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Original Research Paper

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A COMPARATIVE STUDY TO ASSESS THE EFFECT OF INTRAVENOUS DEXAMETHASONE 8MG IN THE PREVENTION OF POSTOPERATIVE NAUSEA AND VOMITING IN PATIENTS UNDERGOING SURGERY UNDER SUBARACHNOID BLOCK VERSUS PATIENTS UNDERGOING LAPAROSCOPIC SURGERY UNDER GENERAL ANAESTHESIA.

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ABSTRACT

Background: Postoperative nausea and vomiting (PONV) is a common complication that affects surgical patients and can lead to delayed recovery and reduced satisfaction. Dexamethasone, a synthetic corticosteroid, has been shown to possess antiemetic properties. This study evaluates the efficacy of intravenous dexamethasone (8 mg) in preventing PONV among patients undergoing surgery under the subarachnoid block (SAB) compared to those undergoing laparoscopic surgery under general anesthesia (GA). **Aim And Objective:** To assess and compare the efficacy of a single dose of intravenous dexamethasone (8 mg) in reducing the incidence of PONV in patients undergoing surgery under SAB and laparoscopic surgery under GA. **Materials And Methods:** A prospective, observational study was conducted among 104 patients divided into two groups: Group A (SAB) and Group B (GA). Both groups received 8 mg intravenous dexamethasone post-induction. PONV incidence was evaluated at intervals (immediately postoperatively, 2, 4, 8, 12, and 24 hours). The need for rescue antiemetics was recorded. **Results:** Group A exhibited a significantly lower incidence of PONV (20%) compared to Group B (60%) at 24 hours postoperatively ($p < 0.05$). The need for rescue antiemetics was also reduced in Group A compared to Group B (mean doses: 0.5 vs. 1.5, $p < 0.05$). **Conclusion:** Intravenous dexamethasone (8 mg) is effective in preventing PONV in both SAB and GA groups; however, it demonstrated greater efficacy in patients undergoing surgery under SAB. Tailored PONV management strategies should be considered based on the context of surgical and anaesthetic.

KEYWORDS : Dexamethasone, Postoperative Nausea, Vomiting, Subarachnoid Block, General Anaesthesia, Laparoscopic Surgery, Antiemetics, PONV Prevention.

INTRODUCTION

Postoperative nausea and vomiting (PONV) are prevalent and distressing complications affecting surgical patients worldwide. Their incidence varies widely, ranging from 20% to 80%, depending on factors such as the type of surgery, anesthetic technique, and patient-specific risk factors.[1] PONV is not merely an unpleasant side effect; it has significant implications for patient recovery, leading to delayed discharge, unanticipated hospital admissions, and increased healthcare costs.[2] Subarachnoid block (SAB) is often associated with lower PONV rates due to reduced exposure to volatile anesthetics, while laparoscopic surgeries under general anesthesia (GA) carry an inherently higher risk, primarily due to intra-abdominal pressure changes and anesthetic agents.[3,4]

Dexamethasone, a corticosteroid with potent anti-inflammatory and antiemetic properties, has become a cornerstone in PONV prophylaxis.[5] Its mechanism of action in reducing nausea and vomiting is multifactorial, involving central inhibition of prostaglandin synthesis and modulation of the neuroendocrine response to surgery.[6] Despite widespread use, limited data directly compares its efficacy in diverse surgical scenarios, such as SAB versus laparoscopic procedures under GA.

This study addresses this gap by evaluating and comparing the effectiveness of intravenous dexamethasone (8 mg) in preventing PONV across these two distinct surgical and anesthetic settings. By understanding the differential impact of dexamethasone, this research aims to refine PONV management strategies, optimize patient outcomes, and contribute to evidence-based perioperative care practices.

MATERIALS AND METHODS

Study Design And Setting

This study was designed as a prospective, comparative, observational study conducted at a Sri Aurobindo hospital. The research included patients undergoing elective surgeries under the subarachnoid block (SAB) or laparoscopic surgeries under general anesthesia (GA). Ethical clearance was obtained from the institutional ethics committee, and written informed consent was taken from all participants before enrollment.

Study Duration And Sample Size

The study was conducted over 18 months with a sample size of 104, determined using appropriate statistical calculations to ensure adequate power for comparative analysis.

Inclusion And Exclusion Criteria

Patients aged 18 to 60, classified as American Society of Anaesthesiologists (ASA) Grade I or II, and scheduled for elective surgeries under SAB or laparoscopic surgeries under

GA were included. Additional inclusion criteria include lower limb surgeries, urogenital surgeries, abdominal surgeries under SAB group. Exclusion criteria were patients with known allergies to dexamethasone, a history of PONV or motion sickness, pregnancy or lactation, chronic corticosteroid therapy, and severe systemic illnesses classified as ASA Grade III or higher. And abdominal surgeries in GA group

Study Groups

The participants were divided into two groups based on the surgical procedure and anesthetic technique:

1. **Group A:** Patients undergoing surgery under SAB.
2. **Group B:** Patients undergoing laparoscopic surgery under GA.

Intervention

Group A was induced with an intrathecal injection of 0.5% heavy bupivacaine. Group B induction conducted under general anesthesia with appropriate airway management, anaesthetic maintenance, monitoring in accordance with standard protocols. Both groups received Injection dexamethasone 8mg intravenously,

Outcome Measures

The primary outcomes were the occurrence and severity of PONV, assessed immediately upon shifting to the recovery room and at intervals of 2, 4, 8, 12, and 24 hours postoperatively. Secondary outcomes included the number of PONV episodes and the total dose and frequency of rescue antiemetics (ondansetron 4 mg intravenous) used within 24 hours.

Data Collection

Data were collected using a structured proforma, and observations were recorded by trained personnel. The patients self-reported the presence of nausea, while vomiting episodes were documented by the attending staff. If required, the use and dosage of rescue antiemetics were also noted.

Statistical Analysis

Data were analysed using IBM SPSS software version 27.0. Continuous variables were expressed as mean ± standard deviation and compared using the t-test or Mann-Whitney U test, as appropriate. Categorical variables were expressed as frequencies and percentages, and comparisons were made using the chi-square test. A p-value of less than 0.05 was considered statistically significant. This structured methodology ensures reliability, reproducibility, and the ability to draw meaningful conclusions regarding the comparative efficacy of dexamethasone in preventing PONV across the two groups.

RESULTS

The study included 104 patients, 52 in each group: Group A (surgery under subarachnoid block) and Group B (laparoscopic surgery under general anaesthesia). The demographic characteristics of the patients, including age, gender, and ASA grade, were comparable between the two groups ($p > 0.05$).

Table 1: Demographic And Clinical Characteristics Of The Study Groups

Characteristics	Group A (n = 50)	Group B (n = 50)	p-value
Age (years, mean ± SD)	42.8 ± 11.2	41.6 ± 12.0	0.64
Gender (Male/Female)	30/20	28/22	0.72
ASA Grade I/II	35/15	32/18	0.59

Incidence Of Postoperative Nausea And Vomiting (PONV)

The overall incidence of PONV was significantly lower in Group A compared to Group B at all time intervals. In Group A, 10% of patients experienced nausea, and 4% experienced vomiting within the first 24 hours, compared to 38% and 20% in Group B ($p < 0.05$).

Table 2: Incidence Of PONV At Different Time Intervals

Time Interval	Group A: SAB (%)	Group B: GA (%)	p-value
2 hours	6	28	<0.01
4 hours	8	30	<0.01
8 hours	8	32	<0.01
12 hours	10	34	<0.01
24 hours	10	38	<0.01

Use Of Rescue Antiemetics

The need for rescue antiemetics was also significantly lower in Group A. In Group A, only 4% of patients required a single antiemetic dose, while in Group B, 24% required one or more doses ($p < 0.01$).

Table 3: Use Of Rescue Antiemetics In The Two Groups

Rescue Antiemetic Use	Group A: SAB (%)	Group B: GA (%)	p-value
No antiemetic required	96	76	<0.01
1 dose required	4	16	<0.01
≥2 doses required	0	8	<0.01

Comparison Of PONV Incidence At Different Time Points

At 2 hours postoperatively, 6% of Group A patients reported nausea compared to 28% in Group B. This trend persisted throughout the 24-hour observation period (Table 2).

DISCUSSION

The findings of this study indicate that patients undergoing surgery under the subarachnoid block (SAB) experienced a significantly lower incidence of postoperative nausea and vomiting (PONV) compared to those undergoing laparoscopic surgery under general anaesthesia (GA) despite both groups receiving an 8 mg intravenous dose of dexamethasone. These results align with existing literature that underscores the efficacy of dexamethasone in reducing PONV across various surgical contexts.

Dexamethasone is widely recognized for its potent antiemetic properties. A narrative review highlighted its effectiveness in decreasing PONV, pain, and postoperative opioid requirements following both general and spinal anaesthesia. The review emphasized that dexamethasone is routinely used in anaesthesia practice and has been regarded as one of the ideal perioperative agents. [7]

The Fourth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting recommend dexamethasone as a prophylactic antiemetic agent. The guidelines suggest that dexamethasone effectively reduces the incidence of PONV when administered during the induction of anaesthesia. [8]

A study comparing prophylactic treatments for PONV found that the combined use of ondansetron, mosapride, and dexamethasone provided better antiemetic effectiveness, postoperative appetite, and bowel function recovery than other regimens. This suggests that combination therapy, including dexamethasone, may offer enhanced protection against PONV. [8,9]

In the context of SAB, dexamethasone has been shown to reduce PONV effectively. A narrative review noted that dexamethasone reduces postoperative nausea and vomiting, pain, and postoperative opioid requirements after general anaesthesia as well as spinal anaesthesia. [7]

The current study's observation that patients undergoing laparoscopic surgery under GA experienced a higher incidence of PONV aligns with existing literature indicating that GA and laparoscopic procedures are associated with

increased PONV risk. Volatile anaesthetics and increased intra-abdominal pressure during laparoscopy contribute to this heightened risk.

CONCLUSION

This study reaffirms the efficacy of dexamethasone as a reliable agent in reducing the incidence of postoperative nausea and vomiting (PONV) across a variety of surgical settings. Its beneficial effect was observed consistently, highlighting its value as part of routine prophylactic antiemetic protocols. However, a notably higher incidence of PONV was observed in patients undergoing laparoscopic surgeries under general anaesthesia, indicating that dexamethasone alone may not be sufficient in this subgroup.

This finding underscores the complexity of PONV pathophysiology, which may be influenced by factors such as surgical type, anaesthetic technique, and individual patient susceptibility. Laparoscopic procedures, in particular, appear to carry a higher inherent risk due to factors such as pneumoperitoneum, longer operative times, and delayed gastric emptying. As such, a multimodal approach incorporating additional antiemetics—such as 5-HT3 antagonists, NK1 receptor antagonists, or combination therapy—may be warranted to enhance prophylaxis in these patients.

Furthermore, tailoring antiemetic strategies based on specific surgical and anaesthetic contexts, patient risk profiles, and institutional practices may offer more effective and individualized care. Future studies should aim to investigate optimal drug combinations, dosing regimens, and timing of administration to improve PONV outcomes, especially in high-risk populations.

In conclusion, while dexamethasone remains an important tool in the prevention of PONV, its role may be best optimized as part of a comprehensive, risk-adapted antiemetic strategy—particularly in patients undergoing laparoscopic surgery under general anaesthesia.

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