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Original Research Article.

Post-Operative Pain Relief after Intraperitoneal Administration of Dexmedetomidine and Nalbuphine as Adjuncts to Ropivacaine Laparoscopic Cholecystectomy Patients: An Institutional Based Study

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ABSTRACT

Background: To assess the effect of Intraperitoneal administration of dexmedetomidine and nalbuphine as adjuncts to ropivacaine for post-operative pain relief in patient undergoing laparoscopic cholecystectomy.

Materials & Methods: 90 patients of either gender undergoing elective laparoscopic cholecystectomy under general anaesthesia were enrolled in the study. In group A, patients received 0.25% ropivacaine with dexmedetomidine 1mcg/kg, Group B patients received 0.25% ropivacaine with 5 mg nalbuphine, and group C patients received 0.25% ropivacaine with 10 mg nalbuphine. The VAS, or visual analogue scale, uses a 10-cm scale to indicate different levels of pain, ranging from no discomfort to the greatest suffering imaginable. Postoperative Visual analogue scales were used to measure post-operative pain. Tramadol 50 mg IV was administered when the VAS score was more than 3. SPSS software was used to analyse all of the results. Chi-square test and ANOVA was used for evaluation of level of significance.

Results: All the three study groups were comparable in terms of age-wise and gender-wise distribution of patients. Also postoperatively, throughout 24 hours period, no significant differences were observed among all the groups (p value > 0.05). No significant differences were observed among all the groups preoperatively (p value > 0.05) in terms of BP. Additionally, all groups' mean blood pressure throughout the postoperative period was comparable, with a p value > 0.05 that was statistically insignificant. When compared to group B and group C, group A's mean VAS scores were lower and considerably lower at the fourth and sixth postoperative hours. After that, there was no discernible difference in the VAS scores of the three groups.

Conclusion: Patients receiving 0.25% ropivacaine with dexmedetomidine 1mcg/kg showed best results.

Key words: Nalbuphine, Dexmedetomidine, Ropivacaine.

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INTRODUCTION

Sedation by a combination of an opioid drug such as pentazocine with a benzodiazepine is commonly used for minor surgical and investigative procedures. α2-adrenergic receptor (α2-AR) agonists have been successfully used in several clinical settings in view of diverse actions which include sedation, analgesia, anxiolysis, perioperative sympatholysis, cardiovascular stabilizing effects, reduced anesthetic requirements, and preservation of respiratory function. Dexmedetomidine is a relatively new drug approved at the end of 1999 by the Food and Drug Administration (FDA) for humans 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.[1-3] Nalbuphine is a newer drug which, like pentazocine, is an opioid agonist-antagonist. Its actions are similar, but it has theoretical advantages in its profile of cardiovascular side effects. Nalbuphine or pentazocine in combination with diazepam were compared as components of a sedative technique for invasive radiology.[4-6] Hence; the present study was conducted to assess the effect of Intraperitoneal administration of dexmedetomidine and nalbuphine as adjuncts to ropivacaine for post-operative pain relief in patients undergoing laparoscopic cholecystectomy at Department of Anaesthesiology, KM Medical College, Mathura, UP, India.

MATERIALS & METHODS

The present study was conducted in Department of Anaesthesiology, Krishna Mohan Medical College & Hospital, Mathura, Uttar Pradesh (India) to assess the effect of Intraperitoneal administration of dexmedetomidine and nalbuphine as adjuncts to ropivacaine for post-operative pain relief in patient undergoing laparoscopic cholecystectomy. Sample size for the present study included 90 patients. Only those patients were enrolled which were scheduled to undergo elective laparoscopic cholecystectomy under general anaesthesia were enrolled in the study. All the patients within the age group of 20 to 50 years and of ASA grade I and II undergoing elective laparoscopic cholecystectomy under general anaesthesia were enrolled in the study. In group A, patients received 0.25% ropivacaine with dexmedetomidine 1mcg/kg, Group B patients received 0.25% ropivacaine with 5 mg nalbuphine, and group C patients received 0.25% ropivacaine with 10 mg nalbuphine. In the operation theatre, intravenous (IV) line was established. Baseline measurements including heart rate, noninvasive systolic and diastolic blood pressure, mean blood pressure, oxygen saturation, and ECG were obtained using standard multipara monitors. After thorough oropharyngeal suctioning, the intubation was ended. After the patient had recovered from the anaesthesia, the nasogastric tube was withdrawn. The VAS, or visual analogue scale, uses a 10-cm scale to indicate different levels of pain, ranging from no discomfort to the greatest suffering imaginable. Postoperative Visual analogue scales were used to measure post-operative pain. Tramadol 50 mg IV was administered when the VAS score was more than 3. SPSS software was used to analyse all of the results. Chi-square test and ANOVA was used for evaluation of level of significance.

RESULTS

All the three study groups were comparable in terms of age-wise and gender-wise distribution of patients. Also postoperatively, throughout 24 hours period, no significant differences were observed among all the groups (p value > 0.05). No significant differences were observed among all the groups preoperatively (p value > 0.05) in terms of BP. Additionally, all groups' mean blood pressure throughout the postoperative period was comparable, with a p value > 0.05 that was statistically insignificant. When compared to group B and group C, group A's mean VAS scores were lower and considerably lower at the fourth and sixth postoperative hours. After that, there was no discernible difference in the VAS scores of the three groups.

Graph 1: Demographic data and ASA Grade

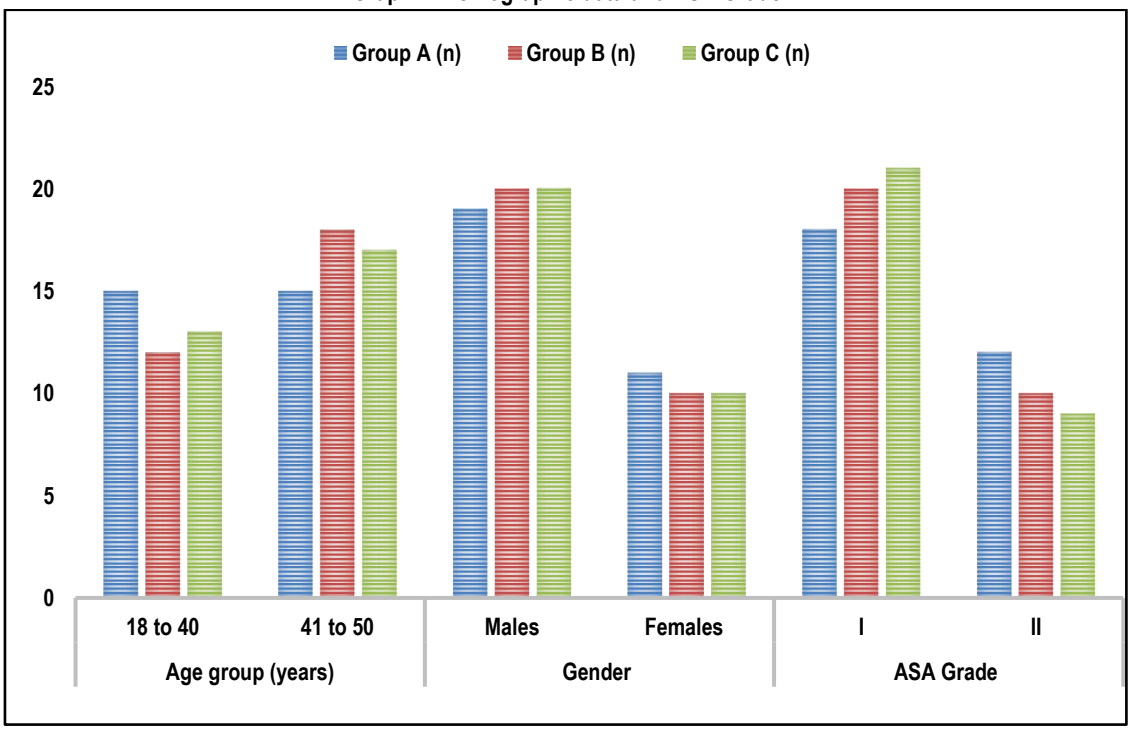
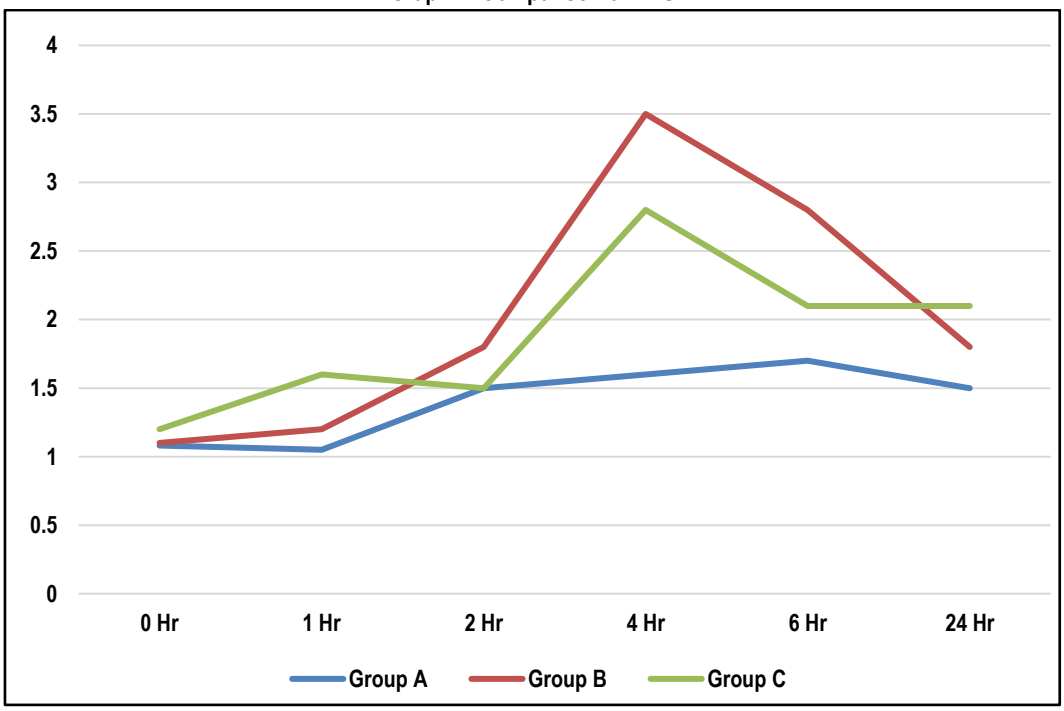


Table 1: Comparison of VAS at different time intervals

VAS (hours)	Group A	Group B	Group C	p- value
0	1.08	1.1	1.2	0.12
1	1.05	1.2	1.6	0.81
2	1.5	1.8	1.5	0.34
4	1.6	3.5	2.8	0.000 (Sig)
6	1.7	2.8	2.1	0.000 (Sig)
24	1.5	1.8	2.1	0.77

Graph 2: Comparison of VAS



DISCUSSION

Opioids are commonly used as analgesics during the perioperative period, which is an integral part of the treatment of pain due to surgery and labour1. Morphine is the standard opioid analgesic for pain control. When it is used appropriately, about 80% of patients will achieve adequate pain relief. However, many patients may change to an alternative opioid, because of the intolerable adverse effects associated with morphine. Nalbuphine is an opioid agonist-antagonist of the phenanthrene series which was synthesized in an attempt to provide analgesia without the undesirable side effects of the pure agonists. Its analgesic and possibly certain anti-pruritic effects are mediated via actions on the μ and κ-receptors, and nalbuphine has been indicated for mild to moderate pain.[7]

The use of α2-adrenoceptor agonists as anesthetics is not new. Veterinarians employed xylazine and dexmedetomidine for a long time to induce analgesia and sedation in animals, and much of our knowledge was gained from this application. It has recently become evident that complete anesthesia is possible by employing new, more potent α2 agonists, such as medetomidine and its stereoisomer, dexmedetomidine. Dexmedetomidine was approved by the Food and Drug Administration at the end of 1999 for use in humans as a short-term medication (<24 hours) for analgesia and sedation in the intensive care unit (ICU). Its unique properties render it suitable for sedation and analgesia during the whole perioperative period. Its applications as a premedication, as an anesthetic adjunct for general and regional anesthesia, and as a postoperative sedative and analgesic are similar to those of the benzodiazepines, but a closer look reveals that the α2-adrenoceptor agonist has more beneficial side effects.[8- 10] Hence; the present study was conducted to assess the effect of Intraperitoneal administration of dexmedetomidine and nalbuphine as adjuncts to ropivacaine for post-operative pain relief in patient undergoing laparoscopic cholecystectomy

All the three study groups were comparable in terms of age-wise and gender-wise distribution of patients. When compared to group B and group C, group A's mean VAS scores were lower and considerably lower at the fourth and sixth postoperative hours. After that, there was no discernible difference in the VAS scores of the three groups. Arunkumar, Sruthi et al, in a previous study, compared the effect of clonidine and dexmedetomidine when used as an adjuvant to epidural ropivacaine in lower abdominal and lower limb surgeries. Patients were randomized into two groups- group ropivacaine with clonidine (RC) received 15 ml of 0.75% ropivacaine with 1 μg/kg clonidine and group ropivacaine with dexmedetomidine (RD) received 15 ml of 0.75% ropivacaine with 1 μg/kg dexmedetomidine epidurally. The onset (RD-8.53 ± 1.81, RC-11.93 ± 1.96) and duration of sensory blockade (RD-316 ± 31.5, RC-281 ± 37, sedation were found to be significantly better in the dexmedetomidine group. No significant difference was found in terms of onset of motor blockade and hemodynamic changes. Dexmedetomidine at doses of 1 μg/kg is an effective adjuvant to ropivacaine for epidural anesthesia, which is comparable to clonidine.[11] Kathuria, Suneet et al, compared the effect of dexmedetomidine as an adjuvant to ropivacaine in supraclavicular brachial plexus block. Sixty American Society of Anesthesiologist grade I and II patients of either sex scheduled for elective upper limb surgery under supraclavicular brachial plexus block were divided into three equal groups in a prospective randomized double-blind controlled manner. For block patients in Group C received 0.5% ropivacaine (30cc), 0.5% ropivacaine with 50 μg dexmedetomidine (30cc) in Group D and 0.5% ropivacaine (30cc) in Group D-IV along with intravenous infusion of 50 μg dexmedetomidine in normal saline. Demographic profile and surgical characteristics were similar in all the three groups. Sensory block and motor block onset was earlier in group D than in group D-IV and group C. The sensory block and motor block duration was also prolonged in group D when compared with group D-IV and group C. The duration of analgesia was significantly longer in group D and D-IV when compared to group C.[12]

CONCLUSION

Patients receiving 0.25% ropivacaine with dexmedetomidine 1mcg/kg showed best results.

REFERENCES

1. Kemp KM, Henderlight L, Neville M. Precedex: Is it the future of cooperative sedation? Nursing. 2008;38(Suppl Critical):7–8.
2. Takrouri MS, Seraj MA, Channa AB, el-Dawlatly AA, Thallage A, Riad W, et al. Dexmedetomidine in intensive care unit: A study of hemodynamic changes. Middle East J Anesthesiol. 2002;16:587–95
3. Takrouri MS. New concepts in intensive care: Dexmedetomidine and immunonutrition. Middle East J Anesthesiol. 2002;16:567–72.
4. Kay B, Hargreaves J, Healy TE. Nalbuphine and Althesin anaesthesia. A controlled double-blind comparison for cystoscopy. Anaesthesia. 1984 Jul;39(7):666–669.
5. Gal TJ, DiFazio CA, Moscicki J. Analgesic and respiratory depressant activity of nalbuphine: a comparison with morphine. Anesthesiology. 1982 Nov;57(5):367–374.
6. Romagnoli A, Keats AS. Ceiling effect for respiratory depression by nalbuphine. Clin Pharmacol Ther. 1980 Apr;27(4):478–485.
7. Zeng, Zheng et al. A comparison of nalbuphine with morphine for analgesic effects and safety: meta-analysis of randomized controlled trials. Scientific reports vol. 5 10927. 3 Jun. 2015, doi:10.1038/srep10927
8. Tamsen A, Gordh T. Epidural clonidine produces analgesia. Lancet. 1984;2:231–232.
9. Clarke KW, Hall LW. Xylazine"—a new sedative for horses and cattle. Vet Rec. 1969;85:512–517.
10. Alquist RP. A study of adrenergic receptors. Am J Physiol. 1948;153:586–589.
11. Arunkumar, Sruthi et al. Comparison of dexmedetomidine and clonidine as an adjuvant to ropivacaine for epidural anesthesia in lower abdominal and lower limb surgeries. Saudi journal of anaesthesia 2015; 9(4): 404-8. doi:10.4103/1658-354X.159464
12. Kathuria, Suneet et al. Dexmedetomidine as an adjuvant to ropivacaine in supraclavicular brachial plexus block. Saudi journal of anaesthesia 2015; 9(2): 148-54. doi:10.4103/1658-354X.152841

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