ORIGINAL ARTICLE

# Comparison between dexamethasone and placebo in preventing nausea and vomiting in patients undergoing laproscopic cholecyctectomy

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**Abstract**

**Objective:** The aim of the study was to compare between dexamethasone and placebo in preventing postoperative nausea and vomiting (PONV) in patients undergoing laproscopic cholecystectomy.

**Study design:** Interventional experimental study

**Place and duration of surgery:** This study was conducted in Anaesthesia Department of Lyari General Hospital Karachi over a period of 6 months from October 2008 to March 2009.

**Patients and methods:** In this study, sixty patients were equally divided into two groups. Group I (n=30) received 6 mg dexamethasone (2 ml) intravenously and group II (n=30) received normal saline 2 ml as placebo just before induction of anaesthesia. There were no significant differences in age, sex and weight of the patients. The comparison was made between group I and group II. All the patients were observed for any incidence of PONV for one hour in recovery area and subsequently PONV was assessed at 12th hour and 24th hour in wards.

**Result:** Out of 60 patients there were 23 males and 37 females with male to female ratio of 1: 1.60. In group I the average age of the patients was 43.02+/-11.04 while in group II the average age was 42.16+/-10.08; the mean difference was not statistically significant between groups ( P=0.73). Mean weight of the patients in group I was 64.64+/-10.16 and in group II was 60.46+/-12.62 (table 1). In recovery area 2 patients in group I and 8 patients in group II reported PONV. During 12 hours post operatively 7 patients in group I and 13 patients in group II experienced PONV. In next 12 hours 4 patients in group I and 6 patients in group II experienced PONV.

**Conclusion:** Dexamethasone is effective in decreasing PONV when given pre operatively in patients undergoing laproscopic cholecystectomy.

**Key Words:** Dexamethasone, Post Operative Nausea and Vomiting (PONV)

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**Introduction:**

Post operative nausea and vomiting (PONV) is one of the most common complications regarding anaesthesia and surgery. Resumption of normal activities and readiniess to return to work may be delayed if PONV is prolonged. Nausea is a feeling of discomfort in the epigastrium with a conscious desire to vomit and is characterized by contraction of the duodenum and by slowing of gastric motility and emptying while vomiting is the forceful ejection of partially digested food and secretions from the upper gastrointestinal tract. Both components of PONV have the potential to hinder patient recovery.

There are many potential benefits for exploring the issue of the effect of dexamethasone on PONV. Postoperative nausea and vomiting is one of the commonest complaints following anaesthesia and can result in such cases of morbidity as wound dehiscence, bleeding, pulmonary aspiration of gastric contents, fluid and electrolyte disturbances, delayed hospital discharge, unexpected hospital admission and decreased patient satisfaction.

There are various causes of PONV like laryngeal stimulation, anaesthetic agents, gastro intestinal distension, abdominal pain, opioids[1], hypoxia, hypotension, vestibular stimulation and psychological factors.[2]

There are certain predisposing factors which may result in PONV like very young age, menstruation[3], obesity, female gender [4], recent food intake, unskilled anesthetist[5], anaesthesia of long duration[6], history of motion sickness and type of surgery. [7]

There are many drugs which have been used for prophylaxis and treatmeant of PONV like anticholinergics[8], hydroxytryptamine antagonists[9], butyrophenones[10], benzodiazepines[11], phenothiazines[12] and antihistamines.[13]

Cyclizine and metoclopramide are the most commonly used drugs for PONV in clinical practice.

In our study the dexamethasone is used for the management of PONV as its efficacy is acknowledged in the treatment of chemotherapy induced emesis. It appears to be the most effective when administered prior to induction anaesthesia at a recommended dose of 5-10 mg in adults and 150 μg/kg in children.

**Patients and methods:**

This study was conducted in Anaesthesia Department of Lyari General Hospital, Karachi after approval from competent authority over a period of 6 months from October 2008 to March 2009. Sixty patients belonging to ASA I and II, undergoing elective surgical procedure, were included. Informed consent was taken from the patients at pre-anaesthetic visit. Patients were reassured to reduce anxiety. Following patients were included and excluded.

Inclusion Criteria:

1. ASA I and II
2. Age 18 years and above
3. Both males and female
4. Elective laproscopic cholecystectomy

Exclusion Criteria:

1. Patient refusal
2. Change to open cholecystectomy
3. History of Diabetes Mellitus
4. History of taking anti emetic 24 hours before surgery
5. ASA III and IV

These 60 patients were divided into two groups randomly by balloting: Group I and group II. Group I (n=30) received 6 mg dexamethasone (2 ml) intravenously and group II (n=30) received normal saline 2ml as placebo just before induction. After receiving patient in operation theatre, an intravenous line was taken and Ringers lactate drip was started and 2ml of either solution was given according to the group. Induction of anaesthesia was done with thiopental sodium 5 mg/kg, atracurium0.5 mg/kg and nalbuphine 0.1mg/kg. After 3 minutes of induction, laryngoscopy and intubation was done and patient was put on ventilator. A nasogastric tube was also passed. Anaesthesia was maintained with isoflurane with 50% nitrous oxide in oxygen. Intermittent doses atracurium were given during the surgery. At the end of the surgery inj diclofenac sodium 75 mg I/M was given to provide post operative analgesia. Nasogastric tube was removed after suctioning. Patients were reversed with neostigmine and atropine and were extubated. All the patients were shifted to recovery room and were observed for any incidence of PONV for one hour in recovery area and subsequently PONV was assessed at 12th hour and 24th hour in wards. Nausea and vomiting, if occurred, was treated with inj metaclopramide 10 mg intravenously.

Statistical analysis:

Statistical analysis was done using SPSS version 10 on computer. Values are presented in mean +/- standard deviation for variables like age and weight. ANOVA test was used to compare mean difference among groups for different variables. Chi-square test was also applied to compare proportion difference among groups for shivering. P-value of less than 0.05 was taken as significant.

**Results:**

In this study, sixty patients were equally divided into two groups. Group I (n=30) received 6 mg dexamethasone (2 ml) intravenously and group II (n=30) received normal saline 2 ml as placebo just before induction of anaesthesia.

Out of 60 patients there were 23 males and 37 females with male to female ratio of 1: 1.60. In group I the average age of the patients was 43.02+/-11.04 while in group II the average age was 42.16+/-10.08; the mean difference was not statistically significant between groups (P=0.73). Mean weight of the patients in group I was 64.64+/-10.16 and in group II was 60.46+/-12.62 (Table 1). Mean comparison between groups for duration of anaesthesia showed it to be statistically insignificant as shown in Table 1 (P=0.06). In recovery area, 2 patients in group I and 8 patients in group II reported PONV (P=0.01). During 12 hours post operatively 7 patients in group I and 13patients in group II experienced PONV; there was no statistical significance between the two groups (P>0.05). In next 12 hours 4 patients in group I and 6 patients in group II experienced PONV.

**Discussion:**

Postoperative nausea and vomiting (PONV) are the most common complaints after anesthesia and surgery. Patients often perceive PONV as one of the most bothersome anesthesia-related adverse effects and may consider it as distressing as the pain associated with the surgical procedure[14]. Patients with PONV consume more resources and require additional health care professional time compared with patients in whom these complications are avoided.After laproscopic surgeries the incidence of PONV is reported to be as high as 53-72 % which can be reduce by administering antiemetics. The management of PONV requires a multimodal approach which can include the use of less emetogenic anaesthetic techniques, balanced analgaesia, appropriate intravenous hydration and possible non pharmacologic methods. This might include considerations such as the placement of nasogastric tubes to facilitate gastric emptying, fasting times and oxygen administration for example. There is a large list of drugs which have been used as anti emetics and dexamethasone is one of them. Dexamethasone is a steroid which produces its antiemetic effects through unknown mechanism but the effects are probably centrally mediated via inhibition of prostaglandin synthesis or inhibition of the release of endogenous opioids.[15] In this study we evaluated the antiemetic effect of intravenous dexamethasone compared with saline in the prevention of nausea and vomiting after laparoscopic cholecystectomy and found it to be effective in this regard.

The results of our study have been supported by other studies as well. Wang et al [16] found that 10% of patients in the dexamethasone group compared with 34% in the saline group reported vomiting (P < 0.05). Of note, the total incidence of nausea and vomiting was 23% in the dexamethasone group and 63% in the saline group (P < 0.001). In another study, Bisgaard et al [17] found that during the first 6 postoperative hours, the incidence and severity of nausea was significantly lower (P < 0.05) in the dexamethasone group, and vomiting was significantly reduced during the entire 0 through 24-hour period compared with placebo (P < 0.05).

Elhakim et al [18], Aouad et al [19] and Pappas et al[20] in their studies reported that children who received intravenous dexamethasone preopera-

Table 1: *Demographic and clinical characteristics of the patients*

| Variables | Group I (n=30) Mean ± SD | Group II (n=30) Mean ± SD | P value |
|---|---|---|---|
| Age (years) | 43.02+/-11.04 | 42.16+/-10.08 | 0.73 |
| Weight (kilograms) | 64.64+/-10.16 | 60.46+/-12.62 | 0.01 |
| Duration of Anaesthesia (minutes) | 69.53+/-12.46 | 72.44+/-15.81 | 0.06 |

*Values were considered significant when p < 0.05.*
*Data presented in mean+/-standard deviation*

Table 2: *Comparison of PONV between groups I and II at different time intervals*

| Variables | Group I (n=30) Mean ± SD | Group II (n=30) Mean ± SD | P value |
|---|---|---|---|
| Recovery Room | 2 (6.66 %) | 8 (26.66) | 0.005 |
| Within 12hours | 7 (23.3 %) | 13 (43.3 %) | 0.005 |
| Within 24 hours | 4 ( 13.3%) | 6 (20.0 %) | 0.005 |

*Values were considered significant when p < 0.05.*
*Data presented in mean+/-standard deviation*

tively had significantly lower episodes of vomiting in the 24-hours following surgery compared with children who received the placebo dose of normal saline.

Biswas and colleagues reported the incidence of PONV with placebo upto 63% compared to 37 % with dexamethasone ($P<0.05$).

All the patients in our study were anaesthetized with standard anaesthetic regime and surgical procedure. The duration of anaesthesia was similar in both the groups. So it was most likely that the difference in the incidence of PONV between the two groups was attributable to dexamethasone rather than any other variables. As the drug is freely available economical and the single dose is not associated with any significant side effect it should therefore be used more frequently in patients undergoing laproscopic cholecystectomy.

**Conclusion:**

Therefore, based on our study results, we can conclude that dexamethasone when given preoperatively significantly decreases the PONV in patients undergoing laproscopic cholecystectomy.

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