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Ondesetron as an adjuvant in supraclavicular brachial plexus block(original article)

Dr vasudha jadhav[1], Dr Ranjeetsinha jadhav[2] ,Dr B. M . Diwanmal.

Abstract: Brachial plexus block is a very helpful alternative to general anesthesia .The present study was done to asses the analgesic efficacy of ondensetron with bupivacaine in brachial plexus block. A prospective , randomized, double blind study was done at our institute (BVDU) Sangli maharastra 50 adult patients of ASA grade I and 2, aged between 18-65 years nd scheduled for various upperlimb surgeries . patients were divided into two groups of 25 each . Group A received 30 ml of bupivacaine .5% and2ml normal saline and group B received 30ml of bupivacaine and 8mgm of ondansetron . patients were observed for occurance of any complications , SBP,DBP, duration of motor block ,duration of pain relief. Duration of sensory and motor block was prolonged Post operative analgesia was longer in group B as compared to group A with p value <0.001. Pain score was significantly low in group B and 8.56 in group A with p value 20.05 Hence there was not significant difference . onset of motor block in group A was 9 min and group B was 7.9 min and Pvalue was 0.05 min Hence there was no statistical significant difference .

Addition of ondensetron 8 mgm to 30ml of bupivacaine .5% for supra clavicular brachial plexus block prolonged sensory blockade and reduced the dose of analgesics intraoperatively without increasing adverse effects

Keywords: *Bupivacaine,supraclavicular,brachial plexus block,ondensetron, postoperative analgesia.*

I. INTRODUCTION

Brachial plexus block is alternative to general anesthesia for upper limb surgeries providing complete muscle relaxation ,stable hemodynamics and post operative pain.

Hence the adjuvant drug should be easily available safe, cost effective, and has least side effects and good patient and surgeon acceptance. Ondensetron is an antagonist of 5-hydroxytryptamine -3 , which used commonly for prevention or treatment of postoperative nausea and vomiting[2] Also , it was shown by Ye et al.,[1] that ondensetron could block sodium channels similar to local anesthetic and had anti- nociceptive effect .It was demonstrated that peripheral 5- hydroxytrytamine -3 receptors were participated in the pathway of nociception . These peripheral receptors could bind to the opoid receptor and show agonist activityGregory et al.,[3] showed that ondansetron may be effective in preventing pain following injection of propofol by binding to the opoid receptors.Ambesh et al [4].,found that pain during injection of propofol can successfully prevent by administration of 4mg ondansetron.Also ,in another study performed by Reddy and colleagues,[5] it was shown that ondansetron 4mg could reduce significantly pain during injection of rocuronium and propofol.

II. METHODOLOGY

A prospective,double blind randomized study was carried out in BVDU Sangli India.50 adult patients of either sex,aged 18-60yrs,ASA physical status 1 and 2 and scheduled for various upper limb surgeries were recruited for the study.Patients having known allergy to test drugs,ASA grade 3 and 4 patients,patients on drugs that might have modified the pain perception,patients who refused to be enrolled in the study,patients with the history of coagulopathies,phrenic nerve or recurrent laryngeal nerve palsy or infection at the site of infection were excluded from the study

All enrolled patients were assesed by preanaesthetic examination.Informed consent was taken.Patients were premedicated with injection midazolam 0.5 to 1 mg 10 min before surgery .Emergency drugs and equipments including facilities for GA were kept ready.Brachial plexus block was performed by supraclavicular approach.Double blind randomization was done.The trial was so planned that neither investigator nor the patients were aware of the group allocation and drug received .

Patient was made to lay supine with head turned to opposite side with ipsilateral arm adducted after aseptic preparation,midpoint of clavicle and interscalene group was identified. At a point of 1 to 1.5cm posterior to midpoint of the clavicle,skin wheal was raised with local anaesthetic.A 22 gauge 4 cm short beveled needle was passed through the same point in a caudad slightly medial and posterior direction until paresthesia was elicited.After negative aspiration for blood,Study medication was injected

Patients in groupB received injection Bupivacaine 0.5 % 30ml plus NS 2 ml,patients in group inA received injection Bupivacaine 0.5% 30 ml +injection Ondansetron 8mg.Heart rate,blood pressure and respiratory rate were recorded preoperatively,intraoperatively every 10 min upto the end of surgery at 2 hrs,6hrs and 12 hrs.Onset of sensory block-time elapsed between injection of drug and complete loss of cold perception was tested by spirit soaked cotton on skin dermatomes C4-T2.Onset of motor block-time elapsed between injection of a drug to complete motor block was tested by adduction of shoulder and flexion of forearm and hand against gravity.Duration of sensory block-time elapsed between ingestion of drugs to appearance of pain requiring resque analgesia.Duration of motor block-time elapsed between ingestion of drug to complete return of motor block.Pain was assessed by an anaesthesialogist performing the block. Pain was assessed by numerical rating pain scale where 0 represents

no pain n 10 means worst possible pain.Duration of pain relief

was taken from time of onset of sensory block to time of
administration of resque analgesic.Resque analgesic was administered when pain score was 4 and above.Injection diclofenac 75 mg im was the resque analgesic.
Interval data are expressed mean and standard deviation chi square was used for analysis of non parametric data.A P value of less than 0.05 was considered stastically significant.
RESULTS:-
Demographic data of patients--

parameter	Group A	Group B	P value
Mean age	34.50+_12.69	33.28+_10.91	>0.05
Mean weight	58.4+_10.91	59.3+_6.79	>0.05

Out come	Group A	Group B	Pvalue
Mean duration of surgery(min)	65.6+_16.84	67+_14.43	>.0.05
Mean onset of sensory block(min)	8.36+_3.58	8.52+_4.18	>0.05
Mean onset of motor block	9.96+_5.69	7.92+_5.68	>0.05
Mean duration of motor block(min)	450.48+_57.95	608.96+_157.75	<0.001
Duration of pain relief(min)	502.24+_52.6	805.04+_175.75	<0.001
Numerical rating pain scale score at 12hrs	4.36	1.44	<0.001

Mean age was 35.40 years with a range of 18-60 years.Mean weight of group B and group A was 56.4+_6.79kg respectively and was comparable between two groups.Duration of surgery was 65.6+_16.84min 67+_14.43 min in group B and group A respectively and was comparable between two groups.
P value <0.05- statistically significant.
P value <0.001-statistically highly significant.
The mean onset of sensory block in two groups was equivalent with statistically no significant difference (p>0.05)(8.36+_3.58 min vs. 8.52+_4.18).The mean onset of motor block was faster in group B(7.96+_5.69min) but it was not statistically significant(p>0.05).Mean duration of motor block in group B patients was significantly longer(608.96+_157.75min)compared topatients in group A(450.48+_57.95min).
Numerical Rating pain scale scores.

Time	Group A	Group B	P value
6hr	4.12	0.24	<0.001
12 hr	4.36	1.44	1.56

III. DISCUSSION

Pain is an inevitable consequence of surgery.Opiods and nonsteroidal anti inflammatory drugs (NSAIDS) singly or incombination provide good analgesia but cause variousside effects.Most surgeries on fore arm and hand are intermediate and minor surgeries and have relatively short durationof severe postoperative pain[6].Supraclavicular approach is simple and cost effective and safe.[7]As nerve trunks are more compact in that area so homogeneous spread of the drug is there and fast onset of the block occurs.[8] Of various local anesthetics bupivacaine is reliable ,long acting local anesthetic when used in correct doses . Addition of hyalurinodase has produced decrease in duration of anaesthesia[9]. Farber and et al .colleagues [10]

showed that tropesetron have analgesic effect in patients with fibromyalgic pain.Also the analgesic effect of alosterone in female patients with diarrhea predominant irritable bowel syndrome was reported by Camilleri et al .,[11]and Muller et al.,[12] showed that local administration of 5-HT3antagonist had rapid analgesic effect in various rheumatic diseases.It was reported that this local anesthetic effect lasts significantly longer compared with local injection of local anesthetics combined with cortico steroids.YeJ and colleagues (8) showed that ondensetron has potent local anesthetic properties.more studies must be done to evaluate the efficacy of ondensetron and other 5-HT3 receptor antagonist in different orthopedic surgeries with different regional techniques.In conclusion adding ondensetron 8 mgm to bupivacaine in supaclavicular brachial plexus block reduced intraoperative and post operative analgesic use till 24hrs,decreased onset of sensory and motor block,increased duration of sensory block without causing significant adverse side effects.

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