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ORIGINAL ARTICLE

Single dose preoperative dexamethasone in preventing postoperative nausea and vomiting after laparoscopic cholecystectomy.

Muhammad Yaqoob[1], Shehbaz Ahmad[2], Javaid Iqbal[3], Usman Riaz Dab[4]

ABSTRACT… Objective: To evaluate the efficacy of a single dose dexamethasone in preventing postoperative nausea and vomiting (PONV) in patients undergoing laparoscopic cholecystectomy. **Study Design:** This Placebo-controlled, Randomized Trial. **Setting:** Department of Surgery, Allied Hospital-II, Faisalabad, Pakistan. **Period:** June 2025 to August 2025. **Methods:** Sixty patients (30 in each group) undergoing elective laparoscopic cholecystectomy were randomly divided into either Group-A (injected 2ml [8mg] dexamethasone in a 2-mL preparation), and Group-B (injected 2ml of normal saline), at the time of induction. Occurrence of nausea and vomiting during 24-hours following surgery were noted among all patients. **Results:** In a total of 60 patients (30 in each group), 53 (88.3%) were females. In Group-A, 9 (30.0%) patients had nausea during 1st post-operative hour, versus 20 (66.7%) in Group-B. There were 5 (16.7%) patients in Group-A who experience vomiting during 1st hour post-surgery, in comparison to 10 (33.3%) patients in Group-B. In Group-A, 4 (13.3%) patients experienced nausea at 6th post-operative hour, in comparison to 11 (36.7%) patients in Group-B. In Group-A, 1 (3.3%) patient experienced vomiting at 6th post-operative hour, in comparison to 4 (13.3%) patients in Group-B. At 24 postoperative hours, 3 (10.0%) patients in Group-A experienced nausease, versus 4 (13.3%) in Group-B. At 24-hours, 1 (3.3%) patient in Group-A, while 2 (6.7%) patients in Group-B experienced vomiting. Anti-emetic was needed in 2 (6.7%) patients in Group-A, in comparison to 4 (13.3%) in Group-B. **Conclusion:** Pre-surgery single dose of dexamethasone is effective in preventing post laparoscopic cholecystectomy nausea and vomiting up to 24 hours.

Key words: Cholecystectomy, Dexamethasone, Nausea, Surgery, Vomiting.

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INTRODUCTION

Gall bladder stones is a common disease especially in females. For all symptomatic gall stones cholecystectomy is the only treatment. Cholecystectomy can be done either by open which is almost obsolete now except few indications or by laparoscopy.one of common surgical operation done laparoscopically is laparoscopic cholecystectomy.[1] Being minimal invasive laparoscopic cholecystectomy is measured gold standard procedure for gall bladder diseases.[2] There are my advantages of laparoscopic cholecystectomy like minimal scar, less postoperative pain, and early return to work. Although safe in experienced hands, still it is not complication free. In patients undergoing this surgery, postoperative nausea and vomiting (PONV) are frequently reported.[3,4] PONV is disturbing for both patient and surgeon, causes patient's dissatisfaction, delays postoperative recovery, increase medical costs. PONV reportedly affects approximately one third of surgical patients i.e. 20 to 30 % patients suffer from PONV.[5,6] Antiemetics and corticosteroids are recommended for prevention of PONV.[7] Dexamethasone (DEX) is a synthetic glucocorticoid which has immune suppressant and anti-inflammatory properties. Its half-life is 36-72 hours and is helpful in preventing PONV in immediate postoperative period.[8] In addition to preventing PONV, it has additional advantage of reducing postoperative pain as well.[9,10] Its exact mechanism of action remains unclear but DEX has been known for prevention of vomiting.[11]

Despite routine use of antiemetic prophylaxis, PONV rates can remain clinically significant because risk is influenced by anesthesia technique, pneumoperitoneum, opioid requirements, and patient susceptibility. DEX, when given as a single preoperative dose, is an inexpensive and widely available adjunct with proposed antiemetic and

1. MBBS, FCPS, Assistant Professor Surgery, FMU, Faisalabad.
2. MBBS, FCPS, Associate Professor Surgery, FMU, Faisalabad.
3. MBBS, FCPS, FRCS, Professor Surgery, Continental Medical College, Lahore.
4. MBBS, FCPS, Assistant Professor Surgery, FMU, Faisalabad.

Correspondence Address:
Dr. Muhammad Yaqoob
Department of Surgery, FMU, Faisalabad.
dryaqoob@hotmail.com

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opioid-sparing effects through modulation of inflammatory mediators and central antiemetic pathways. However, its effectiveness can vary across settings due to differences in baseline risk profiles, anesthetic/analgesic protocols, and the type and timing of other prophylactic antiemetics used. This study aimed to determine the anti-emetic effect of DEX in the prevention of PONV after laparoscopic cholecystectomy.

METHODS

This double-blind, placebo-controlled trial was conducted at the surgical department of Allied Hospital-II, Faisalabad, Pakistan between June 1st, 2025 and August 31st, 2025. This study was carried out after Institutional Ethical Committee's approval (48/ERC/FMU/2024-25/104), and written informed consents from all patients. Patients age 20-60 years, ASA I or II, and undergoing elective laparoscopic cholecystectomy under general anesthesia were included. History of motion sickness, extreme pain, pregnant women and frequent antiemetic use were exclusion criteria. To randomly select each patients, a computer generated random table of numbers was utilized. The patients in Group-A were injected with DEX 8 mg (2ml) intravenously a minute before anesthesia and the patients in Group-B were injected with 2ml normal saline. To blind the anesthetist and surgeon, one house surgeon made the injections and injected both groups of patients using the same syringes.

All patients received comparable standardized general anesthesia. Propofol (2 mg/kg IV) was used to induce anesthesia, suxamethonium was used as a brief muscle relaxant prior to intubation, and nitrous oxide and isoflurane were used for maintenance. For reversal, atropine and neostigmine were employed. The patients were positioned prone with their right side up in the reverse Trendelenburg posture. CO_2 was used to produce the pneumoperitoneum, and intra-abdominal pressure was kept between 12-14 mm Hg. Following surgery, patients were monitored in the surgical ward for nausea or vomiting at the first, sixth, and twenty-four hours, and the need for an antiemetic medication was noted. When necessary, the medication administered as an antiemetic was metoclopramide or ondansterone.

We analyzed the data by using SPSS Version 31.

RESULTS

In Group-A, 9 (30.0%) patients had nausea during 1st post-operative hour, versus 20 (66.7%) in Group-B. Thee were 5 (16.7%) patients in Group-A who experience vomiting during 1st hour post-surgery, in comparison to 10 (33.3%) patients in Group-B. In Gorup-A, 4 (13.3%) patients experienced nausea at 6th post-operative hour, in comparison to 11 (36.7%) patients in Group-B. In Gorup-A, 1 (3.3%) patient experienced vomiting at 6th post-operative hour, in comparison to 4 (13.3%) patients in Group-B. At 24 postoperative hours, 3 (10.0%) patients in Group-A experienced nausease, versus 4 (13.3%) in Group-B. At 24-hours, 1 (3.3%) patient in Group-A, while 2 (6.7%) patients in Group-B experienced vomiting (Figure-1). Anti-emetic was needed in 2 (6.7%) patients in Group-A, in comparison to 4 (13.3%) in Group-B (Figure-2).

FIGURE-1

Comparison of postoperative nausea and vomiting

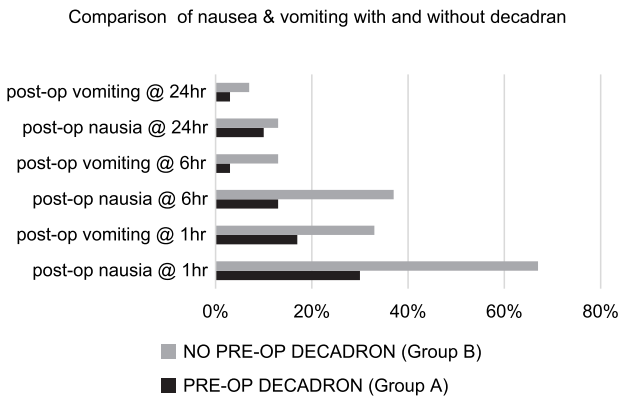
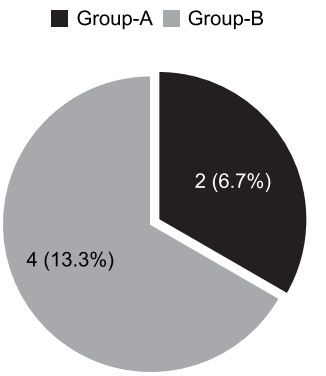


FIGURE-2

Anti-emetic demand between study groups



DISCUSSION

Laparoscopic cholecystectomy is a safe procedure in experienced hands but it is not complication free. PONV is one of the frequently encountered complication in laparoscopic cholecystectomy and cause of distress for patient and may prolong hospital stay.[12,13,14] Although exact aetiology of PONV is not known but possible causes may be insufflation of CO_2, use of nitrous oxide, intraoperative anaesthetic drugs, release of serotonin from the GIT due to manipulation, and female gender.[15-17] There is no ideal single drug for prevention of PONV. DEX has been known due to this.[18]

DEX has been used as a useful antiemetic among cancer patients receiving chemotherapy since 1981. Many researchers have recognized DEX as an effective antiemetic that is on par with or superior to other antiemetic drugs like domperidone, ondansetron, and metoclopramide.[4-7] It has been shown to be successful in numerous pediatric and gynecological procedures in recent research.[8-17] Our research has shown that it is successful in avoiding PONV following laparoscopic cholecystectomy.

Postoperative nausea was noted on 1st postoperative hour, in 66.7% of group B i.e. Placebo group, while only 30.0% patients in DEX group experienced nausea. So there was significant difference in both groups. our this finding is similar to findings of yasuyuki fukami et.al.[19] During 1st postoperative hour 33% patients from group B and 17% from group A experienced vomiting. These findings are consistent with findings of bianchin a who noted significant reduction in postoperative vomiting with preoperative use of DEX.[20] Similarly significant difference was noted in PONV at 6 and 24 hrs postoperative period in both groups. i.e. Group a having less PONV. Thus data analysis shows that preoperative administration reduces PONV after laparoscopic cholecystectomy, and these findings are similar to other studies done in the past.[21,22] DEX is cost-effective and its role in preventing PONV has been described widely, so it can be used regularly at the time of induction in laparoscopic cholecystectomy. The duration of this medication's administration is crucial because it takes many hours for it to have a full and effective effect. So the ideal time is to administer it just before induction of anaesthesia.[23]

Glucocorticoids were not frequently used by surgeons in past due to fear of possible side effects like wound infection, delayed wound healing, and peptic ulcers. Still, it has been found that these adverse effects are very rare with a single dose of DEX and have not been reported in any study in the literature.[20,23,24] Same were findings of our study, that no side effect was noted . There was no delay in wound healing neither wound infections were observed.

Clinically, a single preoperative dose of dexamethasone appears to meaningfully reduce PONV after laparoscopic cholecystectomy, with the clearest benefit in the early postoperative period (first 1–6 hours), which is when nausea and vomiting most commonly delay oral intake, mobilization, and discharge readiness. This supports incorporating dexamethasone as a simple, low-cost prophylactic component of routine anesthesia protocols to improve patient comfort and perioperative recovery while potentially decreasing reliance on rescue antiemetics and related nursing workload. Implementation should remain mindful of steroid precautions, particularly monitoring or avoiding use in patients at risk of significant hyperglycemia or other steroid contraindications.

CONCLUSION

Pre-surgery single dose of dexamethasone is effective in preventing post laparoscopic cholecystectomy nausea and vomiting up to 24 hours.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Muhammad Yaqoob:** Proof reading.
2	**Shehbaz Ahmad:** Manuscript writing.
3	**Javaid Iqbal:** Critical revisions.
4	**Usman Riaz Dab:** Data analysis.