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# A prospective randomized double blind study comparing isobaric ropivacaine 0.5% with dexmedetomidine and 0.5% ropivacaine alone in spinal anaesthesia in lower limb and perineal surgeries

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**Abstract**

**Introduction:** The versatility of spinal anaesthesia is afforded by a wide range of local anaesthetics and additives that allow control over the level, the time of onset and the duration of spinal anaesthesia. The present study was conducted to compare the effects of isobaric ropivacaine 0.5% with and without dexmedetomidine 5 mcg in spinal anaesthesia in lower limb and perineal surgeries in terms of the onset of sensory and motor block, duration of sensory and motor block, and duration of analgesia.

**Material and Methods:** In this prospective randomized double blind study, 60 patients of physical status ASA I & II scheduled for lower limb and perineal surgeries under the subarachnoid block were randomized to receive either intrathecal 3 ml of 0.5% isobaric ropivacaine with 0.05 ml of 5 mcg preservative dexmedetomidine (Group RD, n=30) or 3 ml of 0.5% isobaric ropivacaine with 1 ml of normal saline (Group R, n=30). Onset of sensory block, maximum level of sensory block, time taken to achieve maximum sensory level and duration of sensory block was noted. The degree of motor block was assessed every 5 min for first 30 min and then every 15 min till completion of surgery.

**Results:** The mean time for onset of sensory block was 8.23±2.91 min in Group RD and 8.76 ± 2.97 min in Group R. The mean time for onset of motor block in group RD was 11.8±2.52min and 12.46 ± 2.51 min in group R. The mean duration of sensory block was prolonged (191.03±32.97min) in group RD than group R (169.13±30.98 min). The mean duration of motor block was also prolonged in group RD than group R (4.41±0.49 hrs vs 3.6 ±0.55 hrs The mean duration of analgesia was 7.52 ± 2.10 hrs in group RD and4.25 ± 1.80 hrs in group R. Hypotension was observed in 4 (13.33%) patients in group RD and in (6.66%) patients of group R. Bradycardia was observed in 2 (6.66%) patients from both the groups.

**Conclusion:** We conclude that Dexmedetomidine as an adjunct to 0.5% Ropivacaine is superior to 0.5% Ropivacaine alone in spinal anaesthesia. It augments the onset and duration of sensory and motor block, as well as total duration of analgesia thus, reducing the requirement of analgesics in postoperative period.

**Keywords:** ropivacaine, dexmedetomidine, spinal anaesthesia, lower limb surgeries

## Introduction

Spinal anaesthesia, a form of regional anaesthesia, where conduction block of nerve roots is achieved by injecting a small volume of local anaesthetic solution into the subarachnoid fluid through a lumbar puncture. It is a simple technique that provides a rapid, dense and predictable state of anaesthesia [1]. The selection of the local anesthetic to be used for spinal anesthesia is usually based on the expected duration of surgery and needs for early patient discharge. Traditionally amide and ester linked local anaesthetics such as lignocaine, bupivacaine, cinchocaine and tetracainehave been commonly used drugs for spinal anaesthesia [2]. But, these drugs carry undesirable effects like cardio toxicity and central nervous system toxicity [3]. Ropivacaine, a new amide local anaesthetic, is known to be less toxic to central nervous system and cardiovascular system and is widely used as an alternative to bupivacaine. Ropivacaine also belongs to the same pipecoloxylidide group; it has a propyl group on the amine portion of pipecoloxylidide whereas bupivacaine has a butyl-1 group. It is the first commercially available local anaesthetic in its category as a pure S-enantiomer [4]. The efficacy and safety of intrathecal administration of both plain and hyperbaric solutions of ropivacaine have been evaluated in different surgeries, including orthopedic and urologic surgery [5, 6]. Ropivacaine has high pKa and lower lipophilicity, which blocks Aδ and C (pain fibers) to a greater degree than Aβ (motor fibers) leading to decreased post-operative motor blockade and thus early ambulation of the patients can be achieved. But shorter duration of sensory and motor block can itself be a drawback if the surgery prolongs or the quality of motor blockade is poor, hence to overcome these drawbacks adjuvants are commonly added to ropivacaine [7].

Alpha-2 adrenergic agonists have both analgesic and sedative properties. They also potentiate the effect of local anaesthetics and allow a decrease in required doses when used as an

adjuvant in regional anaesthesia. Intrathecal administration of clonidine (alpha-2 adrenergic agonist) prolonged motor blockade induced by local anaesthetic [8]. Dexmedetomidine is more selective alpha-2 adrenoceptor agonist and the affinity of dexmedetomidine to alpha-2 adrenoceptors is eight-times greater than clonidine, so, it is more advantageous in clinical anaesthesia [9]. Dexmedetomidine possess hypnotic, sedative, anxiolytic, sympatholytic, opioid-sparing and analgesic properties without producing significant respiratory depression. It acts by inhibiting the release of nor-epinephrine at locus coeruleus. Small doses of dexmedetomidine (3 μg) used in combination with spinal bupivacaine produces a shorter onset of motor block and a prolongation in the duration of motor and sensory block with preserved hemodynamic stability and minimal side effects. The enhanced anti- nociceptive effect is said to be related to its lipophilicity [10].

The present study was conducted to compare the effects of isobaric ropivacaine 0.5% with and without dexmedetomidine 5 mcg in spinal anaesthesia in lower limb and perineal surgeries in terms of the onset of sensory and motor block, duration of sensory and motor block, and duration of analgesia.

## Materials and Methods

In this prospective randomized double blind study, a total of 60 patients of ASA physical status I & II scheduled for lower limb and perineal surgeries under the subarachnoid block were included after institutional ethical committee approval and obtaining informed written consent from each patient.

The patients were randomized to receive either intrathecal 3 ml of 0.5% isobaric ropivacaine with 0.05 ml of 5 mcg preservative dexmedetomidine (Group RD, n=30) or 3 ml of 0.5% isobaric ropivacaine with 1 ml of normal saline (Group R, n=30).

### Inclusion Criteria

1. Adult patients between age groups of 25 to 65 years of age
2. Patients of physical status ASA grade I and II
3. Patients scheduled for lower limb and perineal surgeries under subarachnoid block.
4. Patients willing to participate in study

### Exclusion Criteria

1. Patients with severe cardiac or pulmonary diseases
2. Patients with neurological dysfunction
3. Patients with bleeding and coagulation disorders
4. Patients known allergic to local anaesthetic amide
5. Patients with deformed spinal column
6. Patients with infection at site of lumbar puncture

### Procedure

Subarachnoid puncture was performed aseptically in lateral position with a 25 G Quinke's needle by midline approach at the L3-4 interspace and one of the study drug was given over 30 seconds according to group allocation. The direction of needle aperture was cranial during injection.

Immediately after intrathecal injection, patients were laid supine. The onset and duration of sensory blockade with maximal cephalad spread, the onset, intensity and duration of motor blockade were recorded at 1 and 2 min followed by at 2 min interval till the surgical anaesthesia achieved at the dermatome level T10. The segmental level of sensory block to pin prick were evaluated bilaterally along the mid-clavicular lines.

### Assessment

Sensory block was assessed by loss of sensation to pin prick in the midline using a 22 Gauge blunt hypodermic needle every 2 min interval until T10 dermatome was reached and then every 5 min interval until no change in level occurred. Onset of sensory block to T10 dermatome level, maximum level of sensory block achieved, time taken to achieve maximum sensory level and duration of sensory block (interval from administration of drug until the regression of sensory block to S1 dermatome) was noted.

The degree of motor block was assessed every 5 min for first 30 min and then every 15 min till completion of surgery by the modified Bromage score.

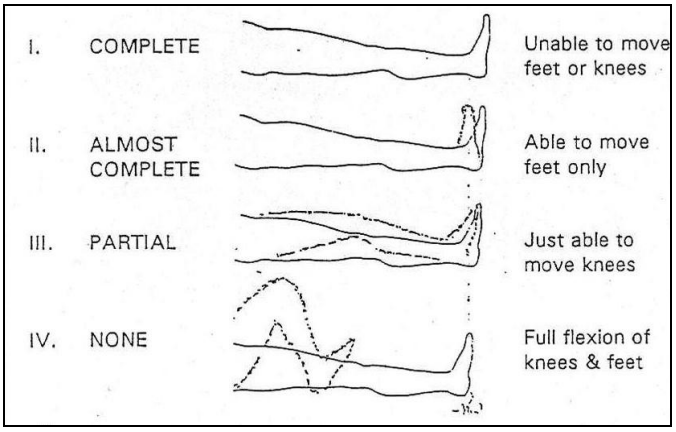


**Fig 1:** Modified bromage scale for assessing motor block and degree of paralysis

**Table 1:** Modified Bromage Scale

| Score | Criteria |
|---|---|
| Bromage 0 | Patient is able to move hip, knee and ankle |
| Bromage 1 | Inability to move the hip but is able to move knee and ankle |
| Bromage 2 | Inability to move hip and knee but can move ankle |
| Bromage 3 | No movement at all and unable to move hip, knee and ankle |

Pre-operatively pulse rate, non-invasive systolic and diastolic blood pressure (DBP) and respiratory rate was recorded. In the operation room, a good intravenous access was secured and patients were preloaded with 10 ml/kg body weight of Ringer Lactate solution over 15-20 min. Multipara monitor was attached and baseline pulse rate, noninvasive systolic blood pressure (SBP) and DBP, oxygen saturation, and electrocardiogram (ECG) were recorded and monitoring was initiated. The study drug was prepared by an anesthesiologist who then handed it to another anesthesiologist blinded to the nature of the drug given to him or her.

SPSS version 16 was used for statistics. Unpaired and paired

t-test was used for quantitative nominal data (mean +/-) whereas, categorical data was used to compare x2 and Mann Whitney-U test where appropriate. P <0.05 was considered significant and <0.01 was considered highly significant.

## Results

In the present study majority of the patients were in the age group of 31-50 years of age in both the groups. The mean age of the patients in group R was 44.46±10.45 years whereas the mean age in group RD was 45±10years. Age incidences between two groups were comparable. In group R 40% were males and 60% were females whereas in group RD 36.67% were males and 63.33% were females. Majority of the patients in both groups were females and the groups were comparable with respect to sex distribution with no significant difference between the groups.

**Table 2:** Demographic data

| Groups | Group R (n=30) Mean ± SD | Group RD (n=30) Mean ± SD |
|---|---|---|
| Age | 44.46±10.45 | 45±10 |
| Sex (M:F) | 12:18 | 11:19 |
| Type of surgery | | |
| Lower Limb Surgeries | 17 | 18 |
| Pelvic surgeries | 09 | 06 |
| Perineal surgeries | 04 | 06 |

The mean duration for onset of sensory block in group R was observed to be of 8.76±2.97min whereas in group RD was 8.23±2.91min and the difference observed was not statistically significant. The mean onset of motor block in group R was 11.8±2.52 whereas in group RD was 8.97±2.54 and the difference observed was statistically significant. It was seen that the mean duration of sensory block was 169.13±30.98 in group R and 191.03± 32.97 in group RD and the difference observed in group R and group RD was statistically significant. The mean duration of motor block in group R was 216 ±33 min whereas in group RD was 264.6± 29.4 min and the difference observed was statistically significant. Mean duration of analgesia was 7.52 ± 2.10 hrs. in group RD and 4.25 ± 1.80 hrs. in group R. This difference of the longer duration of analgesia in Group RD was statistically significant ($p < 0.05$).

**Table 3:** The block characteristics in all the groups

| | Group R | Group RD | t* Value | P Value | Significance |
|---|---|---|---|---|---|
| | Mean ± SD (Minutes) | Mean ± SD (Minutes) | | | |
| Onset of sensory block | 8.76 ± 2.97 | 8.23 ± 2.91 | 0.79178 | 0.4317 | Not significant |
| Onset of motor block | 11.8±2.52 | 8.97±2.54 | 4.33433 | 0.000 | Significant |
| Duration of sensory block | 169.13± 30.98 | 191.03± 32.97 | 2.65132 | 0.0103 | Significant |
| Duration of motor block | 216 ± 33 | 264.6 ± 29.4 | 6.01664 | 0.000 | Significant |
| Duration of analgesia (hrs.) | 4.25 ± 1.80 | 7.52 ± 2.10 | | < 0.05 | Significant |

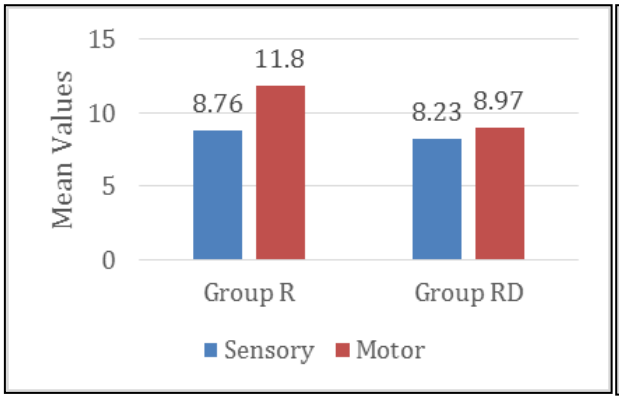


**Fig 2:** Onset time of sensory and motor blockade

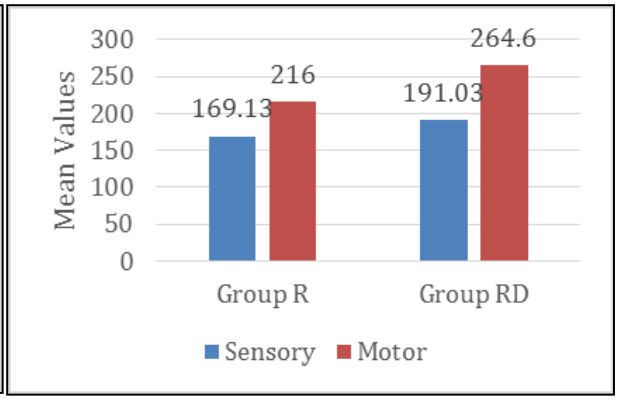


**Fig 3:** Duration of sensory and motor blockade

The haemodynamic parameter variations between the 2 groups were compared by General Linear Model for repeated measures. The test for heart rate showed significant difference with $p < 0.001$. It was also seen that the systolic blood pressure in the group R was 129.33±2.29 mm of Hg whereas in group RD was 127.53±4.66. Thus the baseline SBP was comparable. Then the fall in the blood pressure was observed in both the groups but the difference observed in fall of SBP at various time intervals was statistically significant. The baseline diastolic BP in group R was 79.59±1.88 and in group RD was 80.20±1.77 and the difference was statistically non significant. Fall in diastolic blood pressure was observed till 45min in group R whereas in group RD fall in DBP was observed till 60 min, then again rise in DBP was observed. There was statistically significant fall in DBP in group RD as compared to group R during 6 to 20 min duration.

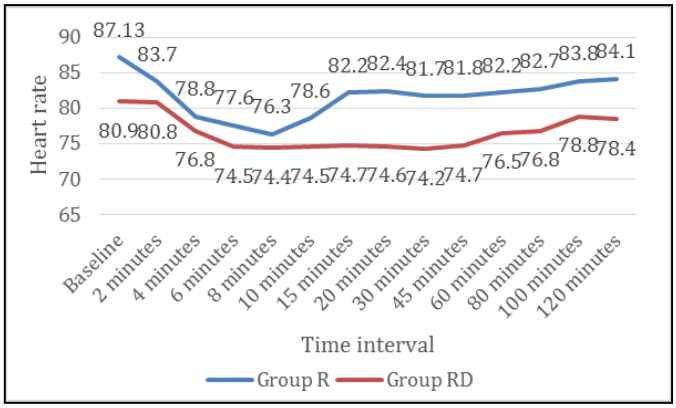


**Fig 4:** Heart Rate

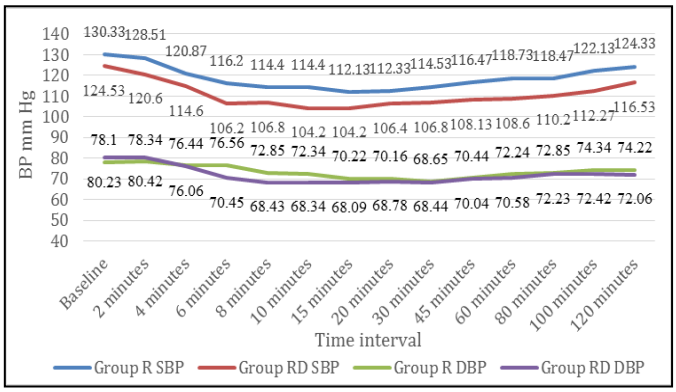


**Fig 5:** Blood Pressure

Hypotension was observed in 4 (13.33%) patients in group RD and in 2 (6.66%) patients of group R. The difference was statistically significant. But they were managed with fluid bolus. Bradycardia was observed in 2 (6.66%) patients from both the groups which were responded well to atropine. Nausea and vomiting was seen in 2 patients from group R and one patient from group RD. Pruritus and shivering was observed in one patient each from group R. None of the patient from group RD had these complications.

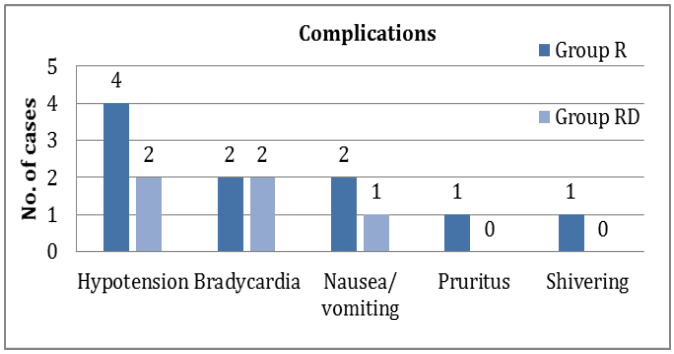


**Fig 6:** Complications

## Discussion

The present study was conducted to compare the effects of isobaric ropivacaine 0.5% with and without dexmedetomidine 5 mcg in spinal anaesthesia in lower limb and perineal surgeries in terms of the onset of sensory and motor block, duration of sensory and motor block, and duration of analgesia. Our study included 60 patients between 25-60 years of either sex with ASA grade I and II posted for elective lower limb and perineal surgeries. Patients were divided into two groups (each of 30 patients) depending upon drugs used as -

Group R: Received 3 ml of isobaric Ropivacaine 0.5% with 0.05 ml of Normal saline.

Group RD: Received 3 ml of isobaric Ropivacaine 0.5% with 0.05 ml of Dexmedetomidine 5 mcg.

In Group R mean age of patient was 44.5±10.2 years and in Group RD it was 45±10 years. Highest age was 60 years and lowest age was 25 years. In Group R 12 patients were male and 18 were female, while in Group RD 11 were male and 19 were female. There was no significant difference ($p>0.05$) of patient's age and sex between both the groups as shown in results. Lower limb surgeries were commonly performed in both the groups i.e., 17 in group R and 18 in group RD. Thus the types of surgeries performed were almost identical in both groups. The demographic data such as age, sex and types of surgeries performed being comparable has no influence on outcome of the study.

The mean time for onset of sensory block in group R was 8.76±2.97 min whereas in group RD was 8.23±2.91 min and the difference observed was not statistically significant.

The mean time of onset of motor block in group R was 11.8±2.52 min whereas in group RD was 8.97±2.54 min and the difference observed was statistically significant.

Archana M, Gangadhar [11] conducted a study to assess the analgesic and hemodynamic effects of intrathecal administration of Ropivacaine 0.75% alone versus Ropivacaine 0.75% with 5 mcg of Dexmedetomidine in elective lower limb orthopedic surgeries. In their study, the onset of sensory bock was 5.17 ± 0.7 minutes for only Ropivacaine group and 4.63 ± 0.61 for Ropivacaine with Dexmedetomidine group. This difference was statistically significant. Shah A *et al.* (2012) [12] studied haemodynamic effects of intrathecal dexmedetomidine added to ropivacaine intraoperatively and for postoperative analgesia. They observed onset of sensory bock for Ropivacaine with Dexmedetomidine was 4.8 ± 1.2 minutes, which was comparable to our study.

In a study by Archana M, Gangadhar [11], the time taken for onset of motor block was 12.87 ± 1.36 minutes for only Ropivacaine group and 11.68 ± 1.24 minutes for Ropivacaine with Dexmedetomidine group. This finding was statistically significant. In study by Alka Shah *et al.* [12], time taken by block to reach maximum level was 11.7 ± 1.7 min. Our findings correlate with these studies.

Various studies have stated Intrathecal small dose of Dexmedetomidine used in combination with Ropivacaine for spinal anaesthesia have been shown to produce a shorter onset of motor block and a prolongation in duration of motor and sensory block. By virtue of its effects on spinal α2 receptors, said benefits are known to occur when used with local anesthetics for neuraxial blocks.

Kosugi T *et al.* [13] examined the effects of dexmedetomidine on compound action potential (CAP) recorded from frog sciatic nerve and found that CAPs were inhibited by α2 adrenoceptor agonist so that they were able to block nerve conduction.

In a study by Atul Kumar Singh (2012-2014) [14], they evaluated the efficacy of two different doses of dexmedetomidine as an adjuvant to isobaric ropivacaine, intrathecally. Time to achieve desired block was least in group with Dexmedetomidine of 5 μg and maximum in group Dexmedetomidine of 10 μg. The sensory-motor blockade remained significantly prolonged in later group with Dexmedetomidine of 10 μg.

Ammar and Mahmoud [15] and Kaygusuz *et al*. [16] in their studies, found significantly earlier onset of sensory block in the RD group than in the group R.

In conclusion, addition of dexmedetomidine prolonged the sensory block significantly when used with isobaric ropivacaine intrathecally in a dose dependant manner.

In our study, mean duration of sensory block was 169.13±30.98 min in group R and 191.03± 32.97 min in group RD and the difference observed in group R and group RD was statistically significant. The mean duration was motor block was also prolonged in group RD than group R (4.41±0.49 hrs. vs. 3.6 ±0.55 hrs. p< 0.001; Highly Significant).

Zhang *et al*. in 2014 also reported prolonged sensory and motor blockade duration in patients who received dexmedetomidine (50 μg) in 40 ml of 0.33% ropivacaine when compared to control group for axillary brachial plexus blockade [17]. However, dexmedetomidine was also associated with an increased incidence of side effects such as bradycardia, hypertension, and hypotension. In a study on sciatic nerve block in rats, addition of dexmedetomidine to ropivacaine resulted in increased duration of sensory and motor block and showed no evidence of neurotoxicity [18].

Kathuria S *et al*. [19] assessed the effect of dexmedetomidine as an adjuvant to ropivacaine in supraclavicular brachial plexus block. They have found that addition of dexmedetomidine (50 μg) to 30 ml ropivacaine 0.5% in ultrasound-guided supraclavicular brachial plexus block resulted in a quick onset of sensory and motor block, prolonged duration of both sensory and motor block.

In another study by Rancourt *et al*. [20], adding dexmedetomidine to ropivacaine for posterior tibial nerve block under ultrasound guidance had prolonged duration of sensory blockade. They observed that sensory blocks lasted longer in group RD than in group R [21.5 vs. 16.2 hours; mean pairwise difference 5.3 hours (95% confidence interval: 3.9-6.7 hours); P < 0.0001].

Intrathecal dexmedetomidine when added to isobaric Ropivacaine increases both the quality and the duration of the anaesthesia provided by local anaesthetic. The mechanism by which α2 adrenergic agonists prolong the motor and sensory block of local anesthetics may be an additive or synergistic effect secondary to the different mechanisms of action of local anesthetics. Dexmedetomidine act by binding to the presynaptic C-fibers and postsynaptic dorsal horn neurons. They produce analgesia by depressing the release of C-fiber transmitters and by hyperpolarization of postsynaptic dorsal horn neurons.

Blood pressure and Heart rate were significantly lower in Ropivacaine with Dexmedetomidine group compared to only Ropivacaine group. However, bradycardia and hypotension was comparable at all measured intervals, which reaffirms the established effects of α2 agonists in providing a hemodynamically stable perioperative period. There was no significant difference in the doses of Atropine and fluid bolus given to the patients in both groups, for treating Bradycardia and hypotension respectively.

In a study by Archana M and Gangadhar [11], highest and Lowest Systolic Blood pressure recorded were 115.93±4.83 mmHg and 107.38±3.67 mmHg respectively at 180 minutes and 10 minutes post dosing. In a study by Alka Shah *et al*. [12], highest and Lowest Systolic Blood pressure recorded was 111± 5.74 mm Hg and 94.08 ± 5.80 mm Hg respectively at 1 minutes and 10 minutes post dosing.

Kaur S *et al*. [21] compared the hemodynamic, sedative and analgesia potentiating effects of epidurally administered dexmedetomidine when combined with ropivacaine. Epidural anesthesia was given with 150 mg of 0.75% ropivacaine in Group A (n = 50) and 150 mg of 0.75% ropivacaine with dexmedetomidine (1 μg/kg) in Group B (n = 50). They observed that hemodynamic parameters remained stable at all measured intervals and were comparable in both the groups. Only 2 (4%) patients in Group A and 5 (10%) patients in Group B had Bradycardia during first 40 min and was treated by giving injection atropine 0.6 mg intravenously. Later on heart rate remained stable in both the groups. Among 50 patients, 2 (4%) patients in Group A and 4 (8%) patients in Group B had fall in blood pressure (SBP <90 mm of Hg) during first 40 min interval which was corrected by giving oxygen and intravenous fluids. Only 1 (2%) patient in Group A and 3 (6%) patients in Group B required injection ephedrine hydrochloride intravenously and the dose difference was not statistically significant (P> 0.05). Ephedrine was given as 5 mg bolus and repeated according to blood pressure and total Ephedrine given in Group A was 10 mg and in Group B was 15 mg. Later on blood pressure remained stable at all measured intervals.

In a study of Chinappa *et al*. [22], the hemodynamic variables were comparable between the two groups during the study intervals except that intraoperatively four patients in dexmedetomidine group developed hypotension (13%), which was managed with a fluid bolus, and one patient had bradycardia (3%), which was managed by awakening the patient. There was statistically significant difference between the two groups in the incidence of these side effects (P< 0.001).

The higher incidence of bradycardia and hypotension in dexmedetomidine group was a problem that cannot be ignored. There was no significant clinical impact, and they could be easily managed. Bradycardia and hypotension are potentially life threatening, and if not detected in time, there can be dangerous consequences. Thus, when dexmedetomidine is being used as an adjuvant to ropivacaine, monitoring of the patient in a high dependency area is required at least for 24 h.

In a study by Das A *et al*. [23], intra-operative hemodynamic parameters were significantly lower in group RD (P< 0.05) without any appreciable side-effects.

In present study, mean duration of analgesia was 7.52 ± 2.10 hours in group RD and 4.25 ± 1.80 hours in group R. This difference of the longer duration of analgesia in Group RD was statistically significant (p< 0.05).

Several hypothesized mechanisms of action have been suggested to explain the analgesic effect of dexmedetomidine.

Some of these include vasoconstriction around the injection site, direct suppression of impulse propagation through neurons as a result of a complex interaction with axonal ion channels or receptors, local release of enkephalin-like substances, a decrease in localized pro-inflammatory mediators and an increase in anti- inflammatory cytokines through a α2-adrenoceptor-mediated mechanism.

Paul *et al*. (2010) [24] studied the efficacy of intra-articular dexmedetomidine for postoperative analgesia in arthroscopic knee surgery in 60 patients, who were randomly assigned to two groups of 30 each. Group R received 19 ml of 0.25% ropivacaine and 1 ml of isotonic saline (total volume 20 ml) intra-articularly. Group RD received 100 µg (1 ml) of dexmedetomidine added to 19 ml of 0.25% ropivacaine intra-articularly (total volume 20 ml). Analgesic effect was evaluated by measuring pain intensity (VAS score) and duration of analgesia was obtained. They found that the duration of analgesia was 5.38 ± 1.4 hrs. and 10.84 ± 2.6 hrs. in Group R and Group RD, respectively. They found that this difference of the longer duration of analgesia in Group RD was statistically significant (P< 0.001). They also found that in Group RD the consumption of fentanyl in the postoperative period was low and statistically significant (P< 0.01).

Sinha *et al*. (2012) [25] did a comparative study of the analgesic efficacy of ropivacaine with ropivacaine plus dexmedetomidine for a paravertebral block in unilateral renal surgery in 60 adult patients belonging to either ASA Group I or II. Group I received 18 ml of ropivacaine for 0.25% and Group II received 18 ml of ropivacaine for 0.25% plus 1 µg/kg dexmedetomidine. They found that the mean duration of analgesia was longer in Group II (324.4 ± 56.35 min) as compared to Group I (149.2 ± 30.64 min) and statistically significant (P< 0.05).

Bhat *et al*. (2013) [26] studied the efficacy and safety of ropivacaine with bupivacaine intrathecally for lower abdominal and lower limb surgeries. 70 patients aged between 18 to 65 years were randomized into two groups, n = 35 in each group. Group a received 3 ml of (0.5%) isobaric bupivacaine (15 mg) and Group B 3 ml of (0.75%) isobaric ropivacaine (22.5 mg). Spinal anesthesia procedure was standardized. Haemodynamic parameters, onset and duration of sensory and motor blockade, level achieved, regression and side effects were compared between the two groups. Onset and regression of sensory blockade in ropivacaine group was faster with a P< 0.001 which was statistically significant. Onset of motor blockade was rapid in both the groups but duration of motor blockade was significantly shorter in ropivacaine group. Excellent analgesia, with no side effects and stable haemodynamics was noted in ropivacaine group. They concluded that ropivacaine was safe and equally effective as bupivacaine for lower abdominal and lower limb surgeries with early motor recovery, providing early ambulation.

Yoshitomi *et al*. [27] demonstrated that dexmedetomidine enhanced the local anesthetic action of local anaesthetics via peripheral α-2A adrenoceptors.

In present study, hypotension was observed in 4 (13.33%) patients in group RD and in 2 (6.66%) patients of group R. The difference was statistically significant. But they were managed with fluid bolus. Bradycardia was observed in 2 (6.66%) patients from both the groups which were responded well to atropine. Nausea and vomiting was seen in 2 patients from group R and one patient from group RD. Pruritus and shivering was observed in one patient each from group R. None of the patient from group RD had these complications. The lack of complications such as pruritus, shivering and respiratory depression make dexmedetomidine an attractive choice as an adjuvant for the block.

Kaur S *et al*. [21] compared the hemodynamic, sedative and analgesia potentiating effects of epidurally administered dexmedetomidine when combined with ropivacaine. Epidural anesthesia was given with 150 mg of 0.75% ropivacaine in Group A (n = 50) and 150 mg of 0.75% ropivacaine with dexmedetomidine (1 µg/kg) in Group B (n = 50). In their study, none of the patients had respiratory depression, pruritus, dry mouth, headache or backache in both groups in the postoperative period.

Kamal M *et al*. [28] compared the analgesic effects and side effects of dexmedetomidine added to ropivacaine in pediatric patients undergoing lower abdominal surgeries. They observed that 10% patients in Group R and 6.66% patients in Group RD had vomiting. About 6.66% patients in both groups had clinically significant hypotension, which responded well to fluid bolus. None of the patients in both the groups had clinically significant bradycardia, desaturation, or respiratory depression and urinary retention.

## Conclusion

We conclude that Dexmedetomidine as an adjunct to 0.5% Ropivacaine is superior to 0.5% Ropivacaine alone in spinal anaesthesia. It augments the onset and duration of sensory and motor block, as well as total duration of analgesia thus, reducing the requirement of analgesics in postoperative period. Even though it may cause alterations in haemodynamic parameters. The lack of complications like pruritus, shivering and respiratory depression make it an attractive choice. Thus, it is a safe modality for lower limb and lower abdominal surgeries as far as intraoperative and postoperative analgesia is concerned.

## References


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