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ORIGINAL ARTICLE

Assessment of intrathecal dexmedetomidine as adjuvant for spinal anaesthesia for perianal ambulatory surgeries

Dr Bishun Choudhary

Assistant professor, Department of Anaesthesia, Career Institute of Medical Sciences and Hospital, Lucknow, Uttar Pradesh, India

ABSTRACT:

Background: Anorectal disease is one of the most common problems in ambulatory surgery. Surgery is the best therapy for chronic anal fissure, fistula in ano, third and fourth degree hemorrhoids. The present study was conducted to assess intrathecal dexmedetomidine as adjuvant for spinal anaesthesia for perianal ambulatory surgeries. **Materials & Methods:** 60 adult patients of American Society of Anaesthesiologists physical status I and II presenting for perianal surgeries were divided into 2 groups. Group I patients received intrathecal 0.5% hyperbaric bupivacaine 6 mg (1.2 ml) with injection dexmedetomidine 5 µg in 0.5 ml of normal saline and group II received intrathecal 0.5% hyperbaric bupivacaine 6 mg (1.2 ml) with 0.5 ml of normal saline. **Results:** The mean weight in group I was 64.5 kg and in group II was 63.1 kg, height was 156.2 cm in group I and 158.3 cm in group II, ASA grade I was 35 and II was 25 in group I and I in 30 and II in 30 in group II. The mean duration of surgery was 26.1 minutes in group I and 28.4 minutes in group II. The mean duration of sensory block in group I was 432.4 minutes and in group II was 310.2 minutes, duration of motor block was 324.6 minutes in group I and 216.4 minutes in group II and time to ambulation was 310.2 minutes in group I and 210.4 minutes in group II. The difference was significant (P< 0.05). **Conclusion:** Intrathecal dexmedetomidine 5 µg added to intrathecal bupivacaine 6 mg as adjuvant may not be suitable for ambulatory perianal surgeries due to prolongation of motor blockade.

Key words: Intrathecal dexmedetomidine, spinal anaesthesia, perianal ambulatory surgeries.

Corresponding author: Dr Bishun Choudhary, Assistant professor, Department of Anaesthesia, Career Institute of Medical Sciences and Hospital, Lucknow, Uttar Pradesh, India

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INTRODUCTION

Anorectal disease is one of the most common problems in ambulatory surgery.[1] Surgery is the best therapy for chronic anal fissure, fistula in ano, third and fourth degree hemorrhoids. Since most patients are anxious about pain during and after the surgery, adequate pain control is the key success factor in all surgical settings including the ambulatory anorectal surgery.[2]

Many surgical procedures for anorectal diseases can be performed in the ambulatory or outpatient basis. Potential advantages of outpatient surgery include more rapid return to the comforts of home environment, diminished opportunities for nosocomial infection, and increased available beds for more complex surgery.[3] Moreover, the cost of outpatient surgery is much less than inpatient surgery. A great variety of anorectal diseases including hemorrhoids, fissures, fistulas and various miscellaneous conditions have been shown to be amenable to surgery on a day-case regimen.[4]

Dexmedetomidine is a selective α2 -adrenergic receptor agonist (α2 -AR agonist). Dexmedetomidine has been found to prolong analgesia when used as an adjuvant to local anaesthetics for subarachnoid block.[5] Analgesic action of α2 -AR agonists is a result of depression of the release of presynaptic C-fibre transmitters and by hyperpolarisation of postsynaptic dorsal horn neurons. Dexmedetomidine is an α2 -AR agonist which is 8–10 times more potent than clonidine. But studies of intrathecal dexmedetomidine for ambulatory surgeries are sparse.[6] The present study was conducted to assess intrathecal dexmedetomidine as adjuvant for spinal anaesthesia for perianal ambulatory surgeries.

MATERIALS & METHODS

The present study was conducted among 60 adult patients of American Society of Anaesthesiologists physical status I and II presenting for perianal surgeries of both genders.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Group I patients received intrathecal 0.5% hyperbaric bupivacaine 6 mg (1.2 ml) with injection dexmedetomidine 5 µg in 0.5 ml of normal saline and group II received intrathecal 0.5% hyperbaric bupivacaine 6 mg (1.2 ml) with 0.5 ml of normal saline. The parameters assessed were time to regression of sensory blockade, motor blockade, ambulation, time to void, first administration of analgesic. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Demographic profile

Parameters	Group I	Group II	P value
Weight (Kg)	64.5	63.1	0.12
Height (cm)	156.2	158.3	0.15
ASA (I/II)	35:25	30:30	0.09
Duration of surgery (min)	26.1	28.4	0.05

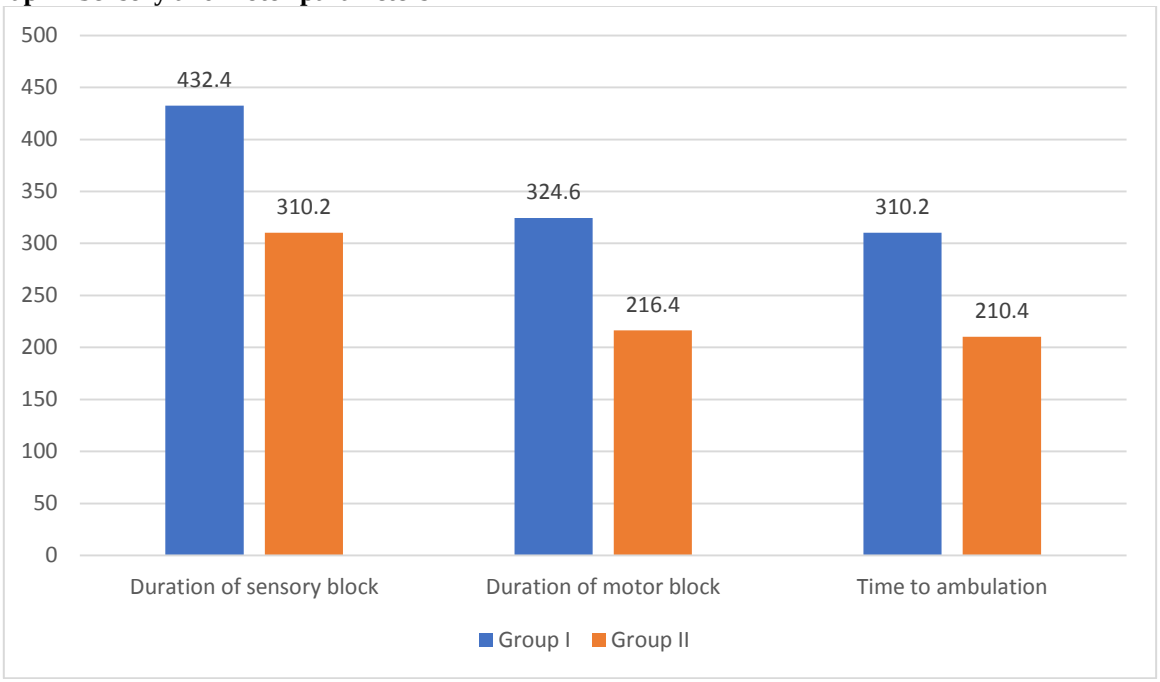
Table I shows that mean weight in group I was 64.5 kg and in group II was 63.1 kg, height was 156.2 cm in group I and 158.3 cm in group II, ASA grade I was 35 and II was 25 in group I and I in 30 and II in 30 in group II. The mean duration of surgery was 26.1 minutes in group I and 28.4 minutes in group II. The difference was significant (P< 0.05).

Table II Sensory and motor parameters

Parameters (min)	Group I	Group II	P value
Duration of sensory block	432.4	310.2	0.01
Duration of motor block	324.6	216.4	0.02
Time to ambulation	310.2	210.4	0.05

Table II, graph I shows that mean duration of sensory block in group I was 432.4 minutes and in group II was 310.2 minutes, duration of motor block was 324.6 minutes in group I and 216.4 minutes in group II and time to ambulation was 310.2 minutes in group I and 210.4 minutes in group II. The difference was significant (P< 0.05).

Graph I Sensory and motor parameters



DISCUSSION

Adequate intra-operative and postoperative pain control is the key of success in the ambulatory anorectal surgery. Perianal infiltration of local anesthetics is an effective method of pain control that can be easily performed by the surgeons. A short-acting local anesthetic such as lidocaine provides excellent initial pain relief.[7] A long-acting local anesthetic such as bupivacaine provides several hours of anesthesia postoperatively and allows for the patient's immediate discharge at the end of surgery. Adrenaline mixed into these anesthetics promotes vasoconstriction, which reduces bleeding in the operative field. Moreover, perianal anesthetics infiltration permits the use of a safe jack knife position, resulting in a technically easy surgical setting.[8]

Smith[9] recommended that 90% of anorectal surgeries could be carried out on ambulatory basis. The newer trend in regional anaesthesia for ambulatory anorectal surgeries is to use lower dose of local anaesthetic providing segmental block with adjuvants such as opioids and clonidine. Clonidine has been used in low doses for outpatient anaesthesia. Dexmedetomidine

has been used intrathecally in varying doses ranging from 3 μg to 15 μg. The optimal dose of intrathecal dexmedetomidine has not been established. The present study was conducted to assess intrathecal dexmedetomidine as adjuvant for spinal anaesthesia for perianal ambulatory surgeries.

In present study we found that mean weight in group I was 64.5 kg and in group II was 63.1 kg, height was 156.2 cm in group I and 158.3 cm in group II, ASA grade I was 35 and II was 25 in group I and I in 30 and II in 30 in group II. The mean duration of surgery was 26.1 minutes in group I and 28.4 minutes in group II. Nethra et al[10] investigated effects of addition of 5 μg of dexmedetomidine to 6 mg of hyperbaric bupivacaine on duration of analgesia, sensory and motor block characteristics for perianal ambulatory surgeries. Forty adult patients between 18 and 55 years of age were divided into 2 groups. Group D received intrathecal 0.5% hyperbaric bupivacaine 6 mg (1.2 ml) with injection dexmedetomidine 5 μg in 0.5 ml of normal saline and Group N received intrathecal 0.5% hyperbaric bupivacaine 6 mg (1.2 ml) with 0.5 ml of normal saline. Time for regression of sensory level and time for first administration of analgesic were prolonged in Group D (430.05 ± 89.13 min, 459.8 ± 100.9 min, respectively) in comparison to Group N (301.10 ± 94.86 min, 321.85 ± 95.08 min, respectively). However, the duration of motor blockade, time to ambulation, and time to void were also significantly prolonged in Group D (323.05 ± 54.58 min, 329.55 ± 54.06 min, 422.30 ± 87.59 min) than in Group N (220.10 ± 63.61 min, 221.60 ± 63.84 min, 328.45 ± 113.38 min).

We found that mean duration of sensory block in group I was 432.4 minutes and in group II was 310.2 minutes, duration of motor block was 324.6 minutes in group I and 216.4 minutes in group II and time to ambulation was 310.2 minutes in group I and 210.4 minutes in group II. Kazak et al[11] in their study with 1.5 mg hyperbaric levobupivacaine for anal surgeries kept the patients in the sitting position at least 20 min in order to confine the small bolus of levobupivacaine to the lower end of the dural sac. Their patients did not have any motor blockade.

Sullivan et al[12] have found in their study that ED50 of dexmedetomidine for inhibition of C fibre responses of dorsal horn neurones was 2.5 μg and Aβ-evoked responses were inhibited to a lesser degree with a maximum inhibition seen above 10 μg dose. Hence, in this study, a low dose of 5 μg (more than ED50) was used in order to provide adequate post-operative analgesia, limit the motor blockade and facilitate early recovery and ambulation.

CONCLUSION

Authors found that intrathecal dexmedetomidine 5 μg added to intrathecal bupivacaine 6 mg as adjuvant may not be suitable for ambulatory perianal surgeries due to prolongation of motor blockade.

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