

A Comparison Between Postoperative Nausea and Vomiting in General Anesthesia With Isoflurane-Remifentanil or Isoflurane in Cholecystectomy Laparoscopic Patients

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Purpose: The purpose of the study was to compare postoperative nausea and vomiting (PONV) between laparoscopic cholecystectomy patients under general anesthesia with isoflurane and remifentanil-isoflurane.

Design: An observational study was used.

Methods: This observational study was performed on 102 patients who were candidates for laparoscopic cholecystectomy under anesthesia with isoflurane or remifentanil-isoflurane. The patients were evaluated for PONV in the PACU and 3 and 6 hours after the operation. Data were analyzed with descriptive and analytical statistics.

Findings: At the time of recovery, the incidence of nausea and vomiting was less in patients under general anesthesia with isoflurane when compared to general anesthesia with remifentanil-isoflurane ($P < .04$). Nausea and vomiting was also less in the isoflurane group (2%) versus the remifentanil-isoflurane group (9%) at 3 and 6 hours after surgery, but the difference was not significant.

Conclusions: The incidence of PONV in cholecystectomy laparoscopic patients under combined remifentanil with isoflurane anesthesia was relatively low, and it was a bit less in patients under isoflurane anesthesia alone.

Keywords: anesthesia, PONV, remifentanil, isoflurane, laparoscopic cholecystectomy, research.

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POSTOPERATIVE NAUSEA AND VOMITING

(PONV) is a common unpleasant postoperative experience that has been reported to occur in 20% to 70% of patients. Its incidence may increase to up to 70% in patients with certain risk factors.¹⁻⁴ Although anesthesia-related mortality has decreased substantially in the recent decades, the patient's desired postoperative status, especially PONV control, has gained importance⁵ because post general anesthesia complications may increase length of stay in the PACU, cause unpleasant experiences, delay patient discharge, and increase the costs of care.^{4,6}

PONV is impacted by different factors including the patient's condition, type of operation, and type of anesthesia.⁷ Risk factors for PONV can be grouped into three categories: patient factors, type of anesthetic drug, and surgery-related factors. Although the literature supports a number of independent risk factors in each of these categories, a subset of factors have been well-established and include history of PONV or motion sickness; female gender; postoperative opioid requirement; nonsmoking status; type of surgery—eye muscle surgery, middle ear surgery, laparoscopic surgery; duration of surgery; anesthetic drugs; and gastric distention–swallowed blood.³

Additional studies identify younger age (< 50 years) as a significant risk factor for PONV. The contribution of intraoperative opioids to PONV is weak. Certain types of surgery may be associated with a frequent incidence of PONV, not because of a specific emetogenic pathway, but as a result of long exposure to general anesthesia and higher doses of opioids. More recent studies suggest laparoscopic, gynecologic, and cholecystectomy surgeries may be risk factors that independently increase the risk for PONV.⁸

PONV is prevalent in laparoscopic cholecystectomy patients with a prevalence of 53% to 72%.⁹ PONV hinders postoperative nursing care. Nurses have a major role in the prevention of PONV by identifying patients at risk. Prevention and effective treatment of PONV improve the patient's condition and result in a more pleasant postoperative experience.¹⁰ According to a study by Sadati et al¹¹, preoperative nursing visits could decrease the level of preoperative anxiety and postoperative complications such as PONV. Therefore, assembling a multidisciplinary specialized team and adopting an appropriate and definitive clinical method to control PONV are necessary.¹²

Type of anesthesia is also a risk factor for PONV. As a result, it is very important to use anesthetics that cause fewer common postoperative complications. Isoflurane is an inhalational anesthetic with more rapid induction of anesthesia and emergence when compared to its predecessors (halothane, enflurane). Although newer agents like sevoflurane and desflurane are less soluble in the blood resulting in more rapid emergence, they are expensive.

Remifentanil is potent selective opioid agonist that is helpful when transient analgesia is desired.³ Remifentanil is of high potency and rapid clearance and lacks accumulation-related problems.⁶ De-esterification by nonspecific plasma and tissue esterase to an inactive acid metabolite accounts for the vast majority of remifentanil's metabolism.⁵ The effect of remifentanil on the incidence of PONV, however, is unclear.⁶ In a systematic review, Komatsu et al¹³ reported that remifentanil had no effect on PONV. Chung et al¹⁴ conducted a study to evaluate the effect of remifentanil combined with isoflurane, enflurane, and propofol and noticed that nausea and vomiting were among the most common complications of remifentanil.

Studies have shown that PONV is more common in general versus regional anesthesia.¹⁵⁻¹⁷ Balanced anesthesia emphasizes the use of several agents to induce unconsciousness and analgesia, relax specific muscles, and eliminate certain reflexes. A combination of intravenous analgesics, neuromuscular blockers, and sedatives is used to achieve balanced anesthesia.³

Ionescu et al¹⁸ compared PONV in patients under anesthesia with isoflurane versus patients receiving total intravenous anesthesia and target controlled infusion. The results showed that the occurrence of PONV was significantly lower in the total intravenous anesthesia and target controlled infusion group.

Khalid et al⁹ evaluated early and late nausea and vomiting in patients who underwent laparoscopic cholecystectomy under anesthesia with isoflurane and propofol. The results showed that PONV was significantly less in the propofol group than the isoflurane group.

According to a study by Oh et al⁶, there was no significant difference in PONV after strabismus surgery between children under anesthesia with sevoflurane and the children who were anesthetized with remifentanil-sevoflurane.

Because different anesthetics are used in different studies and the side effects of anesthesia, especially PONV, may differ according to the type of anesthesia and surgery, we decided to conduct an observational study in Rasoul Akram Hospital,

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