Original Research Paper

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Comparison of Granisetron versus Granisetron plus Dexamethasone after Laporoscopic Surgery

Anaesthesiology

KEYWORDS: Postoperative nausea and vomiting, laparoscopic cholecystectomy, Granisetron, Dexamethasone

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ABSTRACT

Postoperative nausea and vomiting, are relatively common after both general and regional anaesthesia. Most of the published trials indicate an improved antiemetic prophylaxis when using a combination of agents acting at different receptor sites, compared with monotherapy. We studied the efficacy of a combination of two antiemetic drugs like Granisetron and Dexamethasone in preventing PONV, after laparoscopic cholecystectomy which has a high incidence of PONV.

AIMS & ABJECTIVES:

PRIMARY OBJECTIVE: To compare the effectiveness of Granisetron and Dexamethasone, with Granisetron alone, for prevention of PONV after laparoscopic cholecystectomy.

SECONDARY OBJECTIVES: To determine any adverse effects in the postoperative period.

MATERIAL & METHOD: Data was collected from 60 ASA I and II patients scheduled for laparoscopic cholecystectomy aged between 20-60 years at ASRAM Medical College Hospital, Eluru..

INCLUSION CRITERIA

Patients with ASA grade 1 and 2 and patients in the age group between age group 20-60 years were included in the study.

EXCLUSION CRITERIA

Patients with documented hypersensitivity to any of the study drugs, patients with history of motion sickness or previous PONV, patients who are pregnant or menstruating, patients who have taken antiemetic drugs within 24 hours before surgery and patients with history of neurological or renal diseases were excluded in our study.

METHODS

The study was a prospective, randomized, double blinded one. Patients were randomly allocated into two groups.

1)Those who received i.v. Granisetron alone (40mcg/kg).(Group G)

2)Those who received i.v. Granisetron(40mcg/kg) and i.v. Dexamethasone 8mg. (Group G plus D) The drugs were given intravenously 5 minutes before induction.

Postoperatively all episodes of PONV experienced by the patient during the first 24 hours after anaesthesia, were recorded by direct questioning. Rescue Antiemetic (Metoclopramide 10mg) was used if patient had nausea or vomiting.

CONCLUSION: The combination (Granisetron plus Dexamethasone) was found to be better in attaining a complete response than Granisetron alone and also adverse effects were less in G+D group than G group. Need for rescue antiemetic is more in Group G compared to group G + D.

INTRODUCTION

Nausea is defined as a subjectively unpleasant sensation associated with an urge to vomit. Vomiting or emesis is the forceful expulsion of gastric contents from the mouth .Persistence of nausea and vomiting in the postoperative patient especially in a patient, who is fasting, can result in dehydration, electrolyte imbalance, and delay discharge especially in ambulatory surgery. Persistent retching and vomiting can cause tension in suture lines, venous hypertension, bleeding under skin flaps and increased risk of pulmonary aspiration of vomitus, if airway reflexes are depressed from the residual effects of anaesthetic and analgesic drugs.

PHYSIOLOGY AND THERAPY OF EMESIS

The act of emesis involves a sequence of events divided into pre-ejection, ejection and post ejection phases.

RISK FACTORS FOR PONV

Female sex, old age, obesity ,History of motion sickness or previous PONV, prolonged surgery, certain procedures (gynaecological surgeries, laparoscopies, middle ear surgeries, strabismus surgeries), anesthetic drugs(opioids, inhalational agents, i.v induction agents), pain etc.

Treatment of PONV

The different classes of antiemetic agents used for PONV include anticholinergic, antihistamines, phenothiazines, sedatives/ anxiolytics, butyrophenones, dopamine antagonists and combinations of these.

Granisetron is a selective 5-hydroxy tryptamine -3(5HT3) receptor antagonist. Serotonin receptors of the 5HT3 type are located peripherally on vagal nerve terminals and centrally in the CTZ of the area postrema. For prevention of PONV Granisetron 40mcg/kg administered by slow intravenous injection prior to induction of anaesthesia. Adverse effects: Headache (9-21%), weakness (5-18%), dizziness (4-5%), rash (1%), constipation (3-9%)etc.

Dexamethasone is a potential synthetic analogue of cortisol. For prevention of PONV dexamethasone 8mg is administered by slow intravenous injection prior to induction of anaesthesia. Adverse effects: osteoporosis ,growth retardation etc.

MATERIALS AND METHODS

SOURCES OF DATA

Data was collected from 60 ASA I and II patients scheduled for laparoscopic cholecystectomy aged between 20-60 years at ASRAM Medical College Hospital, Eluru.The study was conducted over a period of two years, (2014-16) after taking approval from ethical committee of ASRAM, Eluru.

INCLUSION CRITERIA

Patients with ASA grade 1 and 2 and patients in the age group between age group 20-60 years were included in the study.

EXCLUSION CRITERIA

Patients with documented hypersensitivity to any of the study drugs, Patients with history of motion sickness or previous PONV, Patients who are pregnant or menstruating, Patients who have taken

antiemetic drugs within 24 hours before surgery and Patients with history of neurological or renal diseases were excluded in our study.

METHODS

The study was a prospective, randomized, double blinded one. The randomization was done using closed envelope technique. Written informed consent was taken from all patients. IV access was established. Premedication was given with i.v.Ranitidine 50 mg, i.v.Glycopyrrolate 0.2 mg. SpO_2, NIBP, ECG monitors were attached .The baseline values were recorded. Patients were randomly allocated into two groups.

1)Those who received i.v. Granisetron alone (40mcg/kg).(Group G)
2)Those who received i.v. Granisetron(40mcg/kg) and i.v. Dexamethasone 8mg.(Group G plus D)

The drugs were given intravenously 5 minutes before induction of anaesthesia by an anaesthetist who is not involved in the study, for making the study double blinded. Anesthesia was induced with intravenous administration of Propofol 2.5 mg/kg and Fentanyl 2 mcg/kg and Vecuronium Bromide 0.1 mg/kg for muscle relaxation . Diclofenac Sodium 75 mg was given as an added analgesic through intravenous infusion. Proper size cuffed oral endotracheal tube was inserted. Anaesthesia was maintained with N_2O 66%, O_2 33%, Isoflurane 0.4-0.6% and intermittent doses of Vecuronium Bromide . The intraabdominal CO_2 pressure was kept between 13-16 mm of Hg. A nasogastric tube was inserted and suction applied to empty the stomach after intubation and also before extubation. Reversal of muscle relaxation was done with Glycopyrolate 0.01 mg/kg body weight and Neostigmine 0.05 mg /kg and patient was extubated.

Postoperative analgesia was provided by i.m Diclofenac Sodium as required. Pain persisting even after the use of Diclofenac was treated with i.v paracetamol as and when required. Postoperatively all episodes of PONV experienced by the patient during the first 24 hours after anaesthesia, was recorded by direct questioning. Rescue Antiemetic (Metoclopramide 10mg) was used if patient had nausea or vomiting

Statistical Methods

Chi-square / Fisher Exact test has been used to find the significance of incidence of nausea and vomiting between two group of patients

RESULTS

A Comparative study consisting of 60 patients undergoing laparoscopic cholecystectomy under general anaesthesia was undertaken to study the anti emetic efficacy of Granisetron plus Dexamethasone(Group G+D) in relation to Granisetron (Group G) alone with 30 patients in each group. Postoperatively all episodes of PONV experienced by the patient were assessed by a nausea and vomiting score up to 24 hrs after injection of study drug.

Table 1 Comparison of Nausea between two groups

NAUSEA	PACU	
	Group G (n=30)	**Group G+D** (n=30)
Mild	6(20.1%)	1(3.3%)
Moderate	1(3.3%)	1(3.3%)
Severe	1(3.3%)	
No nausea	22(73.3%)	28(93.4%)

In group G 8 patients experienced nausea, whereas in group G+D 2 patients experienced nausea. Incidence of nausea is significantly lower in group G+D when compared to Group G (p=0.038)

Table 2 Comparison of Vomiting between two groups

VOMITING	PACU	
	Group G (n=30)	**Group G+D** (n=30)
Mild	8(20.1%)	1(3.3%)
Moderate	1(3.3%)	
Severe	-	-
No Vomiting	21(70.0%)	29(96.7%)

Incidence of vomiting in group G in PACU was 30%, Incidence of vomiting in group G+D in PACU was 3.3%. Incidence of vomiting is significantly lower in Group G+D when compared to Group G (p=0.012)

Table 3 Comparison of Rescue Antiemetic in two groups

Rescue Antiemetic	Group G	Group G+D
0	21(70.0%)	29(96.7%)
1	9(30.0%)	1(3.3%)

In group G 9 patients received rescue antiemetic (metoclopramide 10mg i.v.) In group G+D one patient received rescue antiemetic. Need for rescue antiemetic is more in Group G compared to group G + D.

Table 4 Comparison of other adverse events in two groups

Adverse events	Group G	Group G+D
Headache	1	-
Drowsiness	-	-
Itching	-	-
Dizziness	-	-

There was an incidence of headache in 1 patient in group G. There was no incidence of any adverse events in group G+D.

DISCUSSION

The incidence of PONV after anaesthesia, despite the advances in antiemetic therapy in the last decades is still found to be relatively high. Our study was aimed at comparing the antiemetic efficacy of Granisetron alone and the combined use of Granisetron and Dexamethasone in preventing PONV in laparoscopic cholecystectomy. In our study the factors that would have contributed to nausea and vomiting may be laparoscopic surgery, surgery for a gall bladder related pathology, use of Isoflurane, use of Fentanyl etc. In our study, the treatment groups were similar in terms of patient characteristics, surgical procedure, type of anaesthesia and analgesics used postoperatively. Therefore, the differences in scores can be attributed to the differences in the agents tested.

Hidenori et al did a comparative study between granisetron and droperidol for reducing the incidence and severity of PONV after laparoscopic cholecystectomy. 80 patients assigned to one of three treatment group: placebo (saline), 1.25 mg droperidol or 3mg granisetron Incidence of PONV was 46% with placebo, 41% with droperidol and 15% with granisetron ($p<0.05$). They concluded that granisetron is more effective than droperidol and placebo for reducing the incidence and severity of PONV. In our study complete response(no PONV) was 70% with group G and 96.7% with group G+D.

Wang JJ et al evaluated the antiemetic effect of iv dexamethasone compared with saline in the prevention of nausea and vomiting after laparoscopic cholecystectomy. They studied 90 patients requiring general anaesthesia for laparoscopic cholecystectomy, in a randomized, double blinded, placebo controlled study.They found out that 10% of patients in the dexamethasone group compared with 34% in the saline group reported vomiting ($p<0.05$). The total incidence of nausea and vomiting was 23% in the dexamethasone group and 63% in the saline group ($p<0.001$). They concluded that dexamethasone 8 mg significantly decreased the incidence of nausea and vomiting after laparoscopic cholecystectomy. In our study in group G+D 96.7% and in group G 70% complete response (no PONV) was seen i.e, dexamethasone shows even more better results when combined with granisetron.

Fujii and colleagues published nine articles comparing the combination of granisetron and dexamethasone with single agent

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prophylaxis in a randomized, double blind study in patients undergoing middle ear surgery, 120 patients received granisetron 3mg or dexamethasone 8mg plus granisetron 3mg, immediately before induction of anaesthesia.They concluded that the prophylactic use of combined granisetron and dexamethasone was more effective. In our study also the results show group G+D has less incidence of PONV than group G(monotherapy).

CONCLUSION

The incidence of PONV after laparoscopic cholecystectomy is large. In our study the combination (Granisetron plus Dexamethasone) was found to be better in attaining a complete response than Granisetron alone. Adverse effects and need for rescue antiemetic is less in Group G+D than G. We concluded that this combination might be considered clinically relevant in a high-risk setting.

References :

1. Wang JJ, Ho ST, Liu HS, Ho CM. Prophylactic antiemetic effect of Dexamethasone in women undergoing ambulatory laparoscopic surgery. Br J Anaesth 2000; 84: 459-462.
2. Nesek Adam, Grizelj-Stojcic, Rasic. Comparison of Dexamethasone, metoclopramide and their combination in prevention of PONV after laparoscopic cholecystectomy. Surgical Endoscopy 2007 April; 21: 607-612.
3. Yoshitaka Fujii, Hiroyoshi Tanaka, Tsuneo Kawasaki. Effects of granisetron in the treatment of nausea and vomiting after laparoscopic cholecystectomy: A dose-ranging study. Clin Therap 2004 Jul; 26 (7): 1055-1060.
4. Fujii Y, Tanaka H, Kawasaki T. Randomized clinical trial of granisetron, droperidol and metoclopramide for the treatment of nausea and vomiting after laparoscopic cholescytectomy. Br J Surg 2000; 87: 285-288