

Effects of intravenous Dexmedetomidine on Intraoperative Hemodynamic Parameters in the Patients Undergoing Laparoscopic Cholecystectomy

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Abstract

Background: Dexmedetomidine, in addition to sympatholytic effect, diminishes intraoperative requirement of anesthetics including propofol. The present study was conducted to evaluate the effects of intravenous dexmedetomidine on intraoperative hemodynamics in laparoscopic cholecystectomy. **Subjects and Methods:** Five patients undergoing laparoscopic cholecystectomy received dexmedetomidine. Dexmedetomidine was loaded (1 $\mu\text{g}/\text{kg}$) before anesthesia induction and infused (0.6 $\mu\text{g}/\text{kg}/\text{h}$) during surgery. Anesthesia was induced with propofol. Mean arterial pressure (MAP) and heart rate (HR) were recorded at baseline and at various time points from the loading of drugs to just after tracheal extubation. **Results:** Both HR and MAP decreased till insufflation and then increased at extubation. **Conclusion:** During propofol-based anesthesia for laparoscopic cholecystectomy, dexmedetomidine provides stable intraoperative hemodynamics.

Keywords: Dexmedetomidine, Mean Arterial Pressure, Heart Rate

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Introduction

Despite multiple benefits, any laparoscopic surgery always poses a challenge to its successful anesthetic management, mainly due to significant alteration of hemodynamics, resulting from the combined effects of pneumoperitoneum, patient position, anesthesia, and hypercapnia from the absorbed CO_2 that is used to produce pneumoperitoneum.^[1] Dexmedetomidine, which is the pharmacologically active dextro-isomer of medetomidine, is a newer highly selective α_2 -adrenergic agonist.^[2]

This study evaluated the effect on intravenous (IV) dexmedetomidine in the patients undergoing laparoscopic cholecystectomy.

Subjects & Methods

Five patients of American Society of Anesthesiologists (ASA) physical status classes I and II between 40 and 50 years of

age with body weight 60–70 kg of either sex and posted for laparoscopic cholecystectomy under general anesthesia were included in the study. An infusion was prepared by a separate anesthetist in a separate room according to the group allotted. To prepare the infusion, dexmedetomidine 2 ml containing 200 μg of the drug was withdrawn in a 50 mL syringe and was diluted up to 50 mL with normal saline resulting in the final concentration of 4 $\mu\text{g}/\text{ml}$.

Data were presented as frequency, percentage, mean, and/or standard deviation. Data at different time points were compared using paired t-test.

Results

The mean age of the patients was 46.25 ± 4.12 years. Sixty percent of them were females. The mean duration of surgery was 48.13 ± 5.83 minutes.

There was a drop in mean pulse rate from baseline (83.21 ± 11.24 beats/min) to 77.12 ± 7.71 beats/min at the

time of insufflation. After extubation, the mean pulse rate restored to baseline values (85.22 ± 3.36 beats/min). A similar change in pulse rate and mean arterial pressure was noted [Figure 1]. The extubation time was 13.12 minutes.

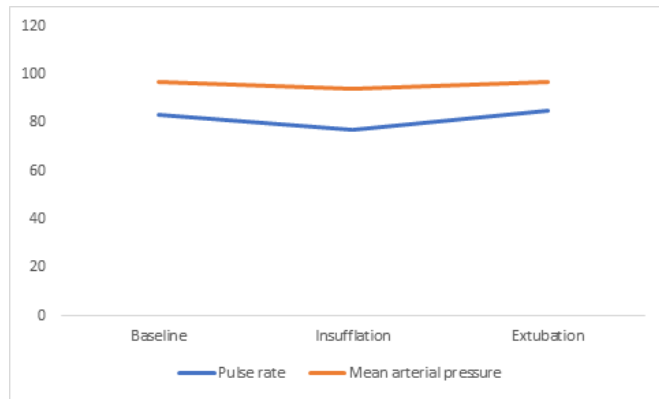


Figure 1: Change in pulse rate and mean arterial pressure

Discussion

The hemodynamic alterations due to intense sympathetic stimulation accompanying laparoscopic surgery comprising of elevation in heart rate and rise in mean arterial pressure are well known. The potential for life-threatening complications associated with such a response is also well documented. There exists a strong relationship of both perioperative myocardial ischemia and postoperative myocardial infarction with anesthetic and surgical events known to produce intense sympathetic stimulation, with or without hemodynamic abnormalities.^[3]

Our study confirms the fact that stressful events such as laryngoscopy and endotracheal intubation, pneumoperitoneum, and extubation do lead to a significant decrease in PR and MAP in patients undergoing laparoscopic cholecystectomy with IV

dexmedetomidine.^[4]

Conclusion

In conclusion, dexmedetomidine provides more stable intraoperative hemodynamic during laparoscopic cholecystectomy.

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