



An Observational Study to Compare the Effect of Intrathecal Different Doses of Dexmedetomidine with Ropivacaine in Spinal Anaesthesia in Hernioplasty

KEYWORDS

Hernioplasty, dexmedetomidine, isobaric ropivacaine, spinal anaesthesia

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ABSTRACT AIMS AND OBJECTIVES:

Effect of intrathecal dexmedetomidine as an adjuvant to isobaric ropivacaine in spinal anesthesia for Hernioplasty is not much investigated. The objective was to assess the dose dependent effect of dexmedetomidine (3 mcg vs 5 mcg) as an adjunct to isobaric ropivacaine in spinal anesthesia.

Materials and Methods: Sixty selected patients were randomized to receive intrathecal 0.75% isobaric ropivacaine 3.5ml with dexmedetomidine 3 mcg (Group D3) or 5 mcg (Group D5) in spinal anesthesia for Hernioplasty. Block characteristics, hemodynamic changes, postoperative analgesia and adverse effects were compared.

Results: Both groups were comparable regarding sensory-motor block characteristics and postoperative analgesia

Conclusion: We concluded that spinal anesthesia with 0.75% isobaric ropivacaine (3.5ml) with dexmedetomidine 5 mcg is better than 3mcg.

INTRODUCTION

JOHN DRYEN (1631-1701) said "for all happiness mankind can gain not in pleasure but in rest from pain". Pain is the most common symptom that brings patients to see a physician. Pain is not just a sensory modality but it is an experience.¹

Regional anaesthesia has emerged as an important technique, with simplicity, effectiveness and safety as its added advantages. Spinal anaesthesia has many advantages like easy to perform, rapid onset of action and good muscle relaxation and early recovery. One of the main disadvantages is its limited duration of action and hence lack of postoperative analgesia. Ropivacaine is one of the effective long acting local anaesthetic.²

Alpha-2 (α_2) adrenergic receptor agonist has focus of interest due to:

- Sedative
- Analgesic
- perioperative sympatholytic
- hemodynamic stabilizing properties.

AIM AND OBJECTIVE

AIM-

The aim of the study is to compare the effect of Dexmedetomidine 3 μ g and 5 μ g as an adjuvant to Isobaric 3.5ml 0.75% Ropivacaine in spinal anaesthesia.

OBJECTIVES-

To Compare :-

1. Onset and duration of sensory blockade.
2. Onset and duration of motor blockade.
3. Duration of analgesia
4. Haemodynamic parameters – Heart Rate, Systolic Blood Pressure, Diastolic Blood Pressure.
5. Side effects/complications

MATERIAL AND METHODS

After approval from ethical committee and written informed consent 60 patients were selected for elective surgery under spinal anesthesia.

SELECTION CRITERIA:

Inclusion criteria:

- ASA I & ASA II patients undergoing Hernioplasty.
- Patients aged between 18-60 years of both the gender.
- Patients willing to sign informed consent.

Exclusion criteria:

- Patients with medical complications like severe hypovolemia, shock, septicemia, and hypertension.
- Patients with coagulation disorders or on anticoagulant therapy.
- Local infection at the site for spinal anesthesia.
- Patient refusal.
- H/o Ischemic heart disease, cardiac conduction defect
- ASA group III or more
- H/o drug allergy to study drug

A pre-anesthetic check up was done in all patients which included a detailed History, General, Systemic Examination and Routine Investigations.

Monitoring -

- Pulse
- NIBP
- SPO₂
- ECG

On the day of Surgery Patient was preloaded with ringer lactate 10ml/kg.

Pre Medication:

Inj. Glycopyrolate 0.2 mg IV

Inj. Emset 4 mg IV

Intraoperative-

- Under aseptic precaution lumbar puncture at L3-L4 interspace using 23G spinal needle with patient in sitting position was performed.
- Study drug was injected to the respective group pa-

tients into the subarachnoid space after noting free flow of CSF with the operating table kept flat. Patient turned supine immediately and supplemental oxygen @ 3-4 ltrs/min was given.

- Group D3 received 3.5ml, 0.75% isobaric Ropivacaine + 3µg Dexmedetomidine
- Group D5 received 3.5 ml, 0.75% isobaric Ropivacaine + 5µg Dexmedetomidine
- No intravenous sedation was given and at the end of surgery all patients were monitored in post-op recovery.

Assessment of Sensory Blockade:

Tested by pinprick using Hypodermic needle

- Time to reach T10 Segment was considered as onset of sensory block and duration of sensory was counted from onset to the time of two segment regression.

Assesment of motor blockade :

- Tested by bromage scale
- Onset of motor block was taken as bromage scale 3 i.e patient unable to move hip, knee and ankle
- Duration of motor block was taken from onset to Bromage scale 0 i.e able to move hip, knee and ankle.

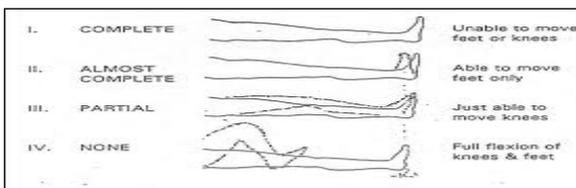
Bromage scale:

Bromage 0: the patient is able to move the hip, knee and ankle.

Bromage 1: the patient is unable to move the hip, but is able to move the knee and ankle.

Bromage 2: the patient is unable to move the hip and knee, but is able to move the ankle.

Bromage 3: the patient is unable to move the hip, knee and ankle.



Onset of sensory and motor block was assessed every 2mins for 1st 10 mins and then every 10 mins upto 30 mins , then every 30 mins.

Hemodynamic changes : Pulse rate , Systolic and Diastolic blood pressure,SPO₂ was monitored at regular intervals

Post operation duration of sensory and motor block and analgesia was assessed every 15 mins for first two hours and then every 30 mins

Duration of analgesia :

- Assessed using visual linear analogue scale (VAS) and was explained to patient one day prior to surgery
- It was carried out on 10 cm line where 1st end mark '0' means no pain and end mark '10' means severe pain and patient was asked to mark the severity.VAS 4 was considered as time for rescue analgesia.

Parameters were Measured:

- Heart rate
- Systolic and Diastolic blood pressure
- SPO₂
- Onset of sensory blockade(T10 segment level when achieved)
- Onset of motor blockade (bromage scale 3)
- Total duration of sensory block

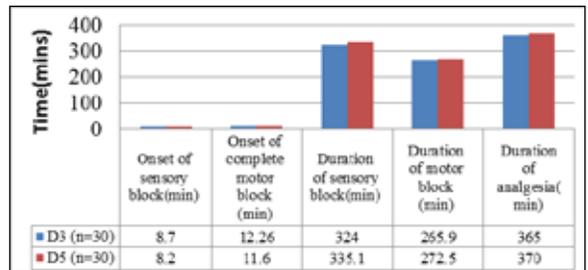
- Total duration of motor block
- Duration of analgesia(when patient complains of moderate pain VAS> 4 (Visual analogue scale) post operation,rescue analgesia inj diclofenac 1.5 mg/kg was given.
- Complications , if any

OBSERVATIONS AND RESULTS

Table 1. Demographic data of two studied groups.

| Characteristics | Group D3(n=30) | | p Value |
|-----------------|----------------|--------------|-----------|
| AGE(yrs) | 42.63 ± 7.38 | 40.10 ± 9.42 | 0.269(NS) |
| ASA(I / II) | 24/6 | 25/5 | - |
| GENDER(M/F) | 22/8 | 24/6 | - |
| WEIGHT(Kg) | 68.3 ± 0.98 | 68.17 ± 1.18 | 0.931(NS) |
| HEIGHT (Cm) | 164 ± 1.14 | 165.5 ± 1.09 | 0.346(NS) |

Demographic parameters were comparable between the two groups.



Statistically significant difference was found between both groups with regard to the onset and duration of sensory block and duration of motor block(P<0.05= significant).

There was statistically significant more rapid onset of complete motor block in group D5 than in group D3(P value <0.05= statistically significant).

The duration of analgesia was more prolonged in group D5 than in group D3 (P<0.05= statistically significant).

Adverse effects in the two studied groups:

- The adverse effects were none in group D3 and group D5.

DISCUSSION

There are various studies showing Dexmedetomidine in a dose of 5µg, but we studied that Lesser dose 3µg has any efficacy over 5µg ?? and observed that

Dexmedetomidine has a dose-dependent efficacy of Iso-baric Ropivacaine in lieu of greater duration of sensory & motor blockade and also the lesser time required to achieve the desired blockade.

Dexmedetomidine, owing to its 2 adrenergic agonist action has a synergistic effect on local anesthetics through prolongation of the sensory block by depressing neurotransmitter release from C-fibers of the spinal cord leading to hyperpolarization of postsynaptic dorsal horn neurons. [2]

Motor block prolongation also occurs in conjunction by binding of 2 agonists to motor neuron in the dorsal horn of spinal cord.[3]

Above properties could have contributed to enhance anaesthetic effects with the usage of 5 µg Dexmedetomidine which are coherent with previous studies by GUPTA *et al* [4] and AL GHANEM *et al.* [5]

U NAITHANI *et al.*, used 3 & 5 mcg Dexmedetomidine with 0.5% Isobaric Ropivacaine (3 ml) in Abdominal Hysterectomy. Results were not satisfactory may be because of choice of Surgery & Dose of Ropivacaine which was only 15mg in their cases. [6]

CONCLUSION

From this study, we conclude that Dexmedetomidine in dose of 5µg with Isobaric Ropivacaine in spinal anaesthesia provides:

- **faster onset of sensory & motor blockade.**
- **longer duration of analgesia.**

as compared to Dexmedetomidine 3µg with Isobaric Ropivacaine in spinal anaesthesia.

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