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DEXMEDETOMIDINE (1MCG/KG) AS AN ADJUVANT IN SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK-COMPARATIVE STUDY OF 60 CASES.

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ABSTRACT Supraclavicular brachial plexus block is a popular and widely employed regional nerve block technique. Dexmedetomidine is selected as an adjuvant to local anaesthetics in brachial plexus block because it has been reported to prolong duration of action of local anaesthetics and significantly prolongs the duration of analgesia and has not been associated with any adverse complications.Objective of study is to compare the effect of dexmedetomidine added to bupivacaine and normal saline in bupivacaine in supraclavicular brachial plexus block.We studied 30 such patients in each group.Outcome was assessed in terms of onset of motor and sensory blockade,duration of motor and sensory blockade and post operative analgesia. We observed that addition of Dexmedetomidine 1mcg/kg to bupivacaine 0.5% solution in brachial plexus block reduces the onset and prolongs the duration of sensory and motor blockade, reduces the requirement of rescue analgesic in postoperative period.

KEYWORDS : Dexmedetomidine, Bupivacaine, Supraclavicular Brachial Plexus Block

INTRODUCTION

Brachial plexus block is a popular and widely employed regional nerve block technique for perioperative anaesthesia and analgesia for surgery of the upper extremity and supraclavicular approach is the easiest and most consistent method for surgery below the shoulder joint.The duration of sensory nerve blockade, and therefore analgesia with single shot regional anaesthesia is relatively short lived. Numerous perineural adjuvants have been used with local anaesthetics in regional anaesthesia in an attempt to optimize block characteristics and improve clinical outcomes. Recently, Dexmedetomidine has been studied as an adjuvant to local anaesthetic in peripheral nerve block. The pain relief after administration of dexmedetomidine is due to as it blocks the transmission in nociceptive C – fibers to reduce the pain. Dexmedetomidine is a very potent and highly selective α_2-agonist. Various studies have been done using Dexmedetomidine (1 mcg/kg) as an adjuvant to local anaesthetics mixture in brachial plexus block resulting in variable effects on onset but prolonged duration of analgesia and motor block. In this context the present study has been undertaken to evaluate the effect of Dexmedetomidine(1 mcg/kg), used as an adjuvant to 0.5 % bupivacaine in supraclavicular brachial plexus block, on the onset time and duration of sensory, motor block as well as post operative analgesia.

OBJECTIVE:

Objective of study is to evaluate the onset of sensory and motor blockade,duration of sensory and motor blockade,hemodynamic variables,number of rescue analgesics in post operative 24 hours and complication/side effect if any.

MATERIALS AND METHODS:

Includes the patient posted in Guru Gobind Singh Government Hospital,Jamnagar for elective and emergency orthopedic surgeries of elbow, forearm and hand were enrolled in the study from 2015 to 2017. The patients were subjected for detailed pre anesthetic Check up. The patients were also subjected for detailed laboratory work up including complete haemogram and urine routine. Patients were also subjected for HIV and HBsAg, Chest X ray and ECG examination.Study includes normal adult patients aged 18-60 years of either sex, ASA grade 1,2 without any comorbidity. (eg.diabetes, cardiovascular disease, neuromuscular disease, pregnancy, hepatic and renal failure, hypersensitivity to study drug). Brachial plexus block performed in supraclavicular route.

Patients were randomly allocated to one of the two groups

- Group B
- Group BD

Group B (n=30) :received 10 ml 2% lignocaine + 20 mL 0.5% bupivacaine and 1 mL 0.9%normal saline.

Group BD (n=30) :received 10 ml 2% lignocaine + 20 mL 0.5% bupivacaine and 1 mL Dexmedetomidine(1mcg/kg).

Study Design: Prospective, Randomized, Controlled, Double blinded study.

Assessment standards:

Immediately after block, patients were evaluated for the assessment of onset of sensory and motor blockade. Vitals were recorded before and after the procedure, at 5min, and there after every 10min till end of procedure and postoperatively at every 1 hour till 24 hours.

- Onset of sensory block was assessed by pin prick test areas innervated by radial, ulnar and median nerve. It was defined as time taken from the end of injection of study drug to the complete development of anaesthesia in all three sensory nerve of upper limb.
- Onset of complete motor was the time end of injection of study drug to loss of motor power at the shoulders. Motor block at shoulder was assessed by asking the patient to hand raise above head with movement of arm & forearm.
- Duration of motor block is the time from the onset of motor to complete recovery of motor block (able to hand raise above head with movement of arm & forearm).
- Duration of sensory block is the time from onset of sensory block to onset of pain at surgical site with pin prick.
- Duration of analgesia is the time from onset of sensory blockade (grade 1) to pain at surgical site.(visual analogue score)

OBSERVATION AND DISCUSSION:

About 60 patients, posted for upper limb surgeries were enrolled in this study as study subjects. They were randomly divide into two equal groups where first group(GROUP B) received 20ml of 0.5% Bupivacaine,10ml of 2% Lignocaine and 1ml of normal saline and second group(GROUP BD) received 10 ml of 2% Lignocaine, 20 ml of 0.5% Bupivacaine with 1 ml Dexmedetomidine (1mcg/kg mg) by supra clavicular approach. Cases with failure to achieve satisfactory block after initial dose were excluded from study.

DEMOGRAPHIC DATA:

The groups were comparable in respect to demographic parameters.

1] **AGE:** In our study the mean age of patient in group B was **37.27±9.72** years, in group BD was **32.77±10.67**

2] **SEX**: There were more male patient than female in both groups. There were no significant difference regarding the sex distribution between two groups.

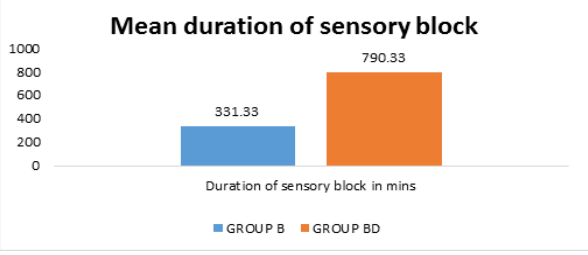
3] **DURATION OF SURGERY:** The mean duration of surgery in group B was **82.67±25.16** minutes, in group BD was **93.33±27.48** minutes.

4] **HAEMODYNAMIC CHANGES:** In our study, blood pressure, heart rate, respiratory rate and spo2 remained stable throughout the procedure and postoperatively as they did not differ significantly during the study period and no statistically significant difference was observed in all three groups(p>0.05).

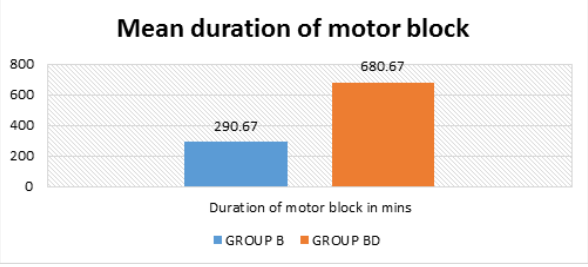
5] **ONSET OF SENSORY BLOCKADE:** In our study the onset time of sensory block was **20.13 ± 1.04** min in group B and **13.16 ± 2.38** min in group BD. The results was different in two groups. (p value = <0.001).

6] **ONSET OF MOTOR BLOCKADE:** In our study the onset time of motor block was **13.16 ± 2.38** min in group B versus **17.5 ± 2.47** min in group B was also different in the two groups (p value = <0.001).

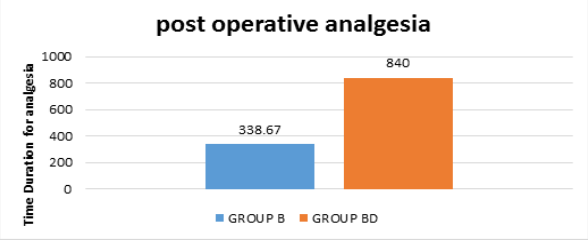
7] **MEAN DURATION OF SENSORY BLOCKADE:**The mean duration of sensory block in group B was **331.33 ± 34.52** minutes and **790.33 ±40.53** minutes in group BD.This difference was statistically significant between GROUP B and GROUP BD.(p value <0.001)



8] **MEAN DURATION OF MOTOR BLOCKADE:** The mean duration of motor block in group B was **290.67 ±39.91** minutes and the mean duration of motor block in group BD was **680.67 ±68.21** minutes.There was statistically significant difference in duration of motor block between GROUP B and GROUP BD.(p value <0.001)



9] **MEAN DURATION OF POSTOPERATIVE ANALGESIA:**The post operative analgesia in bupivacaine was **338.67 ± 34.27** minutes and in bupivacaine Dexmedetomidine group was **840.00 ±80.00** minutes. There was statistically significant difference in post operative analgesia between bupivacaine and bupivacaine-Dexmedetomidine group.(p value <0.001)



10] **COMPLICATION AND SIDE EFFECTS:**There was no incidence of headache, nausea, vomiting, hypotension, bradycardia, chest pain, coughing, convulsion and respiratory depression and procedure related complication. There was no CNS and CVS toxicity seen in either group in our study.

CONCLUSION:

Based on the present clinical comparative study and a short review of past literature we can conclude that addition of Dexmedetomidine to bupivacaine 0.5% solution in supraclavicular brachial plexus block shortens the onset of motor and sensory blockade, prolongs the duration of sensory and motor blockade, reduces the requirement of rescue analgesic in postoperative period. It reduces early post-operative analgesic requirements and has high level of patient satisfaction with this regional technique. Considering the thirteen studies discussed here, there is no clinical evidence that perineural Dexmedetomidine has any side effects.

We conclude that Dexmedetomidine is a promising adjuvant, which clearly and impressively prolongs the duration of analgesia in brachial plexus nerve blockade.

REFERENCES:

1]. Liu SS, Strodtbeck WM, Richman JM, Wu CL (2005) A comparison of regional versus general anesthesia for ambulatory anesthesia: a meta-analysis of randomized controlled trials. Anesth Analg 101: 1634-1642

2]. Singh Rebecca, Bisoi P, Mohanty SN, Debata PC. Study On Effect of Dexmedetomidine When Added To Bupivacaine On The Onset Time And Duration Of Block In Supraclavicular Brachial Plexus Block. J Pharm Biomed Sci 2015; 05(04):338-343

3]. Christiansson L (2009) Update on adjuvants in regional anaesthesia. PeriodicumBiologorum 111: 161-170.

4]. Förster JG, Rosenberg PH (2003) Clinically useful adjuvants in regional anaesthesia. CurrOpinAnaesthesiol 16: 477-486.

5]. Sandhya Agarwal, Ritu Aggarwal, Praveen Gupta1 Dexmedetomidine prolongs the effect of bupivacaine in supraclavicular brachial plexus block. Journal of Anaesthesiology Clinical Pharmacology | January-March 2014 | Vol 30 | Issue 1 IP:1.39.99.76

6]. Bhaskarbabu B. D., Kiran A. V. and P. R. Jajee:Dexmedetomidine as an adjuvant to local anaesthetics in Supraclavicular brachial plexus block- a comparative study; Journal of Chemical and Pharmaceutical Research, 2015, 7(8):421-424

7]. Gerlach AT, Dasta JF: Dexmedetomidine: An updated review. AnnPharmacother 2007; 41: 245- 52.