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Original Research Paper

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ANALGESIC EFFICACY WITH INTRAVENOUS DEXMEDETOMIDINEWITH INTRAPERITONEAL INSTILLATION OF LEVOBUPIVACAINEIN ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMIES UNDER GENERAL ANAESTHESIA

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ABSTRACT

Background: Post-operative pain is of major concern following laparoscopic cholecystectomy which results in reduced patients' comfort and longer hospital stay.

Aim: Analgesic efficacy with intravenous dexmedetomidinewith intraperitoneal instillation of levobupivacaine in elective laparoscopic cholecystectomies under general anaesthesia

Patients and Methods: This prospective, randomized, double-blind controlled study was conducted on 70 adults of ASA physical status I and II, scheduled for laparoscopic cholecystectomy under general anaesthesia. Patients were randomized to one of the two groups (n= 35 each). Group Areceived intravenous 10 ml normal saline (NS) over 10 minutes before extubation along with intraperitoneal instillation of 28 mL Levobupivacaine 0.25% with 2ml of normal saline, while groups Bdexmedetomidine 0.5 μg/kg intravenous (IV) in 10 ml normal saline (NS) over 10 minutes before extubation along with intraperitoneal instillation of levobupivacaine to total volume of 30 ml. Visual analogue scale (VAS), sedation score, time to require first dose of rescue analgesia, and side effect profile noted. Results: Intravenous dexmedetomidine provided significantly higher degree of sedation, and reduced post-operative pain, and increased time to require first dose of rescue analgesia. Side effect profile was comparable.

Conclusion: Intravenous dexmedetomidinemay be an alternate choice to manage post-operative pain during laparoscopic cholecystectomy.

KEYWORDS : Levobupivacaine, dexmedetomidine, analgesia

INTRODUCTION

Post-operative pain remains a challenging problem especially during 24 hours post-operatively following laparoscopic cholecystectomy. Various pharmacological methods have been suggested to provide analgesic effects which reduce pain, and provide patients' comfort.

Opioids have been used as analgesia during and after laparoscopic cholecystectomy. However, undesirableside effects such as respiratory depression, nausea and vomiting, urinary retention, and pruritus have led to minimize their use.[1]To minimize these side effects, various other methods have been suggested. Recently, newer studies have been published which have highlighted the possible role of intravenous (i.v.) dexmedetomidine in providing postoperative analgesia through the reduction of opioid consumption.[2]

Dexmedetomidine is a highly selective α2 receptor agonist with sympatholytic, sedative, analgesic, amnestic and opioid-sparing properties.[3,4] This study compared analgesic effect of low dose dexmedetomidine (0.5 μg/kg) along with intraperitoneal instillation of levobupivacaine (0.25%) with intraperitoneal instillation of levobupivacaine (0.25%) alone.

PATIENTS AND METHODS

This study was carried out on patients between 20 to 60 years of age of either sex belonging to American Society of Anesthesiologists (ASA) physical status 1 and 2 and scheduled for elective laparoscopic cholecystectomy scheduled under general anaesthesia were included in this study at Department of Anesthesiology, Dr. RPGMC, Kangra at Tanda, Himachal Pradesh. The patients were excluded if with cardiovascular or respiratory disorders(diabetes, hypertension, asthma), obesity (BMI>30 kg/m^2), and/or difficult airway, history of sleep apnea and those for emergency procedures and need for leaving intra-abdominal drains.

After Institutional board approval and patients' written informed consent, patients were taken up for this randomized, double blind, controlled trial. Using computer generated random allocation; the patients were divided into three groups (35 patients in each group): **Group (A):** Patients received intravenous 10 ml normal saline (NS) over 10 minutes before extubation along with intraperitoneal instillation of 28 mL Levobupivacaine 0.25% with 2ml of normal saline; **Group (B):**Patients received dexmedetomidine 0.5 μg/kg intravenous (IV) in 10 ml normal saline (NS) over 10 minutes before extubation along with intraperitoneal instillation of levobupivacaine to total volume of 30 ml.

Intraperitoneal instillations were guided by the camera on the surgical site and under both the copulae of the diaphragm. The drug was injected intraperitoneally into the infraumbilical incision before the removal of trocar at the end of the surgery, in trendelenberg position to facilitate dispersion of drug solution in sub hepatic region. At the same time, the intravenous drug solution was given over a period of 5 minutes.

Sedation score

Postoperative sedation was evaluated on a 6 point scale (Ramsay Scale): 1 = Anxious or agitated and restless or both, 2 = Cooperative, oriented and tranquil, 3 = Drowsy but responds to commands, 4 = Asleep, brisk response to light glabellar tap or loud auditory stimulus, 5 = Asleep, sluggish response to light glabellar tap or loud auditory stimulus, 6 = Asleep and unarousable.

Pain assessment

The intensity of the pain was assessed using visual analogue scale (VAS) at 1 h, 4 h, 8 h, 12 h, 18 h, and 24 h. Where zero score corresponds to 'no pain' and 10 corresponds to the 'maximum' or 'worst pain'.

Rescue analgesia

Rescue analgesia was given in the form of inj. diclofenac sodium 75 mg i.v. at VAS >3. Total analgesic consumption in the first 24 h postoperatively and occurrence of nausea, vomiting and sedation were also recorded.

Statistical analysis

Data were expressed as frequency, mean, and standard deviation. Quantitative and categorical variables were compared using Student t-test and Chi square test respectively. P value <0.05 was considered significant. Statistical analysis was performed using SPSS v21.

RESULTS

In the present study, all the study subjects in both groups had comparable demographic profile in terms of age, sex, and ASA grade. Baseline hemodynamic parameters such as heart rate, blood pressure, mean arterial pressure, and SPO2 were also comparable between the groups.

Pain assessment

There was a significant difference in pain score at 4h, 8h, 12h, 18h, and 24h post-operatively. Intravenous dexmedetomidine has significantly managed to reduce post-operative pain from 4 hours up to 24 hours (Table 1).

Sedation score

In the present study, patients in dexmedetomidine group had higher degree of sedation in comparison to the patients who did not receive dexmedetomidine up to 24 hours; however, a significant increase was observed up to one hour ($P<0.05$) (Table 2).

Time to require first dose of rescue analgesia

Time to require first dose of rescue analgesia was significantly higher in group B in comparison to group A ($P<0.05$) (Table 3).

Side effects

Incidence of nausea and vomiting was comparable in both groups (one patient in group A and 2 patients in group B).

DISCUSSION

The use of intravenousdexmedetomidine in patients undergoing laparoscopic cholecystectomy has been shown to reduce anaesthetic requirement,[5] reduced inflammatory response,[6] reduced postoperative pain,[7] and better haemodynamic response to pneumoperitoneum.[8]

In our study, patients in dexmedetomidine group had significantly lesser pain from 4 hours up to 24 hours. In a study by Chilkoti et al, a statistically significant reduction in VAS pain score was observed in IV dexmedetomidine group when compared to the control group at all-time points till the end of 12th hour. However, mean VAS pain scores in IV dexmedetomidine group and IP dexmedetomidine group were found to be comparable at various time points except at the end of first hour.[9]

In one of the previous studies, it was demonstrated that mean sedation scores were higher in dexmedetomidine groups as compared to normal saline.[10]

In this study, time to require first dose of rescue analgesia was significantly higher in group B in comparison to group A. Similarly, in Chilkoti et al study, the mean time to first request of analgesia in this study was found to be highest in the IV dexmedetomidine group (210.52 ± 161.17 min) followed by IP group.[9]

CONCLUSION

In conclusion, administration of intravenous dexmedetomidinealong with intraperitoneal administration of levobupivacaine reduces post-operative pain, provide better sedation, and increases time to require first dose of rescue analgesia.

Table 1: Comparison of post-operative pain (VAS scale)

Time interval	Group A	Group B	P Value
0 Min	2.0±0.78	1.97±0.95	0.886
1 hour	3.00±1.80	2.43±0.95	0.102
4 hours	4.63±2.70	2.88±1.71	0.002
8 hours	5.14±2.52	2.89±1.48	0.0001
12 hours	5.80±3.20	3.17±1.42	0.0001
18 hours	5.17±2.57	3.08±1.50	0.0001
24 hours	5.51±2.92	3.14±1.40	0.0001

Data were expressed as mean±SD

Table 2: Comparison of sedation score

Time interval	Group B	Group BD	P Value
0 Min	3.40±1.83	5.26±0.78	0.0001
1 hour	3.11±1.81	4.06±0.87	0.007
4 hours	3.80±1.78	4.40±1.17	0.100
8 hours	3.34±1.73	3.86±0.87	0.117
12 hours	3.74±1.60	3.83±0.82	0.768
18 hours	3.51±1.61	3.97±0.78	0.133
24 hours	3.37±1.65	3.91±0.78	0.085

Data were expressed as mean±SD

Table 3: Comparison of time to first dose of rescue analgesia

Time to first dose of rescue analgesia	Group A	Group B	P value
	67.23±11.63	93.92±10.12	0.0001

Data were expressed as mean±SD

REFERENCES

1. Bisgaard T. Analgesic treatment after laparoscopic cholecystectomy: a critical assessment of the evidence. Anesthesiology. 2006;104:835–46
2. Tufanogullari B, White PF, Peixoto MP, Kianpour D, Lacour T, Griffin J, et al. Dexmedetomidine infusion during laparoscopic bariatric surgery: The effect on recovery outcome variables. AnesthAnalg. 2008;106:1741–8
3. Alexander JI. Pain after laparoscopy. Br J Anaesth 1997;79:369-78
4. Gupta R, Bogra J, Kothari N, Kohli M. Postoperative analgesia with intraperitoneal fentanyl and bupivacaine: A randomized control trial. Can Jr Med 2010;11-11
5. Khanduja S, Ohri A, Panwas M. Dexmedetomidine decreases requirement of thiopentone sodium and pentazocine followed with improved recovery in patients undergoing lapraroscopic cholecystectomy. J AnesthesiolClinPharmacol 2014;30:208-12
6. Kang SH, Kim YS, Hong TH, Chaes MS, Cho ML, Her YM, et al. Effect of dexmedetomidine on inflammatory repair in patients undergoing laparoscopic cholecystectomy. ActaAnesthesiolScand 2013;57:480-7
7. Park JK, Cheong SH, Lee KM, Lim SH, Lee JH, Cho K, et al. Does dexmedetomodine reduce postoperative pain after laparoscopic cholecystectomy with multimodal analgesia? Korean J Anesthesiol 2012;63:436-40
8. Kumar S, Kushwaha BR, Prakash R, Jafa S, Malik A, Wahal R, et al. Comparative study of effects of dexmedetomidine and clonidine premedication in perioperative hemodynamic stability and postoperative analgesia in laparoscopic cholecystectomy. Internet J Anesthesiol 2014;33
9. Chilkoti GT, Kumar M, Mohta M, Saxena AK, Sharma N, Singh J. Comparison of postoperative analgesic efficacy of low-dose bolus intravenous dexmedetomidine and intraperitonealdexmedetomidine with bupivacaine in patients undergoing laparoscopic cholecystectomy: A randomised, controlled trial. Indian J Anaesth 2019;63:106-13
10. Manne GR, Upadhyay MR, Swadia V. Effects of low dose dexmedetomidine infusion on haemodynamic stress response, sedation and post-operative analgesia requirement in patients undergoing laparoscopic cholecystectomy. Indian J Anaesth. 2014;58:726–31