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Original Research Article

Comparative Study of Post-Operative Nausea and Vomiting Between Total Intravenous Anaesthesia and Inhalational Anaesthesia: A Retrospective Study

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Abstract:

Background: The primary consequences of surgical procedures are postoperative nausea and vomiting (PONV). Numerous studies have contrasted total intravenous anesthesia (TIVA) with inhalational anesthesia concerning these two problems. Certain findings indicate improved postoperative recovery circumstances; nevertheless, contradicting data are also present. This study aimed to assess and compare the effects of inhalational and intravenous anesthesia on the incidence and severity of postoperative nausea and vomiting (PONV) in patients following elective laparoscopic surgery.

Methods: This study was conducted as a retrospective analysis. All patients aged 18 to 60, classified as ASA class I and II, who underwent elective laparoscopy and elective procedures conducted under general anesthesia were included. Patients were divided into two groups of intravenous anesthesia and inhalational anesthesia.

Results: A total of 50 patients were administered inhalational anesthesia, while another 50 individuals received intravenous anesthesia. It was disclosed that 52% of patients in the inhalation group and 24% of patients in the intravenous group experienced postoperative nausea and vomiting (PONV). The incidence of PONV was markedly reduced in the TIVA group vs to the inhalation anaesthesia group.

Conclusion: The occurrence of PONV and the necessity for administering an antiemetic rescue medication are markedly reduced in the TIVA group.

Keywords: Surgery, Anaesthetics, PONV, TIVA, motion sickness.

Introduction

Postoperative nausea and vomiting (PONV) are a prevalent and painful consequence subsequent to anesthesia and surgery [1]. Notwithstanding advancements in anaesthetic methods and medication prevention, postoperative nausea and vomiting (PONV) persist in compromising patient comfort, delaying recovery, extending hospital stays, and diminishing overall patient satisfaction [2]. The prevalence of postoperative nausea and vomiting (PONV) is documented to be between 20% and 30% in the general surgical population, escalating to 70% to 80% in high-risk patients [3].

Multiple factors affect the incidence of PONV, including patient-related characteristics (female gender, non-smoking status, history of motion sickness), surgical variables, and anesthetic procedures [4]. The selection of anaesthetic maintenance is crucial. Inhalational anesthetic agents like sevoflurane and isoflurane are recognized contributors to postoperative nausea and vomiting (PONV), but total intravenous anesthesia (TIVA), typically utilizing propofol, is linked to a reduced incidence owing to its inherent antiemetic characteristics [5].

This retrospective study aimed to examine the incidence of postoperative nausea and vomiting in patients administered total intravenous anesthesia vs those receiving inhalational anaesthesia, hence evaluating the influence of anaesthetic method on PONV.

Materials and Methods

Study Design and Setting

This was a retrospective study conducted at Darbhanga Medical College and Hospital following

approval from the institutional ethics committee. Anaesthesia data and postoperative charts were examined for qualifying patients.

Study Population

The research included 100 participants who had elective surgical procedures under general anesthesia. Patients were categorized into two equal cohorts:

- **Group TIVA (n = 50):** Patients who received total intravenous anaesthesia with propofol-based maintenance.
- **Group IA (n = 50):** Patients who received inhalational anaesthesia with volatile agents such as sevoflurane or isoflurane.

Inclusion Criteria

- Patients aged 18–60 years
- American Society of Anesthesiologists (ASA) physical status I–II
- Elective surgeries performed under general anaesthesia

Exclusion Criteria

- Emergency surgeries
- Patients with a known history of motion sickness or previous PONV
- Pregnant patients
- Patients receiving antiemetic prophylaxis pre-operatively
- Patients with gastrointestinal disorders or metabolic illnesses affecting nausea and vomiting

Data Collection: Data extracted from medical records encompassed demographic factors, surgical type, anaesthetic method, anaesthesia duration, and records of nausea and/or vomiting during the initial 24 hours postoperatively. PONV was deemed present if the patient experienced a minimum of one episode of nausea or vomiting during this timeframe.

Statistical Analysis: Data were presented as frequencies and percentages. The incidence of PONV between the two groups was compared using the chi-square test. A p-value less than 0.05 was deemed statistically significant.

Results

The demographic attributes and surgical length were analogous between the two cohorts. The occurrence of postoperative nausea and vomiting was markedly reduced in the TIVA group vs to the inhalational anesthesia group.

- **Group TIVA:** 12 out of 50 patients (24%) experienced PONV
- **Group IA:** 26 out of 50 patients (52%) experienced PONV

Table 1: Comparison of Postoperative Nausea and Vomiting (PONV) Between Groups

Parameter	TIVA Group (n = 50)	Inhalational Anaesthesia Group (n = 50)	p-value
Patients with PONV, n (%)	12 (24%)	26 (52%)	< 0.001
Patients without PONV, n (%)	38 (76%)	24 (48%)	< 0.01
Frequency/severity of vomiting	Lower	Higher	< 0.01

The disparity in the incidence of PONV between the two groups was statistically significant ($p < 0.01$). Episodes of vomiting were more frequent and severe in the inhalational anesthesia group than in the TIVA group.

Discussion

Due to its detrimental effects on patient recovery and satisfaction, post-operative nausea and vomiting continue to be a prominent concern in perioperative treatment [6]. According to the current study, patients undergoing total intravenous anesthesia had a far lower incidence of PONV than those using inhalational anesthesia.

Propofol, the principal drug used in TIVA, possesses natural antiemetic effects, which may explain the lower frequency of PONV [7]. In contrast, volatile anesthetic drugs are known to stimulate the chemoreceptor trigger zone and vestibular system, hence raising the risk of nausea and vomiting [8].

The results of this investigation are in line with earlier studies that shown TIVA's ability to prevent PONV. Additionally, the reduced requirement for rescue antiemetics in the TIVA group shows significant economic benefits and increased post-surgical comfort. Nevertheless, the study's retrospective design restricts control over confounding factors including painkiller use and minute variations in surgical methods.

Conclusion

Prolonged intravenous anesthesia is associated with a much-decreased incidence of post-surgical nausea and vomiting compared to inhalational anaesthesia. Patients at moderate to high risk for PONV may benefit most from the use of TIVA. Larger sample numbers in prospective randomized studies are advised to confirm these results and develop standardized anesthetic procedures meant to reduce PONV.

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