



Anaesthesiology

A COMPARATIVE STUDY OF 0.75% HYPERBARIC ROPIVACAINE (3ML) WITH DEXMEDITOMIDINE AS ADJUVANT VS 0.75% HYPERBARIC ROPIVACAINE (3ML) WITHOUT ADJUVANT INTRATHECALLY IN LOWER LIMB SURGERY

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ABSTRACT

Introduction: Lignocaine and Bupivacaine are the drugs used for long time. In this setting one of the newer drug Ropivacaine has emerged and which is available as hyperbaric and isobaric solution. It is used mainly for epidural, subarachnoid block. Ropivacaine was chosen as 0.75% hyperbaric solution for this study. Dexmedetomidine was chosen as an additive to potentate the effects of local anaesthetics. **Objectives:** To compare the clinical effects of intra thecal ropivacaine and ropivacaine with dexmedetomidine with respect to - 1. Onset of sensory and motor blockade 2. Hemodynamic stability 3. Duration of sensory and motor blockade 4. Observed any side effects. **Material & Methods:** A prospective randomized clinical study is conducted on 50 patients of ASA grade 1, 2 and 3 belonging to the age group of 18-45 years undergoing lower abdominal surgery under spinal anesthesia to study the comparison of 0.75% hyperbaric ropivacaine (3ml) with dexmedetomidine as adjuvant vs 0.75% hyperbaric ropivacaine (3ml) without adjuvant intrathecally in lower limb surgery. Two group were divided. Group R received intrathecal injection of 0.75% hyperbaric ropivacaine(3ml) and Group D received intrathecal injection of 0.75% hyperbaric Ropivacaine (3ml). + Dexmedetomidine 3 g. **Results:** It was found that intrathecal hyperbaric ropivacaine in this study produces T7 - T8 level of sensory blockade with adequate motor blockade for lower abdominal surgeries and patients were hemodynamically stable. Group D patients early onset of sensory and motor blockade and delayed recovery from sensory blockade and motor blockade noted with prolongation of total duration of post operative analgesia and patients were more comfortable (free of anxiety) in this group D than group R. **Conclusion:** Hyperbaric Ropivacaine is a safe anaesthetic of choice for intra thecal use in abdominal surgery cases, (ASA I & II) and by adding dexmedetomidine we get early onset of sensory as well as motor block and prolonged duration of motor block and total time of post-operative analgesia.

KEYWORDS : Hyperbaric Ropivacaine, Dexmedetomidine, Lower limb surgery, Spinal Anaesthesia

INTRODUCTION

The subarachnoid block (or intra thecal) and epidural anaesthesia is a wonderful method of giving anaesthesia in lower abdominal and lower limb surgeries.

Lignocaine and Bupivacaine are the drugs used for long time. In this setting one of the newer drug Ropivacaine has emerged and which is available as hyperbaric and isobaric solution. It is used mainly for epidural, subarachnoid block.

Ropivacaine was chosen as 0.75% hyperbaric solution for this study. Dexmedetomidine was chosen as an additive to potentate the effects of local anaesthetics.

AIMS AND OBJECTIVES

To compare the clinical effects of intra thecal ropivacaine and ropivacaine with dexmedetomidine with respect to

1. Onset of sensory and motor blockade
2. Hemodynamic stability
3. Duration of sensory and motor blockade
4. Observed any side effects

MATERIAL AND METHODS:

A prospective randomized clinical study is conducted on 50 patients of ASA grade 1, 2 and 3 belonging to the age group of 18-45 years undergoing lower abdominal surgery under spinal anesthesia. After obtaining written informed consent, the patients were randomly allocated into 2 groups. Group R received intrathecal injection of 0.75% hyperbaric ropivacaine(3ml) and Group D received intrathecal injection of 0.75% hyperbaric Ropivacaine (3ml). + Dexmedetomidine 3 g.

Techniques

With the patient in the lateral position, under strict aseptic conditions, lumbar puncture will be performed at the level of L3 -L4 intervertebral space using a 25-gauge Quincke Babcock spinal needle. Once free flow of clear cerebrospinal fluid will be obtained, study drug for the patient (either hyperbaric Ropivacaine with or without Dexmedetomidine as an adjuvant) according to the group they belong will be injected over 20 - 30 seconds and patient will be laced in supine position immediately and gently without raising the extremities.

Statistical Analysis :

Quantitative data analysed by student's 't' test and qualitative by Chi square test. P value <0.05 will be considered to be statistically

significant. P value <0.001 to be highly significant.

RESULTS :

The two groups were not significantly different in respect of their mean ages ($38.67 \pm 13.98 = 38.50 \pm 12.88$, P value - 0.962).

The two groups were not significantly different in respect of their mean weight (59.70 ± 9.05 in Group R, 59.83 ± 10.73 in Group D, P value - 0.961).

The two groups were not significantly different in respect of their mean height (156.27 ± 5.78 in Group R, 153.90 ± 4.86 in Group D, P value - 0.091).

The difference between two groups at different time intervals studied was statistically insignificant (P>0.05).

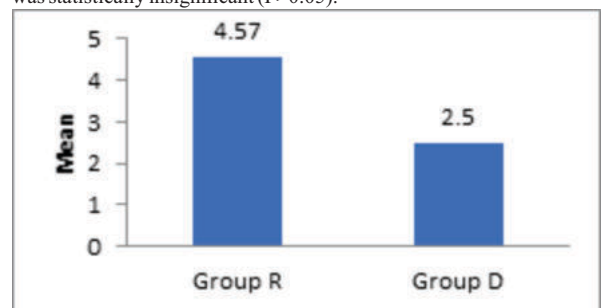


Figure - 1 : Onset of Sensory Block

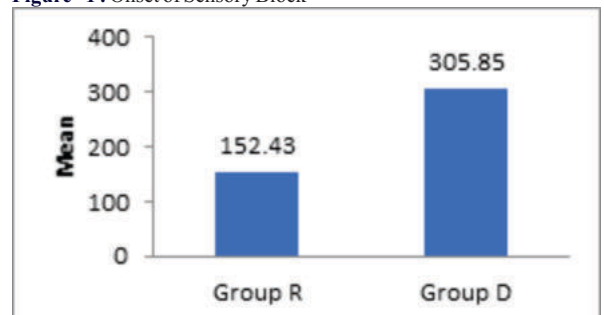


Figure - 2 : Duration Of Sensory Block

The time for onset of sensory block in group R was 4.57 ± 0.89 mins and 2.50 ± 0.51 min in group D. The onset of sensory block in group D was faster compared to group R and highly significant with $P < 0.00001$.

Total duration of sensory blockade in group R was 152.43 ± 3.08 mins while in group D was 305.83 ± 9.14 mins with P value < 0.00001 which is statistically much significant which suggests longer duration with group D.

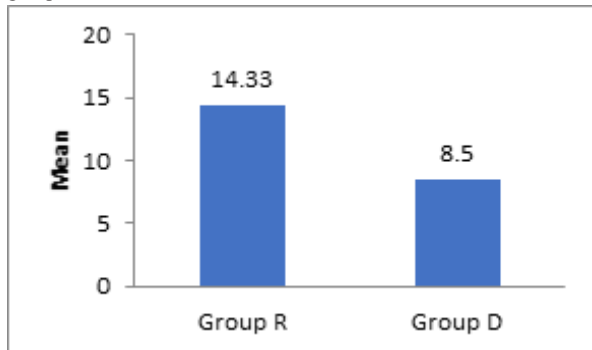


Figure -3: Onset Of Motor Block

The time for onset of motor block in group R was 14.33 ± 1.02 min and in group D was 8.50 ± 0.63 mins. There was statistically highly significant difference with regard to onset of motor block between the groups ($p < 0.00001$) which suggests faster onset with group D.

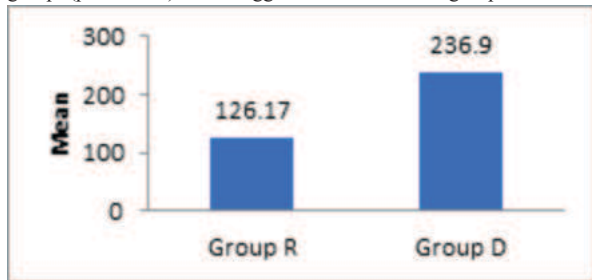


Figure -4 : Duration Of Motor Block

Total duration of motor blockade in group R was 126.17 ± 4.28 mins while in group D was 236.90 ± 7.76 mins with P value < 0.00001 which was statistically much significant which suggests longer duration of motor block.

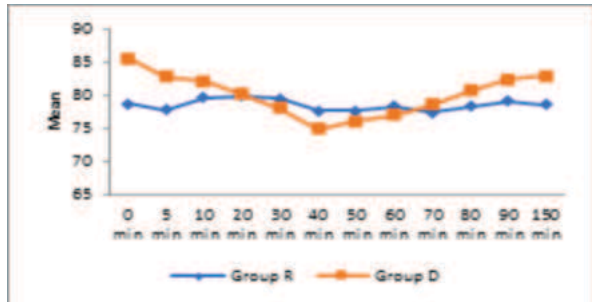


Figure -5: Effect On Heart Rate

The difference between two groups at different time intervals studied was statistically insignificant ($P > 0.05$).

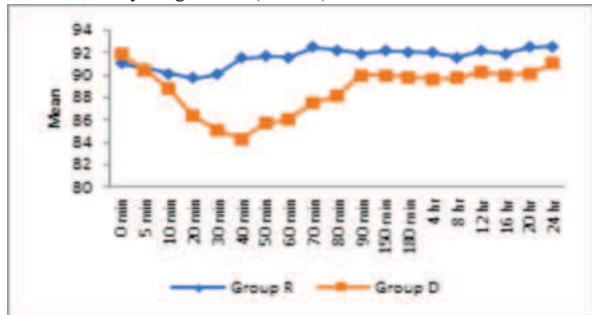


Figure -6: Effect On Mean Arterial Pressure

The difference between two groups at different time intervals studied was statistically insignificant ($P > 0.05$). Except for 30 - 80 mins duration in group D has significant P value which indicates episodes of Hypotension.

DISCUSSION:

Onset of sensory and motor block was early in group D patients than group R (group D 2.50 ± 0.51, 4.57 ± 0.89 in group R) with the 'P' value < 0.00001 . Which can be seen in observations of Table 6 and Table -8.

As can be seen in Sulekha Saxena, Kuljit Kumar MBBS, Avinash Agrawal, Rajni Gupta & Ashwin Yadav, did a Comparative Study of Hyperbaric Ropivacaine with Dexmedetomidine as a Lower Abdominal Surgeries - A Double Blind Randomized Trial found Dexmedetomidine may be more suitable drug in surgeries in which muscle relaxation has greater value in lower abdominal surgeries.

And as well as Gupta R, Bogra J, Verma R, Kohli M, Kushwaha JK, Kumar S. Dexmedetomidine as an intrathecal adjuvant for postoperative analgesia, concluded that the addition of dexmedetomidine to ropivacaine intrathecally produces a prolongation in the duration of the motor and sensory block.

Duration of total motor block was more with group D patients than group R (Group D - 236.90 ± 7.76, 126.17 ± 4.28 group R with p value < 0.00001). As can be seen in observations with Table -9

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Total duration of post op analgesia in group D was 431.00 ± 19.18 mins with P value < 0.00001 which was statistically much significant which suggests longer duration of post op analgesia. As can be seen in observations with Table -10

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No patients have developed any nausea or vomiting in both groups. But in group D, patients were free of anxiety and comfortable. Both groups didn't require any sedation intra operatively.

CONCLUSION:

Hyperbaric Ropivacaine is a safe anaesthetic of choice for intra thecal use in abdominal surgery cases, (ASA I & II) and by adding dexmedetomidine we get early onset of sensory as well as motor block and prolonged duration of motor block and total time of post-operative analgesia.

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