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Original Research Article

COMPARATIVE STUDY OF DIFFERENT DOSES OF DEXMEDETOMIDINE AS AN ADJUVANT TO INTRATHECAL HYPERBARIC BUPIVACAINE IN LOWER LIMB ORTHOPAEDIC SURGERIES

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Abstract

Background: This study is aimed to different doses of Dexmedetomidine as an adjuvant to Intrathecal hyperbaric bupivacaine in lower limb orthopaedic surgeries

Methods: A prospective randomized double blind study was conducted with 90 consenting patients of ASA grade I and II, scheduled for lower limb Orthopaedic surgeries. Using the lottery method, the patients were randomly allotted into 3 groups, 30 patients in each group. Group I , Group II & Group III.

Results: Post-operative VAS and total analgesic requirement in 24 hours were minimal in group C as compare to B group. All the patients achieved Bromage scale 3 motor block and there was dose dependent prolongation of motor block in B and C groups.

Conclusion: Supplementation of spinal Bupivacaine with Dexmedetomidine significantly prolonged both sensory and motor block compared with intrathecal Bupivacaine alone.

Keywords: Bupivacaine, Dexmedetomidine, Motor block.

Introduction

Pain is an unpleasant feeling often caused by intense or damaging stimuli. It has been defined by the International Association for the Study of Pain (IASP) as "An

unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage". [1]

Dexmedetomidine is highly selective α2 adrenergic agonist. Dexmedetomidine has been used as intrathecally as an adjuvant and no neurological side-effect is reported in humans. It also provides stable hemodynamic condition, good quality of intra-operative and prolonged post-operative analgesia with minimal side effects. Intrathecal α2 receptor agonists are found to have antinociceptive action for both somatic and visceral pain. [2-4]

Material and method

Type of study- A prospective randomized double blind study.

Inclusion criteria:

- Body weight less than 120 kg
- Height was more than 150 cm.

Exclusion criteria:

- Patients with hypotension, coagulation defects, spine abnormalities, heart block, arrhythmias etc.
- Body weight ≥120 kg and height ≤150 cm.
- Patients on calcium channel blockers, adrenergic receptor blockers, ACE inhibitors.

A prospective randomized double blind study was conducted with 90 consenting patients of ASA grade I and II, scheduled for lower limb orthopaedic surgeries. Using the lottery method, the patients were randomly allotted into 3 groups, 50 patients in each group. Group I , Group II & Group III. The surgeon, patient and the observing anaesthesiologist were blinded to the patient group.

Data analysis

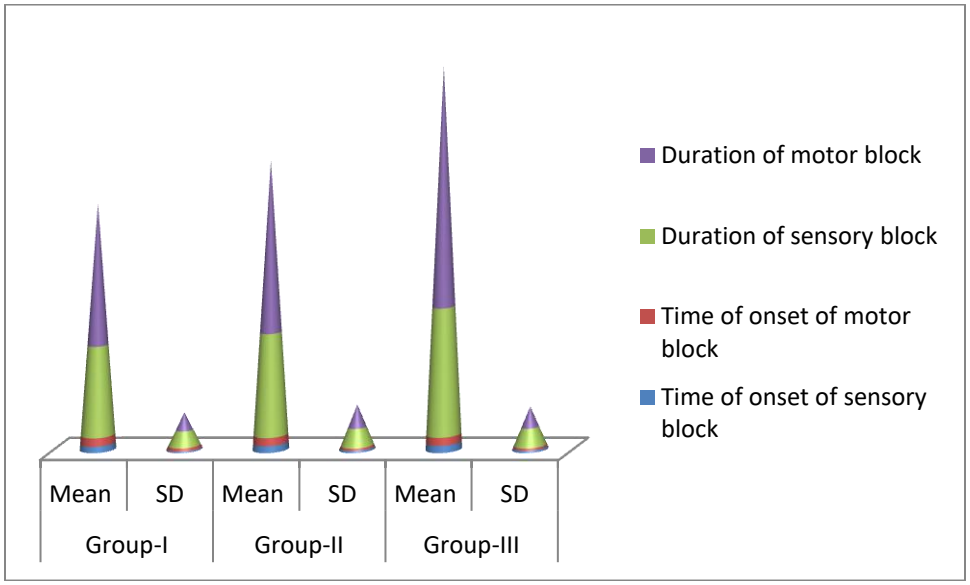
All data were analyzed by Epi-info software. Student t test and ANOVA test for parametric data. Chi square test for non-parametric data.

Result

Table 1: Socio-demographic variable

Variable	Group-I	Group-II	Group-III	P-value
Age in Yrs	32.13±8.26	34.25±8.62	36.16±9.19	>0.05
Male : Female	24:6	23:7	25:5	>0.05
ASA (I:II)	28:2	26:4	25:5	>0.05

All three group were comparable.



Post-operative VAS and total analgesic requirement in 24 hours were minimal in group C as compare to B group. All the patients achieved Bromage scale 3 motor block and there was dose dependent prolongation of motor block in II and III groups. Similarly regression of motor block to Bromage 0 was significantly prolonged in group III than II and I group. Complete recovery of sensory and motor functions was observed in all the patients.

Discussion

In our study post-operative VAS and total analgesic requirement in 24 hours were minimal in group C as compare to B group. All the patients achieved Bromage scale 3 motor block and there was dose dependent prolongation of motor block in II and III groups. Similarly regression of motor block to Bromage 0 was significantly prolonged in group III than II and I group. Complete recovery of sensory and motor functions was observed in all the patients. **Hutschala D, Mascher H et al** [5] added Clonidine to Bupivacaine and found that it enhances and prolongs analgesia after brachial plexus block via a local mechanism in healthy volunteers. **Niemi L et al**[6] studied effects of intrathecal Clonidine on duration of Bupivacaine spinal anesthesia, hemodynamics, and postoperative analgesia in patients undergoing knee arthroscopy and found that intrathecal Clonidine significantly prolongs the anesthetic and analgesic effects of Bupivacaine. Kalso A(4)reported that as compared to Clonidine, the affinity of DXM to [alpha] 2 receptors is ten times greater. Results of our study showed that addition of Dexmedetomidine to Bupivacaine although delays onset but, significantly prolongs the duration of sensory and motor block.

Mahmoud M. Al-Mustafa et al [7] added Dexmedetomidine to spinal Bupivacaine for urological procedures. He compared 5mcg (Group D 5) and 10 mcg (Group D 10) of Dexmedetomidine added to 12.5 mg Bupivacaine to Bupivacaine 12.5 mg with normal saline (Control group). The author found that the mean time of sensory block to reach T10 dermatome was 4.7±2.0 minute in D10 group, 6.3±2.7 minute in D5 group and 9.5± 3.0 minute in control group. The mean time to reach bromage 3 scales was 10.4±3.4 minute in D10 group, 13.0±3.4 minute in D5 group and18.0 ± 3.3 minute in control group. Regression time to reach S1 dermatome was 338.9±44.8 minute in D10 group, 277.1±33.2 minute in D5 group and165.5 ± 32.9 minute in control group. Time to reach bromage 0 was 302.9±36.7 minute in D10 group, 246.4.1±24.7 minute in D5 group and140.1 ± 32.3 minute in control group. They found that Dexmedetomidine has dose dependent effect on onset and regression of sensory and motor block.

Conclusion

Supplementation of spinal Bupivacaine with Dexmedetomidine significantly prolonged both sensory and motor block compared with intrathecal Bupivacaine alone.

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