Section: Anaesthesia

Original Research Article

EFFECT OF ADDITION OF DEXMEDETOMEDINE (10 MICROGRAMS) TO INJ.ROPIVACAINE 0.75%(H) IN SUB ARACHANOID BLOCK: A COMPARITIVE STUDY

Kadali Lakshmi Sudha[1], Harshwardhan Tikle[2], Hrishikesh Hemant Sarnobat[3], Deepa K[4]

[1]*Junior Resident, Department of Anaesthesia, TNMC & BYL Nair Hospital, Mumbai Central, Mumbai, India.*
[2]*Associate Professor, Department of Anaesthesia, TNMC & BYL Nair Hospital, Mumbai Central, Mumbai, India.*
[3,4]*Junior Resident, Department of Anaesthesia, TNMC & BYL Nair Hospital, Mumbai Central, Mumbai, India.*

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Corresponding Author:
Dr. Kadali Lakshmi Sudha,
Junior Resident, Department of Anaesthesia, TNMC & BYL Nair Hospital, Mumbai Central, Mumbai, India.
Email: lskadali18@gmail.com

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ABSTRACT

Background: Subarachnoid block using ropivacaine is commonly employed for lower abdominal and lower limb surgeries due to its favourable safety profile and reduced cardiotoxicity. The use of adjuvants such as dexmedetomidine has been shown to enhance the quality of spinal anaesthesia by prolonging the duration of sensory and motor blockade and improving postoperative analgesia.
Aims: To evaluate the effect of adding dexmedetomidine (10 micrograms) to intrathecal ropivacaine 0.75% heavy, on sensory and motor block characteristics, duration of postoperative analgesia, and intraoperative hemodynamic parameters, and to compare it with ropivacaine 0.75% heavy alone.
Materials and Methods: This was a prospective, comparative observational study conducted in a tertiary care hospital in Mumbai after approval from the Institutional Ethics Committee. A total of 74 patients scheduled for elective surgeries under subarachnoid block were enrolled after obtaining written informed consent. Patients were randomly allocated into two groups of 37 each. Group 1 received intrathecal Inj.ropivacaine 0.75% heavy alone, while Group 2 received intrathecal Inj.ropivacaine 0.75% heavy with 10 micrograms Inj. Dexmedetomidine. Sensory block characteristics, motor blockade (Modified Bromage Scale), duration of analgesia, and hemodynamic parameters were assessed and statistically analysed.
Results: The addition of 10 micrograms dexmedetomidine to intrathecal Inj.ropivacaine(0.75%) heavy resulted in a significantly prolonged duration of sensory and motor blockade and extended postoperative analgesia compared to Inj. ropivacaine (0.75%) heavy alone. The onset of sensory and motor block was comparable between the two groups. Hemodynamic parameters remained stable in both groups, with no significant increase in adverse effects in the dexmedetomidine group.
Conclusion: Dexmedetomidine 10 micrograms is an effective intrathecal adjuvant to ropivacaine 0.75% heavy for subarachnoid block, providing prolonged sensory and motor blockade and improved analgesia without compromising hemodynamic stability.
Keywords: Dexmedetomidine; Ropivacaine; Subarachnoid block; Spinal anaesthesia; Adjuvant; Motor block.

INTRODUCTION

The administration of medications, typically local anaesthetics, into the subarachnoid space (spinal anaesthesia) or the epidural space (epidural anaesthesia) is called central neuraxial blockade.
A wide range of abdominal and lower extremity procedures can be performed under spinal anaesthesia. Spinal anaesthesia is a preferred option

for these surgeries due to its rapid onset and expedited recovery, leading to reduced hospital stays, lower costs, and earlier resumption of work. Central neuraxial blockade may cause hypotension due to chemical sympathectomy following spinal anaesthesia.

The local anaesthetic administered into the cerebrospinal fluid will induce a motor, sensory, and autonomic blockade, commensurate with the volume of the injected drug. Smaller nerves exhibit greater sensitivity to local anaesthetics owing to their comparatively increased surface area to axon volume ratio. Consequently, the smaller preganglionic sympathetic fibres exhibit greater sensitivity to the effects of local anaesthetics. Differential blockade induces sympathetic blockade, typically occurring two segments or more cephalad to the sensory block (pain, light touch), which is generally several segments more cephalad than the motor blockade.[1]

The spinal cord ends at the inferior margin of the L1 vertebra. Therefore, a spinal anaesthetic is provided below the L1 level to avoid spinal cord damage. Upon the insertion of a spinal needle into the subarachnoid space, a clear and continuous flow of cerebrospinal fluid is noted, followed by the administration of local anaesthetic. A comprehensive blockade of motor, sensory, and autonomic functions is achieved.

The efficacy of a subarachnoid block is dependent upon various factors, including patient-related variables (height, age, gender, position), procedural aspects (patient positioning, epidural injection following spinal administration), and drug-related parameters (dose, concentration, and baricity, among others). All these elements influence the elevation and extent of the barrier. The relationship between drug density and cerebrospinal fluid density is referred to as baricity. Drugs are categorised as hypobaric, isobaric, or hyperbaric based on whether their specific gravity is less than, equal to, or greater than that of cerebrospinal fluid (CSF), respectively. The employment of hyperbaric local anaesthetics is favoured due to their more predictable distribution and the ease of managing cephalad spread.[2]

The most commonly used agents for subarachnoid blockade are amide local anaesthetics, such as bupivacaine. It induces neuraxial blockade by blocking sodium channels on nerve roots exiting the spinal cord, this inhibiting impulse conduction. Bupivacaine and lignocaine are two frequently used local anaesthetics. Lignocaine was previously a prevalent option for spinal anaesthesia to facilitate early ambulation. Nevertheless, its use has been diminished due to the increased incidence of transient neurological symptoms (TNS).[3,4] In the past four years, two novel amide molecules, Ropivacaine and Levo-bupivacaine, have been launched and authorised by the FDA in India. They are members of the amide family and show structural similarities with bupivacaine. These novel compounds are ostensibly less prone to produce LAST, as they consist solely of pure levo-isomers, in contrast to bupivacaine, which is a racemic combination. Ropivacaine was initially used in clinical environments in 1996.[5] The sole structural distinction between ropivacaine and bupivacaine is that the former contains a butyl group on the piperidine nitrogen atom, whilst the latter has a propyl group. It is a levorotatory isomer derivative of bupivacaine. Ropivacaine has a shorter carbon side chain on the tertiary nitrogen atom in comparison to Bupivacaine. The efficacy of ropivacaine is affected by its diminished lipid solubility resulting from its abbreviated carbon chain.[6] This study aims to compare the effects of central neuraxial blockade produced by Inj. Ropivacaine Heavy 0.75% alone with Inj. Ropivacaine Heavy 0.75% along with dexmedetomidine (10 mcg) in lower limb and lower abdomen procedures.

MATERIALS AND METHODS

Study Design: It is a comparative study.

Place of Study: Tertiary care hospital in Mumbai.

Period of Study: The study was carried out over a period of 18 months.

Study Variables: Primary outcome variables included time of onset of sensory block, time taken to reach sensory level T10, maximum height of sensory block, and duration of sensory blockade. Motor block characteristics assessed were time of onset of motor block, degree of motor blockade using the Modified Bromage Scale, and duration of motor blockade. Hemodynamic variables included heart rate and blood pressure changes over time. Postoperative analgesic efficacy was evaluated using Visual Analogue Scale (VAS) scores. These parameters were compared between the ropivacaine alone group and the ropivacaine with dexmedetomidine group to assess anaesthetic efficacy, block characteristics, and analgesic outcomes.

Sample Size: A total of 74 patients were included in the study.

Inclusion Criteria

1) American Society of anaesthesiologists (ASA) Grade I and II.
2) Age between 18-75 years.
3) Patient of either sex.
4) Undergoing lower limb and lower abdominal surgeries (hernias, urological surgeries, lower segment caesarean section etc.)
5) Consent for the procedure.

Exclusion Criteria

1) Upper abdominal surgeries (incision extend above umbilicus) and caesarean sections.
2) Pt on LMWH and heparin therapy.
3) Fixed output cardiac disorders (H O.C.M, M.S, A.S)
4) Pre-existing neurological conditions or surgeries which are waxing and waning in nature (eg: multiple sclerosis, poliomyelitis).
5) Refusal to consent for the procedure.
6) Allergic to any component of the drug or additives.

Statistical Analysis

Data were entered and analysed using SPSS version 25.0. Continuous variables were expressed as mean ± standard deviation, and categorical variables as frequencies and percentages. The prevalence of refractive errors was calculated, and associations with screen time and other risk factors were assessed using chi-square tests for categorical variables and independent t-tests or ANOVA for continuous variables. Correlation between screen time and severity of refractive errors was evaluated using Pearson's correlation coefficient. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic and Baseline Characteristics of Two Study Groups

	Mean (± std dev.)	
Group	**1**	**2**
Age (Years)	39 (±14.5)	41.6 (±14.3)
Height (Cms)	162 (±8.55)	162 (±7.86)
Weight (Kgs)	58.9(±8.55)	59.3 (±8.25)

Table 2: Comparison of Sensory Block Characteristics and Motor Block Onset Between Groups

	Group		
Max. Height of Sensory Block	**Group**	**1**	**2**
	T6	9(12.2%)	12(16.2%)
	T8	5(6.8%)	4(5.4%)
	T10	23(31.1%)	21(28.37%)
Duration	120-150	20	0
	150-180	16	2
	180-210	1	35
Time of Onset of Motor Block (Min) Time (Min)	2	7	5
	3	15	14
	4	11	14
	5	4	4
Time Taken to Reach Sensory Level T10 (Min) Time (Min)	4	18(-24.7%)	19(-26%)
	5	12(-16.4%)	10(-13.7%)
	6	5(-6.8%)	5(-6.8%)
	7	2(-2.7%)	2(-2.7%)
Time of Onset of Sensory Block (Min)	1	17	13
	2	14	17
	3	4	4
	4	2	3

Table 3: Comparison of Motor Blockade Using the Bromage Scale in Two Treatment Groups

		Motor Blockade- Modified Broamge Scale			
Time	**Group**	**1 (37)**		**2 (37)**	
		Counts	**% of Total**	**Counts**	**% of Total**
After 0 Min	0	37	50.00%	37	50.00%
After 2 Min	0	6	8.10%	4	5.40%
	1	25	33.80%	27	36.50%
	2	6	8.10%	6	8.10%
After 4 Min	2	34	45.90%	31	41.90%
	3	3	4.10%	6	8.10%
After 8 Min	3	37	50.00%	37	50.00%

Table 4: Comparison of Motor Block Characteristics Between Two Groups

Independent Samples T-Test					
		Statistic	**df**	**p**	**Significance**
Time of Onset of Motor Block (Min)	**Student's t**	-0.652	72	0.517	Not Significant
Duration of Motor Blockade (Min)	**Student's t**	-14.81	72	< .001	Significant

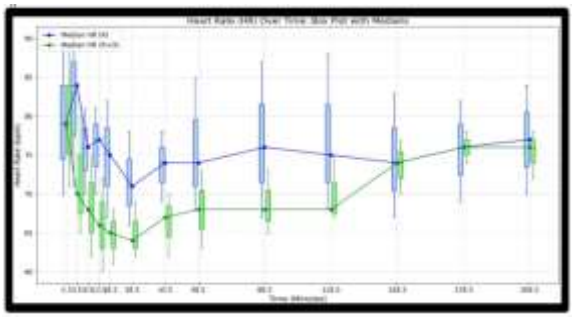

Figure 1: Heart Rate Changes Over Time in Two Groups

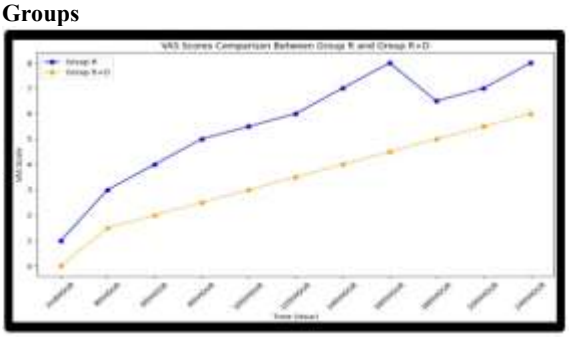

Figure 2: VAS Scores: Ropivacaine vs. Ropivacaine + Dexmedetomidine

The demographic characteristics of the two study groups were comparable. The mean age in Group 1 was 39 ± 14.5 years, while in Group 2 it was 41.6 ± 14.3 years, indicating similar age distribution between the groups. The mean height was identical in both groups, measuring 162 ± 8.55 cm in Group 1 and 162 ± 7.86 cm in Group 2.

The mean body weight was also comparable, with Group 1 having a mean weight of 58.9 ± 8.55 kg and Group 2 having 59.3 ± 8.25 kg. These findings indicate that both groups were well matched with respect to age, height, and weight, ensuring baseline comparability and minimizing demographic confounding in outcome assessment.

The maximum height of sensory block achieved varied between the two groups. In Group 1, the most common sensory level attained was T10, observed in 23 patients, followed by T6 in 9 patients and T8 in 5 patients. Similarly, in Group 2, T10 was the most frequently achieved level in 21 patients, followed by T6 in 12 patients and T8 in 4 patients, indicating comparable sensory block spread between the two groups.

Regarding the duration of sensory block, Group 1 predominantly showed a duration between 120–150 minutes in 20 patients and 150–180 minutes in 16 patients, with only 1 patient experiencing a duration of 180–210 minutes. In contrast, Group 2 demonstrated a longer duration of sensory block, with 35 patients having a duration of 180–210 minutes, while only 2 patients showed a duration between 150–180 minutes, indicating prolonged sensory blockade in Group 2.

The time to onset of motor block showed comparable distribution in both groups. In Group 1, motor block onset occurred at 3 minutes in 15 patients, 4 minutes in 11 patients, and 2 minutes in 7 patients, while fewer patients showed onset at 5 minutes. In Group 2, onset was most commonly observed at 3 and 4 minutes, each in 14 patients, followed by 2 minutes in 5 patients, demonstrating a similar onset pattern between groups.

The time taken to reach sensory level T10 was comparable in both groups. In Group 1, most patients achieved T10 at 4 minutes (18 patients) and 5 minutes (12 patients), while fewer patients required 6 or 7 minutes. A similar trend was observed in Group 2, with the majority reaching T10 at 4 minutes (19 patients) and 5 minutes (10 patients).

The onset of sensory block was rapid in both groups. In Group 1, sensory block onset occurred at 1 minute in 17 patients, 2 minutes in 14 patients, and 3 minutes in 4 patients, while in Group 2, onset was seen at 1 minute in 13 patients and 2 minutes in 17 patients, indicating early onset of sensory anesthesia in both groups.

Motor blockade was assessed at predefined time intervals using the Modified Bromage Scale in both study groups. At baseline (0 minutes), all patients in Group 1 and Group 2 had a Bromage score of 0, indicating absence of motor block in both groups.

At 2 minutes, partial motor blockade was observed. In Group 1, 25 patients (33.8%) achieved Bromage score 1, while 6 patients (8.1%) reached score 2; 6 patients (8.1%) remained at score 0. In Group 2, 27 patients (36.5%) achieved Bromage score 1, 6 patients (8.1%) reached score 2, and 4 patients (5.4%) remained without motor block, demonstrating comparable early motor block onset.

At 4 minutes, progression of motor blockade was evident. In Group 1, 34 patients (45.9%) attained Bromage score 2, while 3 patients (4.1%) achieved complete motor block (score 3). In Group 2, 31 patients (41.9%) reached score 2 and 6 patients (8.1%) achieved score 3, indicating a slightly faster progression to complete motor blockade in Group 2.

By 8 minutes, all patients in both groups achieved Bromage score 3, indicating complete motor blockade in 100% of patients.

Independent sample t-test analysis was performed to compare motor block characteristics between the two study groups. The time of onset of motor block did not show a statistically significant difference between Group 1 and Group 2 ($t = -0.652$, $df = 72$, $p = 0.517$), indicating that the addition of dexmedetomidine did not significantly affect the onset of motor blockade.

In contrast, the duration of motor blockade was significantly prolonged in Group 2 compared to Group 1. This difference was found to be highly statistically significant ($t = -14.81$, $df = 72$, $p < 0.001$), demonstrating that the addition of dexmedetomidine to intrathecal ropivacaine resulted in a longer duration of motor blockade.

The results of independent samples t-tests comparing heart rate between two groups ("1" and "2") at various time points (5 to 210 minutes). The goal is to determine if there's a statistically significant difference in HR between the groups at each time point.

DISCUSSION

A hospital based prospective, randomized comparative study was done with 74 patients to compare the characteristics of central neuraxial blockade induced by Inj. Ropivacaine Heavy 0.75% alone and Inj. Ropivacaine Heavy 0.75% along with Dexmeditomedine 10mcg in lower limb and lower abdominal surgeries.

The patients were randomly divided into following groups-

Group 1: Ropivacaine alone = 37 patients

Group 2: Ropivacaine + Dexmedetomidine = 37 patients

Group 1 received 3.2ml of 0.75% heavy Ropivacaine (n=37) and Group 2 received 3.2ml of 0.75% heavy Ropivacaine plus 10 micrograms of inj. Dexmeditomedine intrathecally for lower limb and lower abdominal surgery.

Both the groups were comparable in their demographic profile for age 39 (±14.5), height and 162 (±8.55) and weight 58.9(±8.55) in Group 1 and 41.6 (±14.3), 162 (±7.86), 59.3 (±8.25) respectively in Group 2.

Both groups had almost similar SAB characteristicsi.e. onset of sensory block within 2 minutes, maximum cephalad spread up to T6 dermatome and time taken to achieve T10 dermatome level. There was significant difference in the duration of sensory and motor block in both the groups which was statistically more significant in Group 2 when compared to Group 1 with P<0.001. The duration of Sensory block was (143± 16.8) minutes in Group 1 compared to (198± 14.9) minutes in Group 2. In both groups the modified bromage score of 3 was reached in 8 minutes in all the patients and there was no statistically significant difference in the groups.

The onset of motor block was between 3 to 4 minutes in both the groups 26/37 and 28/37 patients respectively in group 1 and group 2. The mean onset time in Group 1 was 3.32 (±0.91) minutes and in Group2 it was 3.46 (±0.86) minutes. Addition of Dexmeditomedine to ropivacaine significantly increased the duration of Motor block in group 2 which was 164 (±13.6) minutes compared to 106 (±19.5) minutes in group 1. Our study confirmed that ropivacaine has unique sensory motor differentiation and addition of adjuvant like Dexmeditomedine only enhances this differentiation.

Shah, Patel, and Gandhi (2017),[7] conducted a study evaluating the hemodynamic effects and analgesic efficacy of combining dexmedetomidine 5 mcg with 4 ml isobaric 0.75% ropivacaine for lower abdominal and lower limb surgery. They found that the addition of 5 mcg dexmedetomidine to 0.75% ropivacaine resulted in stable systolic (Range 106-111 mm Hg) and diastolic blood pressures (Range 72-74 mm Hg) and Heart rate (Range 82-94 bpm) during surgery, which is crucial for patient safety during lower limb and abdominal procedures. The study also demonstrated that patients experienced prolonged postoperative analgesia, reducing the need for additional analgesics like diclofenac in the first 24 hours post-surgery. They also reported the time to rescue analgesia as 478.5 ± 20.9 mins.

In our study, the patients who received intrathecal 10mcg dexmedetomidine with ropivacaine had prolonged sensory and motor block. The time for rescue analgesia in the ropivacaine with dexmedetomidine (Group 2) was 14 hours compared to 6 hours in the ropivacaine group (Group1), which is statistically significant(p<0.001). Both groups had stable hemodynamic profiles throughout the procedure. Even though the patients who received dexmedetomidine had a significant drop in their diastolic blood pressure and heart rate during surgery, it was not clinically significant to warrant any medical intervention for stabilization. Also, the patient had prolonged analgesia postoperatively.

The above findings were corroborated in the study by Dolma et al. (2018).[8] In their study, the combination of isobaric ropivacaine with dexmedetomidine 5mcg for the subarachnoid block in neck of femur fracture surgeries demonstrated a significant prolongation of sensory blockade (Ropivacaine vs Ropivacaine with 5mcg dexmedetomidine was 157 ± 31.6 mins vs 202.90 ± 50.2 mins respectively) and motor blockade compared to ropivacaine alone.

In our study also, there is significant prolongation in duration of sensory block, which was (143± 16.8) minutes in Group 1 compared to (198± 14.9) minutes in Group 2. Addition of intrathecal Dexmeditomedine 10mcg to ropivacaine significantly increased the duration of Motor block in group 2 which was 164 (13.6) minutes compared to 106 (19.5) minutes in group 1.

Their results show that dexmedetomidine provides better overall anaesthesia quality without causing significant hemodynamic instability. In our study, the systolic and diastolic blood pressure remained stable and comparable and within the acceptable clinical range. There was significant drop in the heart rate in patients who received dexmeditomedine within 5 minutes of the period and remained so for most of the time, but this was not clinically significant to warrant any medical intervention.

They also reported a significantly longer time for rescue analgesia request in the ropivacaine with dexmedetomidine group (265.16±71.4 mins) compared to ropivacaine alone (203.67 ± 35.5 mins) with a p-value <0.001. In our study, the VAS of 4 or more was achieved at 6 hours after the block in group 1 and in group 2, it was achieved by 12 hours (p<0.001). The extended duration of analgesia is particularly advantageous in prolonged surgeries, reducing the need for additional anaesthetic interventions.

The study by Parmar et al. (2014),[9] was conducted to evaluate the effect and safety of intrathecal dexmedetomidine (5 mcg) added to isobaric ropivacaine in subarachnoid blocks in 120 patients, who underwent vaginal hysterectomies. Their study revealed that adding dexmedetomidine to intrathecal

ropivacaine significantly extended the duration of sensory and motor blockades, similar to the effects observed with bupivacaine. Duration of onset of sensory block upto T10, T8 and the highest level of block achieved i.e. T6 were similar in both the groups. Similiar findings were observed in our study, the maximum height achieved is T6 in both groups, which was reached by 12 patients (16.2%) in group 2 and 9 patients (12.2%) in group 1.

The mean time of sensory regression to S2 was 297.71±34.11 min in group D and 221.35±22.70 min in group R. Time to achieve Bromage score 0 was significantly slower with the addition of dexmedetomidine (229.37±28.74 min in group R vs. 258.55±30.46 min in group D). These findings were also similar to our study in which the duration of sensory and motor blockade were significantly prolonged with p value <0.001, as stated above.

Duration of postoperative analgesia was significantly greater in group D (270.00±38.75 min) as compared to group R (174.77±22.31 min) in their study. The maximum VAS score for pain was less in group D (4.42±0.69) as compared to group R (7.03±0.78). There was no significant difference in hemodynamic parameters and incidence of side effects in both the groups. This study also highlighted the benefits of dexmedetomidine in postoperative pain control. These findings are similar to our current study, as stated above, which also demonstrates the beneficial effects of adding dexmedetomidine to ropivacaine to enhance the local analgesic potency and prolong the post-operative analgesia.

The study by Gupta M, Gupta P, Singh DK.[10] Effect of 3 Different Doses of Intrathecal Dexmedetomidine (2.5µg, 5µg, and 10 µg) on 90 patients undergoing elective lower abdominal and lower limb surgeries , showed that there was a significant and dose-dependent prolongation of the duration of sensory block (127.50, 149.17, and 187.50 minutes; P < 0.001), motor block (258.50, 331, and 365 minutes; P < 0.001), analgesia (306.17, 396.50, and 512 minutes; P < 0.001), and duration of postoperative analgesia (47.67, 65.50, and147 minutes; P< 0.001) in groups 2.5mcg,5mcg and 10mcg of intrathecal dexmeditomedine respectively. The group with intrathecal dexmeditomedine 10 mcg, required significantly fewer rescue analgesics compared with other 2 groups (P = 0.001). All these findings are similar to those of our study where there was significant difference in VAS scores across the period of 2 to 16 hours post operatively (p < .001 for most time points).

The systematic review and meta-analysis by Wu et al. (2014),[11] covering 16 randomised control trials, where dexmedetomidine was used as local anaesthetic adjuvant, they found that central neuraxial administration of dexmeditomedine leads to decreased postoperative pain (SMD,21.29; 95%confidence interval (CI),21.70to20.89; P,0.00001), prolonged analgesia, increased bradycardia (OR,2.68;95%CI,1.18to6.10; P=0.02). It was associated with beneficial alterations in post-operative sedation scores, number of analgesic requirements, sensory and motor block characteristics, and intraoperative hemodynamics. All these findings have been corroborated in our study results, where VAS of 4 or more was achieved at 6 hours after the block in group 1 and in group 2, it was achieved by 12 hours. There was significant drop in the heart rate in patients who received dexmeditomedine, within 5 minutes of the period and remained so for most of the time, but this was not clinically significant to warrant any medical intervention.

Mahmoud et al. (2009),[11] conducted a study in 66 pts, randomly assigned into 3 groups, each receiving spinal bupivacaine 12.5mg combined with normal saline (group N) Dexmedetomidine 5µg (group D5), or dexmedetomidine 10µg (group D10). The mean time of sensory block to reach the T10 dermatome was 4.7±2.0 minutes in D10 group, 6.3±2.7 minutes in D5, and 9.5±3.0 minutes in group N. In our study, time taken to reach T10 level is similar in both the groups, majority i.e, 18 out of 37 participants in Group 1 and 19 out of 37 in Group 2, achieved the sensory block at T10 within 4 minutes.

The regression time to reach S1 dermatome was 338.9±44.8 minutes in group D10, 277.1±23.2 minutes in D5, and 165.5±32.9 minutes in group N. The mean time to reach Bromage 3 scale was 10.4±3.4 minutes in group D10, 13.0±3.4 minutes in D5, and 18.0±3.3 minutes in group

N. The regression to Bromage 0 was 302.9±36.7 minutes in D10, 246.4±25.7 minutes in D5, and 140.1±32.3 minutes in group N. Onset and regression of sensory and motor block were highly significant (N vesus D5, N versus D10, and D5 versus D10, p<0.001.[11]

Our study revealed no statistically significant difference in the time to onset of sensory block (p = 0.430) and motor block (p = 0.517) between the two groups, which suggests that both groups experienced a similar speed of onset for the sensory and motor block. But, Group 2 exhibited a substantially longer duration of sensory block (198.11 minutes vs. 143.24 minutes) (p<0.001) and motor block (163.78 minutes vs. 105.95 minutes) (p<0.001) compared to Group 1, which are statistically significant.

The hemodynamic parameters were also comparable in both the groups throughout the study period. The systolic and diastolic blood pressure remained stable and comparable and within the acceptable clinical range. There was significant drop in the heart rate in patients who received dexmeditomedine within 5 minutes of the period and remained so for most of the time, but this was not clinically significant to warrant any medical intervention.

CONCLUSION

The use of dexmedetomidine (10 micrograms) into 0.75% hyperbaric ropivacaine for subarachnoid block markedly improves the quality and duration of

spinal anaesthesia. Dexmedetomidine extended the duration of sensory and motor blockade and offered enhanced postoperative analgesia relative to ropivacaine alone. Patients administered with dexmedetomidine and ropivacaine in subarachanoid block had a decreased need for rescue analgesics with intraoperative haemodynamic stability, with no notable rise in side effects. Consequently, dexmedetomidine serves as a secure and efficacious adjunct to intrathecal ropivacaine, providing extended analgesia and enhanced patient comfort, thereby constituting a significant alternative adjuvant for local anaesthetics in spinal anaesthesia in lower abdominal and lower limb surgeries.

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