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SCIENTIFIC ARTICLE

Effect of intraoperative esmolol infusion on anesthetic, analgesic requirements and postoperative nausea-vomitting in a group of laparoscopic cholecystectomy patients



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KEYWORDS

Esmolol;
Postoperative pain;
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Abstract

Purpose: Postoperative pain and nausea/vomitting (PNV) are common in laparoscopic cholecystectomy patients. Sympatholytic agents might decrease requirements for intravenous or inhalation anesthetics and opioids. In this study we aimed to analyze effects of esmolol on intraoperative anesthetic-postoperative analgesic requirements, postoperative pain and PNV.

Methods: Sixty patients have been included. Propofol, remifentanyl and vecuronium were used for induction. Study groups were as follows; I – Esmolol infusion was added to maintenance anesthetics (propofol and remifentanyl), II – Only propofol and remifentanyl was used during maintenance, III – Esmolol infusion was added to maintenance anesthetics (desflurane and remifentanyl), IV – Only desflurane and remifentanyl was used during maintenance. They have been followed up for 24 h for PNV and analgesic requirements. Visual analog scale (VAS) scores for pain was also been evaluated.

Results: VAS scores were significantly lowest in group I ($p=0.001-0.028$). PNV incidence was significantly lowest in group I ($p=0.026$). PNV incidence was also lower in group III compared to group IV ($p=0.032$). Analgesic requirements were significantly lower in group I and was lower in group III compared to group IV ($p=0.005$). Heart rates were significantly lower in esmolol groups (group I and III) compared to their controls ($p=0.001$) however blood pressures were similar in all groups ($p=0.594$). Comparison of esmolol groups with controls revealed that there is a significant decrease in anesthetic and opioid requirements ($p=0.024-0.03$).

Conclusion: Using esmolol during anesthetic maintenance significantly decreases anesthetic-analgesic requirements, postoperative pain and PNV.

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PALAVRAS-CHAVE

Esmolol;
Dor no
pós-operatório;
Vômito no
pós-operatório

Efeito da infusão de esmolol sobre a necessidade de anestesia no intraoperatório e analgesia, náusea e vômito no pós-operatório em um grupo de pacientes submetidos à colecistectomia laparoscópica

Resumo

Objetivo: A dor e a incidência de náusea e vômito no período pós-operatório (NVP) são comuns em pacientes submetidos à colecistectomia laparoscópica. Os agentes simpatolíticos podem diminuir a necessidade de opiáceos ou anestésicos inalatórios ou intravenosos. Neste estudo, nosso objetivo foi analisar os efeitos de esmolol sobre a necessidade de anestésico no período intraoperatório e de analgésico no pós-operatório e a incidência de dor e NVP.

Métodos: Sessenta pacientes foram incluídos. Propofol, remifentanil e vecurônio foram usados para a indução. Os grupos de estudo foram os seguintes: grupo I, a infusão de esmolol foi adicionada aos anestésicos (propofol e remifentanil) para manutenção; grupo II, apenas propofol e remifentanil foram usados durante a manutenção; grupo III, a infusão de esmolol foi adicionada aos anestésicos (desflurano e remifentanil) para manutenção; grupo IV, apenas desflurano e remifentanil foram usados durante a manutenção. O período de acompanhamento foi de 24 horas para avaliar a incidência de NVP e a necessidade de analgésicos. Os escores de dor também foram avaliados por meio da Escala Visual Analógica (EVA).

Resultados: Os escores EVA foram significativamente menores no grupo I ($p=0,001-0,028$). A incidência de NVP foi significativamente menor no grupo I ($p=0,026$). NVP também foi menor no grupo III em relação ao grupo IV ($p=0,032$). A necessidade de analgésicos foi significativamente menor no grupo I e menor no grupo III em relação ao grupo IV ($p=0,005$). A frequência cardíaca foi significativamente menor nos grupos esmolol (grupos I e III) comparados aos controles ($p=0,001$), mas a pressão arterial foi semelhante em todos os grupos ($p=0,594$). A comparação entre os grupos esmolol e controles revelou que houve uma diminuição.

Conclusão: O uso de esmolol durante a manutenção da anestesia reduz significativamente a necessidade de anestésico-analgésico, dor e incidência de NVP.

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Introduction

Laparoscopic cholecystectomy became a daily routine procedure with low cost and high patient satisfaction by developments in surgical and anesthetic techniques. Despite of high success rates in postoperative pain and nausea-vomiting (PNV) are still important problems that delay patient discharge. Intra and postoperative hemodynamic stability and efficient analgesia might prevent these complications. In these patients hemodynamic stress responses like hypertension and tachycardia might develop as a reflex to endotracheal intubation or surgical intervention itself. Insufflation of carbon dioxide into peritoneal cavity might also trigger this response. Plasma concentrations of stress hormones might also increase secondary to side effects of some anesthetic agents. Hemodynamic instability is an important triggering factor for PNV.¹ Different techniques or anesthetic agents could be used to decrease hemodynamic response and related postoperative complications.²⁻⁴ Increasing volatile anesthetic concentrations and/or opioid usage are some methods that could be preferred.² However intraoperative opioids might also delay postoperative recovery and increase PNV rates. Sympatholytic agents decrease hemodynamic response and so requirement for opioids. These agents are alternatives for opioids and also might decrease requirements for

intravenous or inhalation anesthetics.²⁻⁸ In this study we aimed to analyze effects of esmolol, a cardioselective beta-1 (β_1) adrenergic receptor antagonist, on intraoperative anesthetic-postoperative analgesic requirements, postoperative pain and PNV.

Methodology

Study was designed as a prospective study after approval from local ethical committee (KA174-09012013). 60 patients aged between 18 and 60 years who underwent laparoscopic cholecystectomy have been included. Exclusion criterias were as follows; previously known cardiovascular disease, severe hemodynamical instability during operation [mean blood pressure (MBP) <70 mmHg], chronic opioid usage, asthma, being obese or underweighted (body mass index >30 or <18.5), diabetes mellitus, using β blockers or calcium channel blockers. No premedications were used before operation. Electrocardiographic (ECG), invasive intraarterial blood pressures, MBP, peripheral oxygen saturations (SpO_2) vs. bispectral index (BIS) monitorizations were done and recorded as study data. Propofol 2.5 mg/kg, remifentanil 1 μ g/kg and vecuronium 0.1 mg/kg were used for induction in all patients. 50% O_2 and fresh air mixture was used during mechanical ventilation. End-tidal CO_2 (ETCO₂)

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