ORIGINAL ARTICLE

Comparison of Use of Metoclopramide Alone and in Combination with Dexamethasone for Prevention of Post Operative Nausea and Vomiting in Laparoscopic Cholecystectomy

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ABSTRACT

Objective: To compare the efficacy of intravenous metoclopramide alone and in combination with dexamethasone for preventing nausea and vomiting (PONV) in the postoperative period in patients undergoing laparoscopic cholecystectomy.
Study design: Single blinded, randomized, interventional study.
Place and duration of study: This study was conducted in the department of Anesthesiology Bahawal Victoria Hospital Bahawalpur from May 2010 to May 2011.
Patients and methods: After the approval from the ethical committee of the hospital, the study was conducted on 100 patients who were randomly divided into two groups A and B, each group containing 50 patients. All belonged to 25-40 years of age and A.S.A-I. Randomization was done by envelope draw method. The patients received metoclopramide 10mg alone or metoclopramide 5mg plus dexamethasone 4mg IV, 30 minutes before the induction of anesthesia. All the patients were given general anesthesia with endotracheal intubation using thiopentone sodium, succinylcholine and maintained with isoflurane and N_2O with O_2 in both groups. PONV were evaluated postoperatively.
Results: Significantly less nausea and vomiting was noted in the first 24 h after surgery, in the patients of group B who received metoclopramide plus dexamethasone as compared to the patients in group A who received only metoclopramide
Conclusion: In this study, a single dose of metoclopramide 5mg plus dexamethasone 4 mg produced better antiemetic effects after laparoscopic cholecystectomy than metoclopramide 10 mg alone.
Key words: PONV, dexamethasone, metoclopramide, laparoscopic cholicystectomy.

INTRODUCTION

Postoperative nausea and vomiting (PONV) is among the most unpleasant experiences associated with anaesthesia and surgery[1,2]. It is popularly referred to as the "Big Little Problem". Persistent nausea and vomiting can lead to dehydration and electrolyte imbalance and on the other hand there is a risk of aspiration of gastric contents leading to aspiration pneumonitis and death. Extremely forceful vomiting may also leads to the wound rupture and rupture of esophagus. There are certain factors that can predispose the patients to PONV. These include young age, female gender, obesity, prolonged fasting, recent food intake, history of previous nausea and vomiting, history of motion sickness, long duration and depth of anesthesia and the type of surgical procedures[3,4]. Patients undergoing laparoscopic cholecystectomy, who are not given prophylaxis, are frequently exposed to increased risk (40-85%) of postoperative nausea and vomiting[5]. The risk factors are intraoperative use of volatile anaesthetic[6] opioids[7] and postoperative pain[8]. A number of agents have been tried to decrease the incidence of PONV. Recently, $5HT_3$ antagonist such as ondansetron and granisetron are the most popular used for this purpose. However, their cost is one of the drawbacks especially in public sector hospitals. Although other cost effective antiemetics like metoclopramide has also been shown to be an effective and safe drug for both prevention and treatment of post-operative nausea and vomiting[9]. Although this drug is effective in reducing nausea, and vomiting, it can produce other side effects including acute dystonia, Parkinsonism, malignant neuroleptic syndrome and catatonia in some patients. Therefore it is advisable to find a method using a smaller dose which would not induce such complications. Dexamethasone has been used as an antiemetic for more than 20 years in patients undergoing chemotherapy with limited side effects. Dexamethasone in a dose of 8-10mg can prevent PONV after various surgical procedures associated with high incidence of PONV. Further, the antiemetic effect of dexamethasone is reported to be equal to or better than $5HT_3$ receptor antagonists. The exact mechanism of action of dexamethasone for the

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prevention of PONV is not known. Probably it involves prostaglandin antagonism, serotonin inhibition in gut[13], release of endorphins and its anti-inflammatory membrane stabilizing effect may be the cause of its antiemetic effect[10]. Also a single dose of dexamethasone is considered to be safe[16]. Laparoscopic cholecystectomy is one of the frequently performed procedure in the general surgical lists in Bahawal Victoria Hospital Bahawalpur but there is no local study to document the effectiveness of dexamethasone in prevention of PONV. So this study was designed in patients undergoing Laparoscopic cholecystectomy to compare the efficacy of preoperative administration of metoclopramide plus dexamethasone for lowering the incidence and severity of PONV.

PATIENTS AND METHODS

This study was conducted in the Department of Anesthesiology Bahawal Victoria Hospital Bahawalpur from May 2010 to May 2011. It was a prospective, single blinded, randomized, interventional study. Written informed consent was obtained from the entire patient. 100 patients, 25-40 years of age, ASA physical status I, who were scheduled for laparoscopic cholecystectomy were included in the study. Patients who received antiemetic, steroid or history of allergy to metoclopramide or dexamethasone were excluded from the study. The patients were divided randomly into two groups to receive metoclopramide 10mg alone or dexamethasone 4mg plus metoclopramide 5 mg in a double blind fashion from coded syringes of 3 ml IV, 30 minutes before the induction of anesthesia. After establishing standard monitoring general anesthesia was induced with, Thiopental sodium 6mg/kg and Succinylcholine 2mg/kg and maintained with 50% N_2O in Oxygen and 1 MAC of Isoflourane. Muscle relaxation was obtained using Atracurium. No other intraoperative and postoperative drugs were permitted. Patients were visited 1, 2, 4, 6, 12, 18 and 24 hours after operation by one of the investigators blinded for the type of intervention for data collection. Any episode of PONV during the first 24 hours was noted. The data were analyzed by using students't-test for parametric data and the Mann Whitney U-test or 2 tests for non-parametric data, and a p value < 0.05 regarded as significant.

RESULTS

There were no significant differences between the two groups with respect to age and gender distribution. (Table 1)

In the first 6 hours postoperative observation period, significantly less PONV occurred in the metoclopramide plus dexamethasone group. Only 5(10%) patients experienced any nausea or vomiting in group B (metoclopramide plus dexamethasone), versus 18(36%) in metoclopramide group. In next post operative period again the incidence of PONV remained less in metoclopramide plus dexamethasone group. In first 24 hours post operative period the incidence of PONV was significantly less. Only 13(26%) patients experienced nausea or vomiting in group B (metoclopramide plus dexamethasone), versus 32(64%) in metoclopramide group (Table 2).

Table 1: Demographic data

	Group A Metoclopramide (n= 50)	**Group B** Metoclopramide+ Dexamethasone (n=50)
Age	6±32 years	4.5±35 years
Male Female	12 38	18 32

Table 2: Incidence of PONV

PONV	**Group A** Metoclopramide (n=50)	**Group B** Metoclopramide+ Dexa-methasone (n=50)
0-6 Hours 7-12 Hours 13-24 Hours	18(36%) 5(10%) 8(16%)	6(12%) 3(6%) 4(8%)
Total	31(62%)	13(26%)

PONV = Post operative nausea and vomiting

DISCUSSION

Patients undergoing laparoscopic cholecystectomy are at high risk of developing PONV. To minimize PONV anesthesiologists have focused primarily on anesthetic techniques with minimal emetic potential and on the administration of different antiemetic drugs or combination of them[11]. On the other hand we did not find any reports about using the combination of metoclopramide and dexamethasone versus dexamethasone or metoclopramide on the incidence of vomiting after laparoscopic cholecystectomy. In a prospective, randomized, double-blind study Pappas et al. found that dexamethasone had significantly decreased the incidence of PONV in the 24 hours after discharge in children undergoing adenotonsillectomy[12,13]. In a similar investigation Liu et al[14,15] also found that dexamethasone was effective in reducing the overall incidence of vomiting from 63.3% to 20% ($p<0.01$).

On the other hand Splinter et al. had reported that low dose ondansetron with dexamethasone more effectively decreased vomiting after strabismus surgery in children than high dose ondansetron. Whiles Goedhals et al. had reported that granisetron plus dexamethasone did not appear to confer an additional benefit over use of dexamethasone alone in controlling delayed nausea and vomiting following cisplatin chemotherapy[16,17]. PONV is a multifactorial problem and several anesthetic and non-anesthetic factors must be standardized to examine the antiemetic potential of any specific drug [18]. In the present study, the anesthetic technique, amount of IV hydration, narcotic analgesic dose and antiemetic therapy were standardized. Data from the present study indicate that in patients undergoing laparoscopic cholecystectomy, a single combination dose of IV dexamethasone 4 mg plus metoclopramide 5mg 30 minutes before the induction of anesthesia decreased PONV during the first 24 hours. Complications from corticosteroid therapy are typically related to its long term use and risks of steroid therapy of less than 24 hours duration are negligible[19].

CONCLUSION

We conclude that use of single dose of metoclopramide 5mg plus dexamethasone 4mg produces better antiemetic effects than metoclopramide 10mg alone after laparoscopic cholecystectomy.

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