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EFFICACY OF PERIOPERATIVE INFUSION OF LIGNOCAINE VS DEXMEDETOMIDINE ON RECOVERY PROFILE IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY. A RANDOMIZED CONTROLLED TRIAL

Anaesthesiology

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ABSTRACT

Background: Nowadays, anesthesiologists are evaluating several analgesic adjuncts to minimize opioid use during surgeries. Some studies have evaluated the analgesic sparing effect of intravenous infusion of dexmedetomidine and lidocaine on intraoperative hemodynamics and post-operative analgesia. There is a paucity of studies focussing on the intraoperative analgesic requirement. **Aims And Objectives:** The present study compared dexmedetomidine and lidocaine infusion primarily for their effects on intraoperative fentanyl requirements during general anaesthesia. **Materials And Methods:** This study was done on 70 patients aged 18–80 years, the American Society of Anesthesiologists physical status I–II, having Glasgow Coma Scale 15. Patients were randomly allocated to receive either dexmedetomidine (group A, n=35) at a dose of 0.6 mcg/kg bolus over 10 min followed by 0.6 mcg/kg/h infusion or lidocaine (group B, n=35) at a dose of 1.5 mg/kg bolus over 10 min, followed by 1.5 mg/kg/h infusion till the end of skin suture, respectively. Study drugs were started 10 min before the start of surgery. Intraoperative total fentanyl and propofol consumption, intraoperative hemodynamics, recovery from hypnosis, and time to extubation were recorded. **Results:** The use of dexmedetomidine resulted in considerably less total fentanyl requirements. Comparatively better hemodynamics were observed with the use of dexmedetomidine at all the points of observation. **Conclusion:** Dexmedetomidine as an analgesic adjunct can be a better alternative to lidocaine in terms of reduced fentanyl consumption, reduced propofol use and favorable hemodynamics, and early recovery from anesthesia.

KEYWORDS

Analgesic; Dexmedetomidine; Fentanyl; Hemodynamics; Lidocaine; Propofol

INTRODUCTION

In recent years, practicing anesthesiologists utilized various non-opioid analgesic adjuncts such as dexmedetomidine and lidocaine in the perioperative periods to curtail the use of opioids as a part of enhanced recovery after surgery protocol and to minimize opioid-related adverse events[1-4]. Perioperative use of intravenous (IV) dexmedetomidine during general anesthesia in adult patients led to extended pain-free periods, reduced pain intensity, and decreased consumption of opioids in the post-operative period[5]. Many studies[6-9] have investigated the analgesic-sparing effect of perioperative IV infusion of dexmedetomidine and lidocaine. Some studies have reported a considerable reduction of the total dose of analgesic consumption with the use of dexmedetomidine over lidocaine while other studies have reported comparable the Visual Analog Scale scores in the post-operative pain assessment. Most of the studies have focused on assessing intraoperative hemodynamics such as heart rate (HR) or mean arterial pressure (MAP) and post-operative pain scores or total analgesics consumption in the post-operative period.

MATERIALS AND METHODS

Inclusion Criteria

Seventy patients of either sex, aged 18–80 years, weighing between 50 and 80 kg with the American Society of Anesthesiologists (ASA) physical status I and II with the Glasgow Coma Scale score 15, scheduled for elective surgery for were included in this study.

Exclusion Criteria

Patients with known hypersensitivity to study drugs, those with renal, hepatic, or cardiac insufficiency, those suffering from psychiatric illness or on long-term sedatives, and unwilling patients were excluded.

Before induction, the arterial cannula was inserted in the radial artery after . Initially, patients received pre-oxygenation with 100% oxygen for 3 min. Before induction, patients of both groups received bolus fentanyl (2 mcg/kg). Induction of anesthesia was done using propofol 2 mg/kg in the running fluid. After checking mask ventilation, an injection of atracurium (0.5 mg/kg) was administered through the IV route and the airway was secured with an endotracheal tube of appropriate size after mask ventilation . Adequacy of muscle relaxation was judged clinically with adequate jaw relaxation. The correct position of the endotracheal tube position was confirmed by capnography. The patients were mechanically ventilated with an anesthesia machine using volume-controlled mode. A circle system was used for ventilation of the lungs to maintain EtCO2 between 35 and 40 mm Hg and peak airway pressure<3mmhg.

Ten minutes before the induction of anesthesia IV infusion of the study drug solutions was started in both the groups at a rate of 0.9 mL/kg/h. This infusion rate corresponds to 0.6 mcg/kg of dexmedetomidine or 1.5 mg/kg of lidocaine. After the loading dose, the infusion rate was reduced to 0.15 mL/kg/h, which translates into 0.6 mcg/kg/h of dexmedetomidine and 1.5 mg/kg/h of lidocaine.

The reversal of the neuromuscular block was attempted using injection neostigmine (50 mcg/kg) and injection glycopyrrolate (10 mcg/kg). Then patients were extubated and the time was noted. Extubation time was measured from the stoppage of study drug infusion to the point of tracheal extubation, and after extubation, patients were transferred to the post-anesthesia care unit.

MAP	dexmedetomidine	lidocaine	P value
30 min	78.8± 5.5	83.9± 7.1	<0.001
60 min	78.9 ±5.4	84.2± 7.2	<0.001
90 min	78.9± 4.8	85.8 ±5.5	<0.001
120 min	80.2 ±3.1	85.6 ±5.2	<0.001
150 min	81.1± 3.0	86.0± 4.5	<0.001
Post extbation	83.9 ±3.2	87.6± 2.7	<0.001

RESULTS

Intraoperative Propofol And Fentanyl Requirement

PARAMETERS	DEXMEDETOMIDINE (n=35)	LIDOCAINE (n=35)	P VALUE
TOTAL FENTANYL REQUIRED	24.1 ± 25.9	300.7 ±22.1	<0.001
TOTAL PROPOFOL REQUIRED(mg)	172.7 ± 7.6	236.7± 17.5	<0.001
Recovery from hypnosis	6.8± 1.4	7.6 ± 1.3	<0.001
Time to extubation(min)	18.3± 4.4	23.2± 3.8	<0.001

Trend Of Mean Arterial Pressure Between The Group

Data presented as mean ± deviation and analyzed with student's unpaired t-test, MAP: Mean arterial pressure

Trend Of Heart Rates Between The Groups

Heart rate	dexmedetomidine	lidocaine	P value
30 min	69.7 ±7.8	71.8± 8.1	0.0275
60 min	69.6 ±7.8	73.3 ±5.6	0.027

90 min	66.9± 7.6	64.3 ±7.7	0.155
120 min	67.0 ±8.5	70.1 ± 5.1	0.067
150 min	69.8±7.3	73.5 ± 4.8	0.016
Post extbation	78.3 ±3.4	78.9± 6.7	0.622

Data presented as mean±deviation and analyzed with student's unpaired t-test, HR: Heart rate

DISCUSSION:

The present study finds that patients receiving intraoperative dexmedetomidine infusion consumed about 55 mcg less fentanyl consumption in the intraoperative period in comparison with lidocaine infusion. A study by Menshawi and Fahim also reports lower consumption of intraoperative analgesics with the use of intraoperative infusion of dexmedetomidine over lidocaine (about 93 mcg vs. 105 mcg, respectively). Contrast reporting does exist in two recent studies that observed that the mean intraoperative fentanyl consumption was comparable with the use of intraoperative dexmedetomidine and lidocaine..

CONCLUSION

Intraoperative infusion of dexmedetomidine can be a better alternative to lidocaine infusion as an analgesic adjunct in view of lower consumption of fentanyl and propofol during craniotomy surgery. Maintaining comparatively lower MAP and HR throughout the intraoperative period without clinically significant adverse events appears to be an additional advantage.

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Conflict Of Interest – None declared
Ethical Approval – The study was approved by the institutional ethics committee

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