

# Preoperative Use of Dexamethasone in Reducing Vomiting and Hospital Stay in Patients Undergoing Laparoscopic Cholecystectomy

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy despite its minimally invasive nature, leads to high incidence of post operative vomiting, a major cause of morbidity. In routine metoclopramide and dexamethasone are used as an antiemetic but scarce data exists regarding their efficacy.

**Aim:** To determine the preoperative use of dexamethasone in reducing postoperative vomiting and hospital stay in patients undergoing laparoscopic cholecystectomy as compared to metoclopramide.

**Methods:** This randomized trial was carried out at Surgical Outpatient Department of Bahawal Victoria hospital. Total patients in study were one hundred and fourteen. Two groups of patients were made i.e. A and B. After pre-operative preparation of patient for surgery 8 mg of Dexamethasone were given intravenously to group A at the time of induction and 10 mg of metoclopramide was given group B. To see the antiemetic effect of both drugs in reducing vomiting patient was closely observed in post-operative period after every six hours duration in first 24 hours period.

**Results:** The mean age of group A was 42.7±1.24 years and in Group-B, 44.1±1.05 years. There were 25(43.86%) males and 32(56.14%) were females in Group-A while in Group-B, 27(47.37%) were males and 30(52.63%) were females. 17(29%) patients suffered post-operative nausea and vomiting after administration of dexamethasone in Group-A while 33(57%) suffered in group B (metoclopramide) (p value=0.03). When compared the post-operative hospital stay, it was longer i.e. 1.43±0.52 days in Group-A while 2.16±0.65 days in Group B (p value < 0.001).

**Conclusion:** Preoperative use of dexamethasone is more effective in reducing postoperative vomiting and hospital stay in patients undergoing laparoscopic cholecystectomy as compared to metoclopramide.

**Keywords:** Laparoscopic cholecystectomy, metoclopramide, dexamethasone,

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## INTRODUCTION

Acute cholecystitis has been diagnosed in more than 9% of all the patients that are admitted with abdominal pain to the hospital and need critical surgical medication<sup>1</sup> the effective introduction of the laparoscopic surgery has been completely changed the surgical medication of the symptomatic gallstones.<sup>2-4</sup> Optional laparoscopic cholecystectomy (LC) for symptomatic gallstones has almost replaced (>90%) the conventional open procedure (OC), and its safety and effectiveness has been evidenced from many studies<sup>5,6</sup>. The laparoscopic approach for acute cholecystitis (AC) was primary deliberated to be a comparative contraindication<sup>4,5,6,7</sup>.

Open cholecystectomy has been replaced by laparoscopic cholecystectomy as a preferred therapeutic technique for the medication of

cholelithiasis. Due to the expected problems in dissection and the premise of unacceptably high problem rate the existence of the critical cholecystitis was once considered an absolute contraindication to the performance of a laparoscopic cholecystectomy. However, as experience with the procedure has increased and with improvements in available equipment, laparoscopic cholecystectomy is progressively being used as the primary medical approach in the majority of the patients with acute cholecystitis.<sup>7-10</sup> Postoperative nausea and vomiting (PONV) is disagreeable, distressing, and exhausting experience for the patients<sup>11,12,13</sup>. PONV is common in patients (53%–72%) undergoing laparoscopic cholecystectomy (LC) for cholelithiasis.<sup>14-17</sup> Among the expansive ones antiemetics currently prescribed for PONV are serotonin serotonin subtype 3 contenders (e.g. granisetron and ondansetron) (e.g., ondansetron and granisetron) are expensive<sup>8-20</sup>. Other currently consumed less expensive antimetics (e.g. antihistamines, anticholinergics and dopamine receptor antagonists) showed different type of side effects like extrapyramidal symptoms, variations in blood pressure of arteries, restlessness, dry mouth and sedation. one of the less expensive

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and efficient antiemetic medicine is dexamethasone, which is a corticosteroid that has fewer side effects afterward single-dose administration. For the patients receiving cancer chemotherapy, it was considered as an efficient antiemetic in 1981<sup>21</sup>. After chemotherapy, vomiting and nausea has been prevented by dexamethasone on commercial scale<sup>22,23,24</sup>. Occurrence of PONV has been reduced by the dexamethasone. Patients with thyroidectomy were suggested 5 mg of minimum efficient dose of the dexamethasone for PONV but the generally used dose of dexamethasone is 8 to 10 mg. After LC the effective dose of dexamethasone for PONV is 8 mg. However a smaller dose has not yet been determined. The objective of the current research was to determine that preoperative use of dexamethasone is reducing postoperative vomiting and hospital stay in patients undergoing laparoscopic cholecystectomy as compared to metoclopramide.

**PATIENTS AND METHODS**

This randomized trial was carried out at Surgical OPD, BV Hospital. One hundred and fourteen patients with chronic cholecystitis secondary to gall stones were included. The patients who were advised laparoscopic cholecystectomy were divided into two groups A and B. After pre-operative preparation of patient for surgery 8mg of Dexamethasone were given intravenously to group A at the time of induction and 10 mg of metoclopramide was given group B. Patients with head injuries, history of motion sickness and pre-existing medical illness that can precipitate vomiting were excluded. To see the antiemetic effect of both drugs in reducing vomiting patient was closely observed in post operative period by researcher after every six hour duration in first 24 hr period by taking history of vomiting. Post-operative hospital stay of both groups was noted. The data was analyzed by SPSS-20. Proportion of vomiting difference between two groups was assessed by applying Chi square test. The significant values that has been considered was P<0.05.

**RESULTS**

The distribution of the patient according to their age group, majority of the patients 19(33.33%) were recorded between 41-50 years of age, 14(24.56%) were found with 31-40 years, 15(26.32%) with 51-60 years while 9(15.79%) were found between 20-30 years with mean age was 42.7±1.24 years in Group A. While in Group-B, majority of the patients 18(31.58%) were recorded between 41-50 years of age, 16(28.07%) were found with 31-40 years, 12(21.05%) with 51-60 years while only 11(19.30%)

were found between 20-30 years of age with mean age was 44.1±1.05 years. There were 25(43.86%) males and 32(56.14%) females in Group A while in Group-B, 27(47.37%) were males and 30(52.63%) were females (Table 1).

Table no.2 showed the occurrence of the post-operative nausea and vomiting after administration of the drugs, in Group A, 17(29.82%) patients had the positive history of vomiting and 40(70.18%) had no history, while in Group-B 33(57.89%) were found with the history of vomiting and 42.11% had no vomiting, which is significantly higher as compare to Group A (P=0.03). Comparison of post operative hospital stay was also done in this research work where we found 1.43±0.52 days in Group A while 2.16±0.65 days in Group B (P = 0.00) [Table 3].

Table 1: Frequency and percentage of age and genders

Variable	Group A		Group B	
	No.	%	No.	%
<b>Age (years)</b>				
20-31	9	15.79	11	19.30
31-40	14	26.32	16	28.07
41 - 50	19	33.33	18	31.58
51-60	15	26.32	12	21.05
<b>Gender</b>				
Male	25	43.86	27	47.37
Female	32	56.14	30	52.63

Table 2: Frequency of post-operative vomiting

Post-operative vomiting	Group A		Group B	
	No.	%	No.	%
Yes	17	29.82	33	57.89
No	40	70.18	24	42.11
P value	0.03			

Table 3: Comparison of post-operative hospital stay

Hospital stay	Group A	Group B
	1.43±0.52	2.16±0.65
P value	0.00	

**DISCUSSION**

The highly unwanted result of surgery and anesthesia are postoperative nausea and vomiting (PONV). For example postoperative nausea and vomiting (PONV) is one of the most usual difficulties with the occurrence rate of 30% to 50% in the ambulant attention surgery situation.<sup>12</sup> In this situation the patient is not under direct therapeutic examination for treatment of PONV but the recovery process of patient is also extended.<sup>13</sup> Unexpected hospital admittances are resulted from uncontrolled and significant postoperative nausea and vomiting (PONV) in the ambulant attention surgery and post anaesthesia medical unit. Dehydration and electrolyte irregularities may be caused by the persistent vomiting. Stress can be caused upon stitch line by persistent vomiting and retching and hematomas can also be triggered under surgical covers which prone

the patient to the danger of pulmonary embolism of vomiting if the airway reflexes are suppressed from the remaining impacts of analgesic and anesthetic drugs<sup>14</sup>.

Dexamethasone is an effective glucocorticoid and causes anti-inflammatory and palliative impacts. Prophylactic impacts have been reported as a result of postoperative nausea and vomiting (PONV)<sup>15</sup>.

Dexamethasone is found to be effective for the treatment of vomiting and nausea after laparoscopic cholecystectomy. After the cholecystectomy the diagnosis of vomiting and nausea is not completely understood. These episodes are affected by different risk aspects such as post-operative application of PCA morphine, female gender, glycopyrrolate and fentanyl, intra functional application of isoflurane, surgery of gall bladder and long term inhalation of carbon dioxide<sup>16</sup>.

The particular process of the antiemetic operation of the dexamethasone is unknown. Although there are some recommendations for antiemetic operation such as variations in the permeability of the blood (barrier of the brain to the proteins of serum), crucial inhibition of the prostaglandin synthesis, peripheral and central inhibition of the formation or secretions from serotonin.

Prophylactic dosage of the dexamethasone is 8 to 10mg IV can be efficient for the prevention of the vomiting and nausea with comparatively 4 mg. Pre induction of the dexamethasone is proved to be more effective rather than injecting it after the introduction of the anaesthesia.

Pappas et al found in double blind, randomized and prospective study that the incidence of the postoperative nausea and vomiting (PONV) has been significantly reduced by the dexamethasone within 24 hours<sup>22</sup>.

Liu et al also reported in the analogous study that the total occurrence of the vomiting has been effectively reduced from 63.3% to 20% ( $p < 0.01$ ) by the administration of dexamethasone<sup>23</sup>.

Preventive impacts of pre-surgical application of dexamethasone on postoperative nausea and vomiting (PONV) has been reported in many previous placebo controlled examinations. Feo et al reported in another study on laparoscopic medicated patients, that the occurrence of vomiting and nausea in placebo class was 46% and in the dexamethasone class it was 14%<sup>24</sup>.

In the current study we found a significant decrease in the number of the postoperative nausea and vomiting (PONV) in patients administered with dexamethasone as compared to metoclopramide after performing laparoscopic cholecystectomy.

In a study conducted by Mesek Adam V, Grizeli-Stojcic E, incidence of postoperative vomiting with metoclopramide is high such as 45% and with dexamethasone is comparatively low such as 23% when used preoperatively<sup>25</sup>.

Bisgaard T, Klarskov B, Kehlet H, Rosenberg J showed resumption of recreational activities significantly faster after use of dexamethasone these results are also in agreement with the current study, as dexamethasone significantly reduces hospital stay and enables the patients for early resumption of their routine activities<sup>26</sup>.

The limitation of this study was that we didn't compare any side effects of both the drugs, further studies must be conducted with the view to determine any adverse/side effect of the drug so that more confidence may be developed for administration of dexamethasone pre-operatively for performing laparoscopic cholecystectomy.

## CONCLUSION

Considering the results of the current study and international studies as well, preoperative use of dexamethasone in reducing postoperative vomiting and hospital stay in patients undergoing laparoscopic cholecystectomy as compared to metoclopramide is more effective. Under provided number of patients the initial hypothesis is rejected and concluded that bipolar diathermy hemorrhoidectomy is better in terms of mean operating time and mean post op. pain than harmonic scalpel hemorrhoidectomy.

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