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A COMPARATIVE STUDY OF METOCLOPRAMIDE ALONE AND IN MIXTURE WITH DEXAMETHASONE FOR DETERRENCE OF POST-OPERATIVE NAUSEA AND VOMITING AFTER LAPAROSCOPIC CHOLECYSTECTOMY

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Abstract:

Aim: *To compare the efficacy of intravenous administration of metoclopramide alone and in combination with dexamethasone in the prevention of postoperative nausea and vomiting (PONV) in patients undergoing laparoscopic cholecystectomy.*

Study design: *randomized, single-blind, intervention study.*

Place and Duration of Study: *This study was conducted at the Surgical department of Allied Hospital Faisalabad for one-year duration from March 2019 to March 2020.*

Patients and methods: *After obtaining the approval of the hospital's ethics committee, the study was conducted on 100 patients who were randomly divided into two groups A and B, 50 people in each group. They all belonged to the age of 25-40. Randomization was performed using the envelope randomization method. Patients received metoclopramide 10 mg alone or metoclopramide 5 mg and dexamethasone 4 mg intravenously 30 minutes prior to induction of anesthesia. All patients were subjected to general anesthesia with endotracheal intubation with sodium thiopentone and succinylcholine and was maintained with isoflurane and N2O with O2 in both groups. PONV was assessed after surgery.*

Results: *Patients in group B who received metoclopramide in combination with dexamethasone had significantly less nausea and vomiting in the first 24 hours after surgery compared to patients in group A who received only metoclopramide.*

Conclusion: *In this study, a single dose of 5 mg metoclopramide and 4 mg dexamethasone produced a better antiemetic effect after laparoscopic cholecystectomy than 10 mg metoclopramide alone.*

Keywords: *PONV, dexamethasone, metoclopramide, laparoscopic cholecystectomy.*

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INTRODUCTION:

Post-operative nausea and vomiting (PONV) are among the most unpleasant experiences associated with anesthesia and surgery. It is commonly referred to as "the big little problem." Persistent nausea and vomiting may lead to dehydration and electrolyte imbalance, on the other hand, there is a risk of aspiration of gastric contents leading to aspiration pneumonia and death [1-2]. Extremely vomiting can also lead to wound rupture and esophageal rupture. There are certain factors that may predispose patients to PONV. These include young age, female gender, obesity, prolonged fasting, recent food consumption, history of prior nausea and vomiting, history of motion sickness, long duration and depth of anesthesia, and type of surgery [3-4]. Patients undergoing laparoscopic cholecystectomy who are not under prophylaxis are often at increased risk (40–85%) of postoperative nausea and vomiting. Risk factors include the intraoperative use of volatile anesthetic opioids and postoperative pain. Attempts have been made to reduce the incidence of PONV. 5HT3 antagonists such as ondansetron are the most popular recently used for this purpose. However, their cost is one of the drawbacks, especially in public sector hospitals [5-6]. While other cost-effective antiemetics such as metoclopramide have also been shown to be an effective and safe drug in both the prevention and treatment of postoperative nausea and vomiting [7-8]. Although this drug is effective in reducing nausea and vomiting, it may cause other side effects, including acute dystonia, parkinsonism, neuroleptic malignant syndrome, and catatonia in some patients. Therefore, it is advisable to find a method with a lower dose that does not cause such complications. Dexamethasone has been used as an anti-emetic for over 20 years in patients undergoing chemotherapy with limited side effects. Dexamethasone 8-10 mg may prevent PONV following various surgical procedures associated with the high incidence of PONV. Furthermore, it has been reported that the antiemetic effect of dexamethasone is equal to or better than that of 5HT3 receptor antagonists. The exact way dexamethasone works in preventing PONV is unknown[9-10]. This is possibly related to prostaglandin antagonism, intestinal serotonin suppression, release of endorphins, and the anti-inflammatory membrane stabilizing effect may account for its anti-emetic effect. A single dose of dexamethasone is also considered safe. Laparoscopic cholecystectomy is one of the treatments frequently performed on the general surgical lists at Bahawal Victoria Hospital Bahawalpur, but there is no local study documenting the effectiveness of dexamethasone in preventing PONV. Therefore, this study was designed in patients undergoing laparoscopic cholecystectomy to compare the effectiveness of preoperative metoclopramide with dexamethasone in reducing the incidence and severity of PONV.

PATIENTS AND METHODS:

This study was conducted at the Surgical department of Allied Hospital Faisalabad for one-year duration from March 2019 to March 2020. It was a prospective, randomized, single-blind, intervention study. Written informed consent was obtained from the entire patient. The study included 100 patients aged 25-40 who were qualified for laparoscopic cholecystectomy. Patients who had received antiemetics, steroids or had a history of allergy to metoclopramide or dexamethasone were excluded from the study. Patients were randomized into two groups to receive either metoclopramide 10 mg monotherapy or dexamethasone 4 mg and metoclopramide 5 mg in a double-blind test with coded 3 ml IV syringes, 30 minutes prior to induction of anesthesia. After standard monitoring was established, general anesthesia was induced with thiopental 6 mg / kg and succinylcholine 2 mg / kg and maintained with 50% N2O in oxygen and 1 MAC of isoflurane. Muscle relaxation was achieved with Atracurium. No other intraoperative and postoperative medications were allowed. Patients were visited 1, 2, 4, 6, 12, 18, and 24 hours postoperatively by one of the investigators blinded to the type of intervention to collect data. Each PONV episode in the first 24 hours was recorded. Data were analyzed using the Student's Test for parametric data and the Mann Whitney U test or 2 tests for nonparametric data, with a p value of <0.05 considered significant.

RESULTS:

There were no significant differences between the two groups in terms of age and gender distribution. (Table 1) Significantly less PONV occurred in the group receiving metoclopramide and dexamethasone in the first 6 hours of postoperative observation. Only 5 (10%) patients experienced nausea or vomiting in group B (metoclopramide plus dexamethasone), compared with 18 (36%) in the metoclopramide group. In the following postoperative period, the incidence of PONV again remained lower in the metoclopramide and dexamethasone groups. In the first 24 hours after surgery, the incidence of PONV was significantly lower. Only 13 (26%) patients experienced nausea or vomiting in group B (metoclopramide plus dexamethasone), compared with 32 (64%) in the 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%)

DISCUSSION:

Patients undergoing laparoscopic cholecystectomy are at high risk of developing PONV. To minimize PONV, anesthetists focused primarily on anesthesia techniques with minimal emetic potential and the administration of various antiemetics or combinations thereof. On the other hand, we found no reports of the use of a combination of metoclopramide and dexamethasone compared to dexamethasone or metoclopramide in the incidence of vomiting after laparoscopic cholecystectomy [11-12]. In a prospective, randomized, double-blind study, Pappas et al. Found that dexamethasone significantly reduced the incidence of PONV within 24 hours after discharge in children undergoing adenotonsillectomy. In a similar study, Liu et al. 14,15 also found that dexamethasone was effective in reducing the overall rate of vomiting from 63.3% to 20% ($p < 0.01$).

On the other hand, Splinter et al. Reported that a low dose of ondansetron with dexamethasone was more effective in reducing vomiting after strabismus surgery in children than a high dose of ondansetron. Whiles Goedhals et al. reported that granisetron and dexamethasone did not appear to provide additional benefit compared to the use of dexamethasone alone in controlling delayed nausea and vomiting after cisplatin chemotherapy [13-14]. PONV is a multifactorial problem, and several anesthetic and other factors need to be harmonized to investigate the antiemetic potential of each specific drug. This study standardized the technique of anesthesia, the degree of intravenous hydration, the dose of narcotic analgesic, and anti-emetic therapy. Data from this study show that in patients undergoing laparoscopic cholecystectomy, a single dose of 4 mg intravenous dexamethasone in combination with 5 mg metoclopramide 30 minutes prior to induction of anesthesia decreased PONV in the first 24 hours [15]. Complications of treatment with corticosteroids are usually associated with long-term use, and the risk of treatment with steroids lasting less than 24 hours is negligible.

CONCLUSION:

We conclude that the use of a single dose of 5 mg metoclopramide and 4 mg dexamethasone gives a better antiemetic effect than metoclopramide 10 mg alone after laparoscopic cholecystectomy.

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