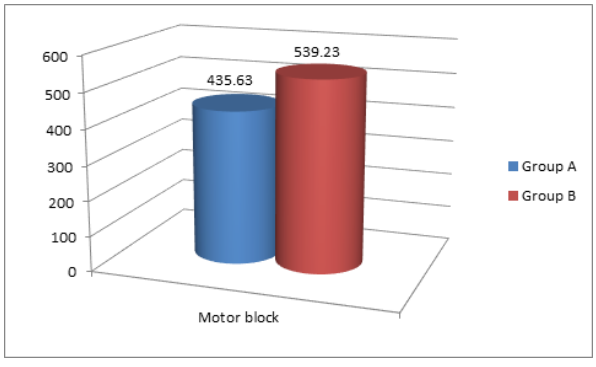
Graph 2 (B): Onset of motor block

For motor block, p-value was < 0.0001, which clearly indicated that the difference in the time duration for the onset of motor block in Group A vs. Group B was statistically significant.



Graph 3 (A): Duration of sensory block

P value is < 0.05 which clearly indicated that the difference in the time duration of sensory block in Group A vs Group B was statistically significant.



Graph 3 (B): Duration of motor block

The duration in Group B patients was longer for motor block compared to Group A patients which was statistically extremely significant. (p value < 0.0001)

DISSCUSSION

For sensory block, p-value was < 0.0001, which shows that the difference in the time duration for the onset of sensory block in Group A vs. Group B was statistically significant.

For motor block, p-value was < 0.0001, which clearly shows that the difference in the time duration for the onset of motor block in Group A vs. Group B was statistically significant.

The average duration for sensory block P value is < 0.05 which clearly indicated that the difference in the time duration of sensory block in Group A vs. Group B was statistically significant.The average duration for motor block. P value is < 0.0001 which shows that the difference in the time duration of motor block in Group A vs. Group B was statistically significant.

In study conducted by Vishal Nagpal et al demonstrated that the mixture of tramadol with bupivacaine injected perineurally for supraclavicular brachial plexus block hastens the onset of sensory block and motor block. It also provides a longer duration of motor blockade and postoperative analgesia as compared to other two groups in which tramadol was either injected intravenously or was not given at all.

Kapral *et al* studied that the addition of tramadol to mepivacaine for axillary brachial plexus block prolongs sensory and motor block as compared to mepivacaine given alone or mepivacaine given perineurally and tramadol intravenously. The results of this study suggest that tramadol has a specific analgesic effect on peripheral nerves. The findings were same as that of our study, but no significant difference in the onset of sensory and motor block among all the three groups in this study.

Kaabachi[37] *et al* reported that the benefit of block prolongation associated with the addition of tramadol to lidocaine during axillary block was limited by the slow onset of the block. In the study delayed onset might be due to the fact that they have used lidocaine with a quicker onset and different pharmacodynamic properties than bupivacaine.

The average duration for analgesia was 425.064 ± 13.47 mins in group A and 660.66 ± 39.29 mins in group B. P value is < 0.0001 which clearly indicated that the difference in the time duration of analgesia in Group A vs Group B was statistically significant.

Chatopadhyay *et al* also evaluated the use of tramadol as an adjuvant to bupivacaine, in supraclavicular brachial plexus block given for various upper limb surgeries. They then concluded that tramadol is a useful adjuvant which reduces the onset time of motor and sensory block and enhances the duration of sensory block, motor block and postoperative analgesia.

Alemanno *et al* observed that tramadol when used as an adjuvant to Levobupivacaine for single-shot interscalene block, given either perineurally or intramuscularly provides a longer duration of postoperative analgesia when compared to interscalene block performed with Levobupivacaine alone in patient

CONCLUSION

From the present study, we can call a halt that Tramadol when added to Levobupivacaine in Supraclavicular Brachial Plexus Block, hastens the onset of Sensory and Motor Block, prolongs the duration of Sensory and Motor Block and gives extensive duration of analgesia in the postoperative period with steady hemodynamics.

BIBLIOGRAPHY

1. Merskey H, Bogduk N, editors. Classification of Chronic Pain. 2nd ed. Seattle, WA: IASP Press; 1994. International Association for the Study of Pain (IASP). Task force on taxonomy part III. Pain terms. A current list with definitions and notes on usage; pp. 209–14.
2 Indelli PF, Grant SA, Nielsen K, Vail TP. Regional anesthesia in hip surgery. Clin Orthop Relat Res. 2005;441:250–5
3 Singelyn FJ, Deyaert M, Joris D, Pendeville E,Gouverneur JM. Effects of intravenous patient-controlled analgesia with morphine, continuous epidural analgesia, and continuous three-in-one block on postoperative pain and knee rehabilitation after unilateral total knee arthroplasty. Anesth Analg. 1998; 87:88–92.
4 Jarbo K, Batra YK, Panda NB. Brachial plexus block with midazolam and bupivacaine improves analgesia. Can J Anaesth. 2005;52:822–6.
5 Gunduz A, Bilir A, Gulec S. Magnesium added to prilocaine prolongs the duration of axillary plexus block. Reg Anesth Pain Med. 2006;31:233–6.
6 Singh SP, Singh V, Kaushal D, Jafa S. Effect of alkalinized bupivacaine and fentanyl mixture in supraclavicular brachial plexus block-a randomised double blind controlled trial. J Anaesth Clin Pharmacol. 2009;25:25–8.
7 Swami SS, Keniya VM, Ladi SD, Rao R. Comparison of dexmedetomidine and clonidine (α agonist drugs) as an adjuvant to local anaesthesia in supraclavicular brachial plexus block: A randomised double blind prospective study. Indian J Anaesth. 2012;56:243–9.
8 Debadasbiswal et al.,Sch.J.App. Med. Sci., Nov 2016; 4(11A):3883-3889
9. Robaux S, Blunt C, Viel E, Cuvillon P, Nouguier P, Dautel G, et al. Tramadol added to 1.5% mepivacaine for axillary brachial plexus block improves postoperative analgesia dose-dependently. Anesth Analg. 2004;98:1172–7