

ROLE OF METOCHLOPRAMIDE AND DIMENHYDRINATE IN PREVENTION OF POSTOPERATIVE NAUSEA AND VOMITING IN LAPAROSCOPIC GYNAECOLOGICAL SURGERY

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ABSTRACT

Objective: To evaluate the role of metoclopramide and dimenhydrinate in controlling postoperative nausea and vomiting (PONV) and its cost effectiveness in gynaecological laparoscopy.

Material and methods: This study was conducted in the department of anaesthesiology and intensive care unit, Pakistan Institute of Medical Sciences, Islamabad from June 2004 to March 2006. Ninety nine female patients belonging to American society of Anaesthesiologist (ASA) grading ASA-1 to ASA-III, scheduled for laparoscopic surgery, who did not fall in exclusion criteria were finally included. Anaesthetic technique was standardized for all patients. Injection Metoclopramide 10 mg and injection Dimenhydrinate 50 mg were administered 20 min before the procedure was over. At the end of procedure patients were transferred to the recovery room for observation for 10 hours. Four point verbal descriptive scale (VDS) was used to identify the presence and severity of PONV.

Results: Four out of 99 (4.04%) patients developed nausea soon after regaining consciousness and did not demand any medication for relief. Three (3.03%) patients developed vomiting. It was single episode and no rescue medication was needed. Most of the symptoms developed within 10 -30 minutes of reversal.

Conclusion: Metoclopramide and dimenhydrinate is a good combination to combat PONV and is cost-effective in laparoscopic gynaecological surgery.

Key Words: Laparoscopic gynaecologic surgery. PONV. Metoclopramide. Dimenhydrinate.

INTRODUCTION

Nausea and vomiting are non specific symptomatic responses to a variety of conditions and is a significant problem in laparoscopic surgery¹. Nausea occurs more frequently than overt vomiting and may be alleviated by act of emesis. postoperative nausea and vomiting (PONV) can result in dehydration, electrolyte imbalance, tension on suture lines, venous hypertension, and delay in discharge especially after day case surgery². Even pulmonary aspiration may result if airway reflexes are not properly returned or depressed due to narcotic analgesics. There is a high incidence of PONV in laparoscopic surgical procedures³.

As early as 1916, it had been suggested that the anaesthetic agent, type of surgery and opioids all influence PONV. Additional factors like

body habits, medical conditions, gender, age, pregnancy, phase of menstrual cycle, type of surgery, anaesthetic and analgesic medication and post operative hypotension all influence PONV⁴.

Various drugs are in practice, alone or in combination for prevention and treatment of PONV⁵. Individual drugs can reduce PONV to 50% but still a large population is exposed to the risk⁶. Metoclopramide, dimenhydrinate, dexamethasone, domperidone all are tried but with varying degree of success⁷. Ondansetron is an effective single drug regimen but costly and its use limited to resistant PONV and chemotherapy⁸.

Now a days multiple drug policy is used with combination like metoclopramide and tropeserone, droperidol and ondansetron and stated to be very successful but may be expensive⁶.

FREQUENCY OF POSTOPERATIVE NAUSEA AND VOMITING (PONV)

Ponv	Frequency (n=99)	%age
Nausea	4	4.04
Vomiting	3	3.03

Table 1

Present concerns are to adopt a regimen which is cost effective with minimal side effects. Prophylactic administration of metoclopramide significantly reduces the incidence of postoperative vomiting in laparoscopic surgery and is found to be more cost-effective treatment⁹.

Dimenhydrinate is a competitive antagonist at H 1 receptors with moderate potency. It is a powerful antiemetic but drowsiness is the most common side effect. Metoclopramide is a dopamine antagonist, gastrointestinal prokinetic resulting in accelerated clearance of liquids and solids and shortened transit time through small intestine. Sedation is a side effect of metoclopramide but only significant in the presence of other CNS depressants.

The purpose of this study was to asses PONV after a combination therapy of metoclopramide and dimenhydrinate in gynaecological laparoscopic surgery and its cost effectiveness.

MATERIAL AND METHODS

This study was conducted in the department of anaesthesiology and intensive care unit, Pakistan institute of medical sciences, Islamabad from June 2004 to March 2006. After approval from hospital ethical committee during eighteen months time period, 99 female patients belonging to American society of Anaesthesiologist (ASA) grading ASA-1 to ASA-111 were selected from out patient department scheduled for laparoscopic surgery. Patients with history of

motion sickness, hiatus hernia, morbid obesity, diabetes mellitus, ischemic heart disease, hepatorenal diseases, ear or throat disease and patients on anticancer chemotherapy were excluded from the study.

Each patient was allotted an official proforma which was filled regularly during surgery and postoperative period in addition to routine anaesthesia record. Anaesthetic technique was standardized with premedication with 7.5 mg midazolam night before surgery and early morning with sip of water.

Monitoring was started on the operation table including ECG, heart rate, O₂ saturation, non invasive blood pressure and end tidal carbon dioxide (ETCO₂). Standard anaesthetic technique was used to all patients including pethidine 1mg/kg, induction with thiopentone sodium in sleeping dose, intubation with atracurium 1mg/kg. Maintenance was with nitrous oxide and O₂ in 60:40 ratios, muscle relaxation with atracurium and ventilation was controlled with rate adjusted according to ETCO₂.

Injection metoclopramide 10mg and injection dimenhydrinate 50 mg were administered 20 min before the procedure was over. Twenty minutes time was calculated in collaboration with surgeon before removal of laparoscopic ports. Muscle relaxation was antagonised with neostigmine 0.05mg/kg and atropine 0.02mg/kg. At the end of procedure patient were transferred to the recovery room for observation for 10 hours. Four point verbal descriptive scale (VDS) was used to identify the presence and severity of PONV. During this time frequent visit were made to recovery for observation.

RESULTS

The age ranged between 16 and 40 years. Four out of 99 patients developed nausea soon after regaining consciousness and did not demand any medication for relief. Three patients developed

INDICATIONS FOR LAPAROSCOPY AND INCIDENCE OF PONV

Indication	No. of patients (n=99)	Nausea (n=4)	Vomiting (n=3)
Primary infertility	44 (44.44%)	02	
Secondary infertility	28 (28.28%)	01	01
Ectopic pregnancy	07 (7.07%)		
Tubal ligation	06 (6.06%)		
PID	05(5.05%)	01	01
Ovarian cyst	06(6.06%)		
Endometriosis	03 (3.03%)		01

Table 2

vomiting (Table 1). It was single episode and no rescue medication was needed. Most of the symptoms developed within 10-30 minutes of reversal.

The indications for laparoscopy included, primary infertility in 44, secondary infertility in 28, ectopic pregnancy in 7, tubal ligation in 6, PID in 5, ovarian cyst in 6, endometriosis in 3. (Table 2)

Among 4 patients developing nausea, 2 had infertility, 1 had PID and 1 had frozen pelvis due to tuberculosis. Among 3 developing vomiting 1 patient had PID, 1 had endometriosis and 1 had secondary infertility.

DISCUSSION

Postoperative nausea and vomiting following anaesthesia and laparoscopic surgery are common and can create considerable problems regarding management of patients and outcome of the surgical procedure⁹. The group selected for the study is the one with high susceptibility to PONV that is female gender, laparoscopic surgery, young age and presence of anxiety disorders. St. Pierre et al¹⁰ also mentioned the same observation. Ahmed et al¹¹ have reported an incidence of more than 50% in gynaecological laparoscopy.

Despite numerous guidelines, PONV is still the most common reason for poor patient satisfaction in the postoperative period. It can be due to lack of understanding of the mechanisms involved, difficulties in estimating the risk in individual patients, lack of a gold standard anti-emetic intervention, and variability of dose-response relationships for current interventions¹². There is an inclination to provide high risk patients for PONV with anti-emetic prophylaxis as treatment of established PONV has been demonstrated as inferior to prophylaxis¹³.

In our study, the overall incidence of PONV was 7%, while in the study of M Jamil et al¹⁴, it was 19%. McKenzie et al¹⁵ compared ondansetron and placebo in woman undergoing laparoscopic gynecological surgery under local and general anesthesia. They reported vomiting in 54% patients in placebo group which is much higher than ondansetron group.

Papadimitriou et al¹⁶ used tropeserone and metoclopramide in combination and tropeserone alone and compared the results in laparoscopic gynaecological surgery. The incidence of PONV was 13% and 37% respectively thus concluding that combination therapy was superior as the two drugs have different sites of action.

Wang JJ et al¹⁷ studied dexamethasone in

the females undergoing day case laparoscopy for tubal ligation and observed 27% incidence, thus reaching to conclusion of relative inefficacy of single drug. Chuu CC et al¹⁸ studied the prophylactic effect of haloperidol plus dexamethasone on PONV in patients undergoing laparoscopically assisted vaginal hysterectomy and concluded that combination of prophylactic haloperidol plus dexamethasone produced a greater reduction in the incidence of PONV than did either drug used alone, placebo or droperidol without increasing perioperative adverse outcomes. Rusch D et al¹⁹ observed that monoprophyllaxis with droperidol or metoclopramide failed to attain a satisfying PONV-prophylaxis in patients at high risk for PONV and antiemetic combination might be an effective and safe solution. These results support our conclusion that combination therapy is effective in prevention of PONV.

Although 5-HT₃ antagonists are an attractive single drug regimen but their cost makes their use very limited in developing countries. Even in developed countries trend is towards cost effective prophylaxis as supported by Sheila M et al²⁰.

Hill RP et al²¹ stressed the need for cost analysis in the era of growing economic restraints, recommending use of antiemetics in only high risk group and cheaper regimens. We also selected the combination which is quite cheap, easily available and effective, as we observed an overall incidence of 3.9% for nausea, 2.9% for vomiting and low overall incidence of PONV i.e 7%.

One side effect was sedation in the group which could be due to dimenhydrinate. This may be a concern in day case surgery but not in our study as all of the patients were admitted overnight and the author found it beneficial as majority of patients with infertility were anxious.

CONCLUSION

Metoclopramide and dimenhydrinate is a good combination to combat PONV, as the combination is cost-effective, easily available and making majority of group symptom free. We recommend this regimen for surgeries in which patient is planned for overnight stay in the hospital and not for day case surgery.

REFERENCES

1. Wilson EB, Bass CS, Abrameit W, Roberson R, Smith RW. Metoclopramide versus ondansetron in prophylaxis of nausea and vomiting for laparoscopic cholecystectomy. *Am J Surg* 2001; 181:138-41.
2. Ashfaq M. Prevention of postoperative nausea

- and vomiting: A review of causative factors and management. *J Anaesth* 1994; 9:74-88.
3. Oksuz H, Zencirci B, Ezberci M. Comparison of the effectiveness of metoclopramide, ondansetron, and granisetron on the prevention of nausea and vomiting after laparoscopic cholecystectomy. *J Laparoendosc Adv Surg Tech A*. 2007; 17:803-8.
 4. Gan TJ. Risk factors for postoperative nausea and vomiting. *Anesth Analg* 2006; 102: 1884-98.
 5. Khan FA, Ul-Haq A. Effect of cricoid pressure on the incidence of nausea and vomiting in the immediate postoperative period. *Anaesthesia* 2000; 55:163-6.
 6. Muhammad SR, Abbas SZ, Abbas SQ. Comparison of tropeserone with metoclopramide and placebo in controlling PONV in patients undergoing mini laparotomy cholecystectomy. *J Pak Med Assoc* 2000; 50:386-8.
 7. Henzi I, Walder B, Trammer MR. Metoclopramide in the prevention of postoperative nausea and vomiting. *Br J Anaesth* 1999; 83:761-71.
 8. Dempey CL, Coop AJ, Shillington A, Farley PA, Eberhardt DR, O'Briant S. Antiemetic effectiveness of ondansetron and granisetron in patients with breast cancer treated with cyclophosphamide. *Am J Health-Syst Pharm* 2004; 61:781-6.
 9. Wilson EB, Bass CS, Abrameit W, Roberson R, Smith RW. Metoclopramide versus ondansetron in prophylaxis of nausea and vomiting for laparoscopic cholecystectomy. *Am J Surg*. 2001; 181:138-41.
 10. St Pierre, Frighetto L, Marra CA. Influence of standardized orders on postoperative nausea and vomiting after gynaecological surgery. *Ann Pharmacother* 2002; 36:210-7.
 11. Ahmed A B, Hobbs G J, Curran JP. Randomized placebo controlled trial of combination antiemetic prophylaxis for day case gynaecological laparoscopic surgery. *Br J Anaesth* 2000; 85:678-82.
 12. Gan TJ, Meyer T, Apfel CC, Chung F, Davis PJ, Eubanks S, et al. Consensus guidelines for managing postoperative nausea and vomiting. *Anesth Analg* 2003; 97: 62-71.
 13. Apfel CC, Kranke P, Katz MH, Goepfert C, Papenfuss T, Rauch S, et al. Volatile anesthetics may be the main cause of early but not delayed postoperative vomiting: a randomized controlled trial of factorial design. *Br J Anaesth* 2002; 88: 659-68.
 14. Jamil M, Gilani SM, Khan SA. Comparison of metoclopramide, prochlorperazine and placebo in prevention of postoperative nausea and vomiting (PONV) following tonsillectomy in young adults. *J Ayub Med coll Abbotabd* 2005; 17:40-4.
 15. Mckenzie R, Kovac A, Connor TO. Comparison of ondansetron versus placebo to prevent postoperative nausea and vomiting in woman undergoing ambulatory gynecologic surgery. *Anesthesiology* 1993; 78:21-8.
 16. Papadimitriou L, Livanios S, Katsaros G, Hassiakos D, Koussi T, Demesticha T. Prevention of postoperative nausea and vomiting after laparoscopic gynaecological surgery: Combined antiemetic treatment with tropeserone and metoclopramide vs metoclopramide alone. *Eur J Anaesthesiol* 2001; 18:615-9.
 17. Wang JJ, Ho ST, Ho CM. Prophylactic antiemetic effect of dexamethasone in women undergoing ambulatory laparoscopic surgery. *Br J Anaesth* 2000; 84:459-62.
 18. Chu CC, Shieh JP, Tzeng JI, Chen JY, Lee Y, Ho ST, et al. The prophylactic effect of haloperidol plus dexamethasone on postoperative nausea and vomiting in patients undergoing laparoscopically assisted vaginal hysterectomy. *Anesth Analg* 2008;106:1402-6.
 19. Rüsç D, Palm S, Sauerwald M, Römer T, Wulf H. Prophylaxis of postoperative nausea and vomiting following gynecological laparoscopy. *Anesthesiol Intensivmed Notfallmed Schmerzther*. 2002; 37:16-23.
 20. Wilhelm SM, Michelle L, Dehoorne-Smith, Pramodini B, Kale-Pradhan. Prevention of postoperative nausea and vomiting. *Ann Pharmacother* 2007; 41:68-78.
 21. Hill RP, Lubarsky DA, Phillips Blute B, Forteny JT, Creed MR, Glass PS, et al. Cost effectiveness of prophylactic antiemetic therapy with ondansetron, droperidol or placebo. *Anesthesiology* 2000; 92:958-67.

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