

ORIGINAL ARTICLE

Assessment of Analgesic Efficacy of Ropivacaine with Ropivacaine plus Dexmedetomidine for Epidural Block in Abdominal Hysterectomy Surgery

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ABSTRACT:

Background: Traditional abdominal hysterectomy (AH) is one of the most common gynaecological surgical procedures in the treatment of benign gynaecological diseases. Ropivacaine is a long-acting regional anaesthetic that is structurally related to Bupivacaine. Dexmedetomidine is a useful sedative agent with analgesic properties. Hence; the present study was undertaken for assessing and comparing the analgesic efficacy of Ropivacaine with Ropivacaine plus Dexmedetomidine for epidural block in abdominal hysterectomy surgery. **Materials & methods:** A total of 40 patients were enrolled who were scheduled to undergo abdominal hysterectomy surgery. All the patients were randomized into two study groups with 20 patient in each group as follows: Group A: Ropivacaine group, and Group B: Ropivacaine plus Dexmedetomidine. After placing the catheter in L1-L2 epidural space, general anaesthesia was instituted in all patients using a standardised technique. After recovery from GA, pain was assessed by VAS. The patients were administered first top up dose through epidural route as soon as VAS score exceeded 3 and time was noted for duration of analgesia. Total requirement of Ropivacaine in 24 hours was also noted. All the results were recorded and analysed by SPSS software. **Results:** Mean duration of analgesia was 169.3 minutes and 356.1 minutes among subjects of group A and group B respectively. Significant results were obtained while comparing the mean duration of analgesia among the patients of the two study groups. **Conclusion:** Addition of dexmedetomidine to local anaesthetic agent ropivacaine significantly prolongs the duration of analgesia in epidural blocks.

Key words: Abdominal Hysterectomy, Ropivacaine

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INTRODUCTION

Hysterectomy is currently one of the most common gynaecological surgical procedures. Hysterectomy is second to Caesarean delivery as the most frequently performed major surgical procedure for women of the reproductive age. Routes for hysterectomy include abdominal, vaginal, laparoscopic, or combined approaches. Traditional abdominal hysterectomy (AH) is one of the most common gynaecological surgical procedures in the treatment of benign gynaecological diseases. However, AH as the most invasive procedure, is associated with some limitations such as abdominal trauma, intraoperative and postoperative complications, and slow postoperative recovery. Surgical haemostasis can be secured by a variety of methods, including mechanical (sutures) or vessel coagulation (diathermy), although electrocoagulation diathermy has been shown to be unreliable for vessels larger than 2 mm in diameter.¹⁻³ One of the most important properties of a long-acting local anaesthetic is to reversibly inhibit the nerve impulses, thus causing a prolonged sensory or motor blockade appropriate for anaesthesia in different types of surgeries. The acute pain relief obtained at lower doses in postoperative and labour patients due to

sensory blockade is sometimes marred by accompanying motor blockade, which serves no purpose and is quite undesirable. Bupivacaine is a well-established long-acting regional anaesthetic, which like all amide anaesthetics has been associated with cardiotoxicity when used in high concentration or when accidentally administered intravascularly. Ropivacaine is a long-acting regional anaesthetic that is structurally related to Bupivacaine. It is a pure S(-) enantiomer, unlike Bupivacaine, which is a racemate, developed for the purpose of reducing potential toxicity and improving relative sensory and motor block profiles.⁴⁻⁷

Dexmedetomidine is a relatively new drug approved at the end of 1999 by the Food and Drug Administration (FDA) for human use for short-term sedation and analgesia (<24 hours) in the intensive care unit (ICU). Dexmedetomidine is a useful sedative agent with analgesic properties, hemodynamic stability and ability to recover respiratory function in mechanically ventilated patients facilitating early weaning.⁵⁻⁸ Hence; the present study was undertaken for assessing and comparing the analgesic efficacy of Ropivacaine with Ropivacaine plus Dexmedetomidine for epidural block in abdominal hysterectomy surgery.

MATERIALS & METHODS

The present study was conducted for assessing and comparing the analgesic efficacy of ropivacaine with ropivacaine plus dexmedetomidine for epidural block in abdominal hysterectomy surgery. A total of 40 patients were enrolled who were scheduled to undergo abdominal hysterectomy surgery. Ethical approval was obtained before the starting of the study. Complete demographic and clinical details were obtained. All the patients were randomized into two study groups with 20 patient in each group as follows: Group A: Ropivacaine group, and Group B: Ropivacaine plus Dexmedetomidine. After placing the catheter in L1-L2 epidural space, general anaesthesia was instituted in all patients using a standardised technique. After recovery from GA, pain was assessed by VAS. The patients were administered first top up dose through epidural route as soon as VAS score exceeded 3 and time was noted for duration of analgesia. Total requirement of Ropivacaine in 24 hours was also noted. All the results were recorded and analysed by SPSS software. Chi-square test and student t test was used for evaluation of level of significance.

RESULTS

Mean age of the patients of group A and group B was 43.6 years and 45.7 years respectively. Mean weight of the patients of the group A and group B was 62.1 Kg and 64.8 Kg respectively. Mean height of the patients of the group A and group B was 172.6 cm and 165.8 cm respectively. Mean duration of analgesia was 169.3 minutes and 356.1 minutes among subjects of group A and group B respectively. Significant results were obtained while comparing the mean duration of analgesia among the patients of the two study groups.

Table 1: Demographic data

Variables	Group A	Group B
Mean age (years)	43.6	45.7
Mean weight (Kg)	62.1	64.8
Mean height (cm)	172.6	165.8

Table 2: Comparison of mean duration of analgesia

Duration of analgesia (minutes)	Group A	Group B
Mean	169.3	356.1
SD	38.2	67.3
p- value	0.00 (Significant)	

DISCUSSION

Abdominal hysterectomy is one of the most commonly performed gynaecological operative procedures. The major conditions indicated for abdominal hysterectomy to be performed are: dysfunctional uterine bleeding, fibroid uterus, endometriosis and cervical intraepithelial dysplasia

etc. The patients usually suffer from moderate to severe anemia due to chronic blood loss in absence of the proper treatment. In conventional method of abdominal hysterectomy during operative procedure, haemorrhage caused by trauma or slipping and retraction of uterine arteries, ovarian arteries and injury to the ureters are of great concern to a gynecologist working especially in rural settings where there infrastructure and facilities like blood transfusion etc are not available easily.⁶⁻⁹ Hence; the present study was undertaken for assessing and comparing the analgesic efficacy of Ropivacaine with Ropivacaine plus Dexmedetomidine for epidural block in abdominal hysterectomy surgery.

In the present study, mean age of the patients of group A and group B was 43.6 years and 45.7 years respectively. Mean weight of the patients of the group A and group B was 62.1 Kg and 64.8 Kg respectively. Mean height of the patients of the group A and group B was 172.6 cm and 165.8 cm respectively. Karnawat R et al compared the efficacy of epidural block with ropivacaine or ropivacaine plus dexmedetomidine for relief of post-operative pain in patients undergoing abdominal hysterectomy surgery. Sixty adult patients of ASA grade I & II, undergoing abdominal hysterectomy surgery were included in this prospective, randomized study. After placing the catheter in L1-L2 epidural space, block was randomly activated either by 18 ml of ropivacaine 0.25% (Group I) or by 18 ml of ropivacaine 0.25% plus 1µg/kg dexmedetomidine (Group II). Mean duration of analgesia was longer in Group II (318.14±54.35 min) as compared to Group I (146.21 ±30.64 min) (p<0.05). Mean total consumption of ropivacaine was 89.42±12.32 mg in Group II and 122.36(14.26) mg in Group I (p< 0.05). Addition of dexmedetomidine to local anaesthetic agent ropivacaine significantly prolongs the duration of analgesia in epidural blocks.¹⁰

In the present study, mean duration of analgesia was 169.3 minutes and 356.1 minutes among subjects of group A and group B respectively. Significant results were obtained while comparing the mean duration of analgesia among the patients of the two study groups. Naithani U et al assessed the dose dependent effect of dexmedetomidine (3 mcg vs 5 mcg) as an adjunct to isobaric ropivacaine in spinal anesthesia. Forty selected female patients were randomized to receive intrathecal 0.5% isobaric ropivacaine (15 mg) with dexmedetomidine 3 mcg (Group D3) or 5 mcg (Group D5) in spinal anesthesia for abdominal hysterectomy. Both groups were comparable regarding sensory-motor block characteristics and postoperative analgesia (P > 0.05). Four (10%) patients of Group D5 and 5 (12.5%) of Group D3 could not achieve desired T6 sensory level and Bromage score of 3 (complete motor block) hence were converted to general anesthesia at the outset. Nine (22.5%) patients each in both groups required ketamine

supplementation (0.5 mg/kg) for intraoperative pain at the time of uterine manipulation. Incidence of hypotension was comparable (55.56% in Group D5 and 37.14% in Group D3, $P = 0.11$), but this occurred significantly earlier in Group D5, $P < 0.001$. Sedation was also significantly more in Group D5 as compared with Group D3, $P < 0.01$. They conclude that spinal anesthesia with isobaric ropivacaine (15 mg) with dexmedetomidine (3 mcg or 5 mcg) did not show much promise for abdominal hysterectomy as one third cases required analgesic supplementation.¹¹

CONCLUSION

Addition of dexmedetomidine to local anaesthetic agent ropivacaine significantly prolongs the duration of analgesia in epidural blocks.

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