Volume : 5 | Issue : 12 | December-2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 78.46

Original Research Paper

EFFICACY OF LEVOBUPIVACAINE (0.5%) WITH VERAPAMIL (2.5 mg) FOR BRACHIAL PLEXUS BLOCK

Anaesthesiology

KEYWORDS: Brachial plexus block, Levobupivacaine, verapamil

Dr. Murali Krishna Chava — Assoiciate Professor Department of Anesthesiology Alluri sitarama Raju Academy Of Medical Sciences Eluru-534005,West Godavari ,A.P.

Dr. Chaitanya Birlangi — Final year post graduate, Department of Anesthesiology, Alluri sitarama Raju Academy Of Medical Sciences, Eluru-534005,West Godavari ,A.P.

ABSTRACT

Background: Calcium ions have an important role in analgesia mediated by local anaesthetics. Clinical trials have shown that verapamil can potentiate the analgesic effect of local anesthetics. In addition calcium ions play an important role in opioid receptor mediated analgesia also. AIM: The aim of this study is to evaluate whether additional anesthetic and analgesic effect could be derived from administration of verapamil a calcium channel blocker into brachial plexus sheath. OBJECTIVES: The objective of this study is to evaluate the effect of adding verapamil to levobupivacaine solution for supraclavicular brachial plexus blockade on onset and duration of sensory blockade , duration of analgesia and duration of motor block. METHOD: 60 ASA I and II patients undergoing upper limb surgeries lasting more than 30 minutes were included in the study. Patients were randomised into two groups (A & B) of 30 each and blinded. Group A(n=30) received brachial plexus block with 40ml of 0.5% Levobupivacaine with 1 ml normal saline, group B(n=30) received brachial plexus block with 40ml of 0.5% Levobupivacaine with Verapamil 2.5mg (1ml). RESULTS: The duration of sensory blockade was prolonged in group B (p=0.020) which was statistically significant, onset of sensory blockade, duration of analgesia and motor blockade were statistically not significant when compared to group A. CONCLUSION: Addition of verapamil to levobupivacaine solution for brachial plexus block prolongs the duration of sensory blockade, although the dosage used in our study did not significantly modify the duration of analgesia, it does suggest that there is scope for further using calcium channel blockers as an adjuvant to local anaesthetics. CONCLUSION: Addition of verapamil to levobupivacaine solution for brachial plexus block prolongs the duration of sensory blockade, although the dosage used in our study did not significantly modify the duration of analgesia, it does suggest that there is scope for further using calcium channel blockers as an adjuvant to local anaesthetics.

INTRODUCTION:

Peripheral neural blockade is now a well accepted component of comprehensive anaesthetic care. Its role has expanded from the operating suite to the post-operative and chronic pain management. The advantage of regional over general anesthesia in case of surgeries to the extremities, for out patient (ambulatory surgery) and anaesthetic practices have other bolstered intrest in peripheral nerve blocks. Use of calcium channel blockers appears to be an exciting and inexpensive field of study. Calcium ions have an important role in analgesia mediated by local anaesthetics. Calcium permeability is reduced by local anesthetics and clinical trials have shown that verapamil can potentiate the analgesic effect of local anesthetics.

METHODOLOGY:

60 ASA I and II patients undergoing upper limb surgeries lasting more than 30 minutes were included in the study at ASRAM MEDICAL COLLEGE AND HOSPITAL, ELURU. Patients of ASA III& IV, age <18 yrs and > 60 yrs were excluded from the study.

Brachial plexus block was carried out on all patients undergoing upper limb surgeries. Patients were randomised into two groups (A & B) of 30 each and were blinded. All drug solutions were prepared by a anesthesiologist not involved in administration of anesthetic agents, patient care, data collection. Group A (n=30) received brachial plexus block with 40ml of 0.5% Levobupivacaine with 1ml normal saline. Group B (n=30) received brachial plexus block with 40ml of 0.5% Levobupivacaine with Verapamil 2.5mg (1ml).

After strict aseptic precautions local anaesthesia was given at the site of insertion with 23G needle. A 22 G needle was inserted 1 to 2 cms above the midpoint of clavicle and lateral to the subclavian artery in the backward-inward –downward direction. After eliciting paraesthesia in the forearm or hand appropriate drugs were injected. Group A received 40 ml of 0.5% levobupivacaine with 1 ml normal saline and Group B received 40 ml of 0.5% levobupivacaine with verapamil 2.5 mg (1 ml) . Intraoperatively, no sedatives were given.

Parameters observed were :

The onset time of sensory blocked, defined as time between injection and total abolition of pinprick response, was evaluated in 4 nerve areas (median, ulnar, radial and musculocutaneous) at every 3 minutes until 40 minutes after the injection. The block was judged to have failed if anaesthesia was not present in 2 or more peripheral nerve distributions and such patients were excluded from study.

The duration of sensory blockade, defined as the time between onset of action and return of pinprick response which was assessed every 30 minutes in at least 3 major nerve distributions.

The duration of analgesia, defined as the time between onset of action and onset of pain and the time when patients received the first dose rescue analgesic.

The duration of motor block was assessed every 30 minutes till the return of complete muscle power in three major nerve distributions. During surgery pulse rate, arterial blood pressure and peripheral oxygen saturation were monitored. Nausea, vomiting, drowsiness or any other adverse effects - were also noted.

RESULTS:

The results were statistically analysed using Student's t- test. A 'p' value of less than 0.05 was taken to be statistically significant and a value less than 0.01 was highly significant.

TABLE 1: ONSET OF SENSORY BLOCKADE :

Onset of Sensory Block (min)	GROUP	N	MEAN	Std . Deviation	Std .Error Mean
	A	30	23.9000	4.13855	.75559
	B	30	23.2000	3.94269	.71983

p= 0.505

Table 1 shows the onset of sensory blockade was faster in group B, p valve is not significant (p= 0.505).

Volume : 5 | Issue : 12 | December-2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 78.46

TABLE 2: DURATION OF SENSORY BLOCKADE :

Duration of Sensory Block (min)	GROUP	N	MEAN	Std . Deviation	Std .Error Mean
	A	30	157.0000	44.25787	8.08034
	B	30	185.0000	46.53882	8.49679

p= 0.020

'In the above table Group B showed prolong duration of sensory blockade with a mean of 185min with SD 46.5min which was statistically significant. (p=0.020)

TABLE 3: DURATION OF ANALGESIA :

Duration of Analgesia (min)	GROUP	N	MEAN	Std . Deviation	Std .Error Mean
	A	30	302.0000	65.71884	11.99856
	B	30	318.0000	69.54433	12.69700

p=0.364.

The duration of analgesia was prolonged in Group B but was not statistically significant (p= 0.364).

TABLE 4: DURATION OF MOTOR BLOCKADE:

Duration of Motor Block (min)	GROUP	N	MEAN	Std . Deviation	Std .Error Mean
	A	30	149.0000	42.76399	7.80760
	B	30	161.0000	46.13922	8.42383

p= 0.30

The duration of Motor blockade prolonged in Group B but was statistically not significant (p=0.30)

DISCUSSION:

Verapamil, a synthetic papavarine derivative is an L type calcium channel blocker. Verapamil has been shown to have potent local anaesthetic property, reflecting inhibition of fast sodium channels. It induces fast channel blockade effects similar to the local anaesthetics.

Lalla et al 2010 in their study showed that adding verapamil to bupivacaine in brachial plexus block increased the duration of sensory blockade without any effect on duration of motor blockade and prolongation of analgesic duration. In our study with 0.5% levobupivacaine with verapamil we observed an increase in duration of sensory blockade .

Bourke et al evaluated the addition of morphine 0.1mg/kg or saline to lidocaine 1.5% plus epinephrine 5 mcg/ml.patients who had morphine added to the axillary block consumed significantly fewer oral analgesics than control.

Reuben et al showed the addition of verapamil to brachial plexus block with lignocaine prolong the duration of sensory anaesthesia, but it had no effect on analgesic duration.

Our study demonstrated a significant prolongation of local anaesthetic effect by verapamil when administered into brachial plexus sheath. Duration of sensory blockade was longer in Group B (185 +/- 46.54 min) compared to Group A (157 +/- 44.26 min) and this difference was statistically significant (p=0.020). However ,it had no effect on the analgesic duration or on the time taken for the onset of sensory blockade and duration of moter blockade.

Verapamil inbits various ionic processes, and its analgesic effects are comple. Verapamil blocks the slow inward transmembrane ionic current carried by calcium and or sodium in cardiac and vascular smooth muscle. Calcium permeability is reduced by local anesthetics, and clinical investigations have shown that verapamil can potentiate the analgesic effect of local anesthetics. It also induces fast channel blocking effects similar to local anesthetics and alter neuromuscular transmission.

CONCLUSION:

In conclusion addition of verapamil to levobupivacaine solution for brachial plexu block prolongs the duration of sensory blockade, although the dosage used in our study did not significantly modify the duration of analgesia, onset and duration of motor blockade, it does suggest that there is scope for further using calcium channel blockers as an adjuvant to local anaesthetics.

REFERENCES:

1. Atkinson RS , Rushman GB , Lee JA. Lee's Synopsis of Anaesthesia . 11 th edn. Butterworth Heinnman; 1993.
2. DB Murphy, CJ McCartney, VW Chan. Novel analgesic adjuncts for brachial plexus block :a systematic review. Anesth Analg 2000; 90:11228.
3. K Hara, Y Saito, Y Krihara. Antinociceptive effects of intrathecal L – Type Calcium Channel Blockers on viscera and somatic stimuli in the rat . Anesth Analogue 1998; 87: 382-7.
4. Malamberg AB, Yaksh TL. Voltage sensitive Calcium channels in spinal nociceptive processing:blockade of N & p type channels inhibits formalin induced nociception. J Neurosci 1994;148 :4482 -90.
5. Brose WG, Gutlove DP, RR. Use of intrathecal SNX- 111 A Novel N Type Calcium Channel blocker in the management of intractable brachial plexus pain . Clin J pain 1997; 133 :256-9.
6. V Pirec, E Charles, MD Laurito. The combined effects of N –type Calcium channel blockers and morphine on A delta versus C fiber mediated nociception . Anesth Analg 2001; 92 : 239-43.
7. Bazin JE, Massoni C, Groslier D. The aaition of Opiods to Local Anaesthetics in Brachial plexus block . Anaesthesia 1997; 52: 858-62.
8. Gaumann D, Forster A , Griessen M . Comparision of clonidine and epinephrine admixture to lidocaine for brachial plexus block .Anesth Analg 1992 ;75: 69- 74.
9. Aldrete J, Hohnson D. Evaluation of intacutaneous testing for investigation of allergy to local Anaesthetics. Anesth Analg 1971 ; 49 :173.
10. Reves JG, Kissin L , Lell WA . Calcium channel blockers;Uses and implications for Anaesthesiologists. Anaesthesiology 1982; 57 : 504 -18.