EVALUATION OF TWO ANTIEMETIC AGENTS DURING OUTPATIENT GYNAECOLOGICAL SURGERY

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ABSTRACT

Thirty-two adult female ASA I patients (American Society of Anesthesiologists' grading) undergoing voluntary termination of pregnancy (VTP) under general anaesthesia were randomly divided into three groups. Patients received 0.6 mg/kg pentazocine intravenously five minutes prior to induction of anaesthesia along with either isotonic saline, or promethazine 0.5 mg/kg or metoclopramide 0.2 mg/kg. Anaesthesia was induced with intravenous thiopentone and maintained with nitrous oxide in oxygen and boluses of thiopentone. Vomiting and sedation were scored at the end of anaesthesia, one hour later and at the time of discharge. The mean vomiting score was comparable in the three groups. Though the mean dose of thiopentone used was significantly less in the promethazine group, the sedation scores and the duration of stay in the clinic were comparable in all the groups. It is concluded that promethazine and metoclopramide in the doses used are ineffective as antiemetic agents in outpatient gynaecological patients.

Keywords: *vomiting, postoperative, drugs, antiemetic*

SINGAPORE MED J 1994; Vol 35: 271-273

INTRODUCTION

Outpatient surgical procedures are resource-efficient[1] and cause minimum disruption of the patient's social life. Thus many gynaecological procedures including voluntary termination of pregnancy (VTP) during the first trimester of pregnancy, are often performed on an outpatient basis. Postoperative nausea and vomiting are common after gynaecological procedures[2,3]. These can delay the patient's discharge from the hospital[4], negating the chief advantage of outpatient surgery. Vomiting also increases the risk of pulmonary aspiration in sedated patients[5]. Because of these reasons antiemetics are frequently used prophylactically in gynaecological outpatient surgery[6]. The present study was undertaken to evaluate the efficacy of the commonly used antiemetic agents, metoclopramide and promethazine, during VTP, and to compare the side effects produced by them.

METHODS

Thirty-two female ASA grade I patients undergoing VTP during the first trimester of pregnancy under general anaesthesia were studied after obtaining informed consent. The patients were divided randomly into three groups. Five minutes before the induction of anaesthesia the patients were administered iv pentazocine 0.6 mg/kg along with isotonic saline 1 ml (Control group) or promethazine 0.5 mg/kg or metoclopramide 0.2 mg/kg. Anaesthesia was induced with a sleep dose of thiopentone sodium and maintained with 66% nitrous oxide in oxygen through a face mask and Magill circuit and intravenous boluses of thiopentone. The VTP was performed by dilatation of the cervix and vacuum aspiration. Oxytocin 10 IU and methylergometrine 0.2 mg were given intravenously as required. Patients were transferred to the recovery room where they were observed till discharge. The degree of vomiting and sedation were assessed at the end of anaesthesia (t_1), one hour later (t_2) and at the time of discharge (t_3) using the scoring system given (Table I). Side effects produced by the antiemetic drugs were recorded.

Table I – Scoring system for nausea and vomiting

Score	Vomiting	Sedation
4	No nausea or vomiting	Awake and talking
3	Nausea but no vomiting	Responding to commands
2	One vomiting and retching	Responding to physical stimulus
1	Vomiting more than once, requiring treatment	Deeply asleep and not responsive

The demographic data, the dose of thiopentone, the duration of the procedure and of stay in the hospital were analysed using ANOVA. The period of gestation (POG) and the vomiting and sedation scores were analysed using Kruskal-Wallis test. Chi-square test was used to analyse the incidence of patients with no nausea or vomiting (vomiting score 4) throughout the period of study, of patients with concurrently low sedation and vomiting scores and of those receiving oxytocins. A 'p' value of less than 0.05 was considered statistically significant.

OBSERVATION AND RESULTS

A total of 32 patients were studied. The metoclopramide group consisted of 10 patients while the control and promethazine groups comprised of 11 patients each.

Patients in the three groups were comparable with regard to age, body weight, POG and duration of procedure. The number of patients who received oxytocins was not significantly different among the three groups (Table II).

Six patients in the control group, ten in the promethazine group and seven in the metoclopramide group had a vomiting score of 4 throughout the period of study. These figures were statistically comparable. Vomiting and sedation scores are given in Table III. All patients had a vomiting score of 4 at t_1. The average vomiting scores at t_2 and t_3 were comparable in the three groups. The number of patients with vomiting score of 2 or less was similar in the three groups (Table IV).

The average sedation scores were not significantly different

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in the three groups at any time. At t_3 all the patients were completely awake and talking (ie sedation score 4). The number of patients with a sedation score of 2 or less was similar in the three groups (Table IV). No side effects other than sedation were observed in any patient.

The average amount of thiopentone used in the promethazine group was significantly lesser than that in the control group while there was no difference between the control and metoclopramide groups. The mean duration of stay of patients after anaesthesia was similar among three groups (Table II).

Table II – Observations in the three groups [mean (SD)]

	Control group (n=11)	Promethazine group (n=11)	Metoclopramide group (n=10)
Age (years)	25.00 (4.88)	24.36 (4.60)	22.40 (2.50)
Weight (kg)	47.91 (6.39)	49.82 (5.04)	49.10 (6.02)
Duration of procedure (minutes)	8.82 (2.12)	7.18 (2.04)	9.40 (4.45)
Duration of stay (minutes)	149.55 (42.40)	161.36 (35.81)	153.50 (42.25)
Thiopentone dose (mg/kg)	8.06 (1.98)	6.05* (1.56)	7.59 (1.07)
Number of patients receiving oxytocins	6	2	4

* $p<0.05$ promethazine group vs control group

Table III – Vomiting and sedation scores in the three groups [mean (SD)]

	Control group (n=11)	Promethazine group (n=11)	Metoclopramide group (n=10)
Vomiting Score at			
t_1	4.00 (0.00)	4.00 (0.00)	4.00 (0.00)
t_2	3.82 (0.57)	4.00 (0.00)	3.60 (0.80)
t_3	3.36 (0.77)	3.82 (0.57)	3.40 (1.20)
Sedation Score at			
t_1	2.27 (0.75)	2.55 (0.50)	2.10 (0.54)
t_2	3.82 (0.39)	3.45 (0.50)	3.90 (0.30)
t_3	4.00 (0.00)	4.00 (0.00)	4.00 (0.00)

Table IV – Number of patients with vomiting and sedation scores of 2 or less

	Control group (n=11)	Promethazine group (n=11)	Metoclopramide group (n=10)
Vomiting score of 2 or less	3	1	4
Sedation score of 2 or less	6	5	8

DISCUSSION

The reported incidence of postoperative vomiting following VTP under general anaesthesia varies from 25% to 47%[2,7,8]. We found an overall incidence of vomiting of 35.56%. Various factors contribute to the high incidence of nausea and vomiting after abortion. These include early pregnancy, female gender, excessive anxiety, pain, drugs (opiates, oxytocins), ambulation and dilation of cervix[3,9]. In the present study, all patients received the same amount of opiate. The number of patients receiving oxytocins was similar in the three groups.

The vomiting centre in the brain is stimulated by various afferent impulses reaching either directly or indirectly via the chemoreceptor trigger zone (CTZ). Autonomic afferents from the gastrointestinal tract, the vestibular component of the eighth cranial nerve, visual and cortical input, painful stimuli and anaesthetic drugs affects the vomiting centre directly. CTZ is stimulated by opiates, anaesthetic agents, etc[3]. Antiemetic agents act at one or more of these sites.

In spite of its known emetic properties, we used pentazocine in all our patients for intraoperative analgesia. Since it was used in three groups of patients, it should not affect the validity of the study.

Metoclopramide is a substituted benzamide which blocks the dopamine receptors in the CTZ centrally and is cholinergic peripherally causing gastrokinesis and reducing gastric volume[10]. There is contradictory evidence regarding its efficacy. Cohen et al[7] and Morrison et al[8] had observed that 10-20 mg of intravenous metoclopramide is ineffective in preventing postoperative nausea and vomiting in minor gynaecological surgery. Others have however found that metoclopramide in the dose of 10 mg decreases the incidence of postoperative nausea and vomiting in outpatient gynaecological surgery[11,12].

Metoclopramide was not effective as an antiemetic in this study. Though the usual dose for metoclopramide as an antiemetic is 0.15-0.2 mg/kg[13], a much higher dose (up to 2 mg/kg) has been used successfully to reduce chemotherapy-induced vomiting with minimal side effects[14]. This could be a reason for the inefficacy of metoclopramide in the study. Another reason could be the multifactorial aetiology of postoperative nausea and vomiting and inability of metoclopramide alone to block all the afferent pathways which cause emesis. This view is supported by the observation that a combination of metoclopramide and droperidol is more efficacious than either drug alone[4].

Promethazine has been used for antiemetic prophylaxis, mostly in conjunction with narcotics and found to be useful in preventing postoperative nausea and vomiting[3,15,16]. Promethazine is a phenothiazine and H_1 receptor blocker[17]. It does not however block the afferent impulses to CTZ, which may be the cause of its inefficacy in the present study.

The dose of thiopentone used was less in the promethazine group. The sedation scores however were similar in the three groups. This may indicate that promethazine decreases the requirement of thiopentone without altering the overall sedation.

The prerequisites for pulmonary aspiration have been described to be a sedated patient with obtunded reflexes and occurrence of vomiting[5]. None of our patients had a sedation and a vomiting score of less than 2 concurrently and thus were not at risk of pulmonary aspiration.

Extrapyramidal side effects are known to occur with the use of metoclopramide but are transient, mild and infrequent[18]. Promethazine may cause dystonia in addition to sedation[17]. The only side effect observed was sedation in the promethazine group.

In conclusion metoclopramide in the dose of 0.2 mg/kg and promethazine in the dose of 0.5 mg/kg are ineffective for antiemetic prophylaxis in outpatients undergoing first trimester VTP under

general anesthesia. Promethazine in the dose used decreases the amount of thiopentone required for induction of general anaesthesia. A study using a higher dose of metoclopramide and a combination of antiemetic drugs acting at different sites is indicated.

References

1. Kitz DS, Lecky JH, Sluzarz-Ladden C, Conahan TJ. Inpatient versus day surgery: Differences in resource use, patient volume and anesthesia reimbursement. Anesth Analg 1987; 66: S97.
2. Bone ME, Dowson S, Smith G. A comparison of nalbuphine with fentanyl for postoperative pain relief following termination of pregnancy under day care anaesthesia. Anaesthesia 1988; 43: 194-7.
3. White PF, Shafer A. Nausea and vomiting: Causes and prophylaxis. Semin Anesth 1987; 6: 300-8.
4. Doze VA, Shafer A, White PF. Nausea and vomiting after outpatient anesthesia – Effectiveness of droperidol alone and in combination with metoclopramide. Anesth Analg 1987; 66: S41.
5. Gibbs CP, Modell JH. Management of aspiration pneumonitis. In: Miller RD. ed. Anesthesia. 3rd ed. New York: Churchill Livingstone, 1990: 1295-7.
6. Cole AGH. Anaesthesia for gynaecological, genitourinary and orthopaedic surgery. In: Aitkenhead AR, Smith G. eds. Textbook of Anaesthesia. 2nd ed. London: Churchill Livingstone, 1991: 486-7.
7. Cohen SE, Woods WA, Wyner J. Antiemetic efficacy of droperidol and metoclopramide. Anesthesiology 1984; 60: 67-9.
8. Morrison JD, Hill GB, Dundee JW. Studies of drugs given before anaesthesia. XV: Evaluation of the method of study after 10,000 observations. Br J Anaesth 1968; 40: 890-900.
9. Dundee JW, Clarke RSJ. The premedicant and antiemetic action of metoclopramide. Postgrad Med J 1973; 49 (suppl 4): 34-7.
10. Taylor P. Cholinergic agents. In: Gilman AG, Goodman LS, Rall TW, Murad F. eds. The Pharmacological Basis of Therapeutics. 7th ed. New York: Macmillan Publishing Company, 1985: 105-9.
11. Miller CD, Anderson WG. Silent regurgitation and day case gynaecological patients. Anaesthesia 1988; 43: 321-3.
12. Madej TH, Simpson KH. Comparison of the use of domperidone, droperidol and metoclopramide in the prevention of nausea and vomiting following gynaecological surgery in day cases. Br J Anaesth 1986; 58: 879-83.
13. Baily PL, Stanley TH. Narcotic intravenous anesthetics. In: Miller RD. ed. Anesthesia. 3rd ed. New York: Churchill Livingstone, 1990: 316-7.
14. Gralla RJ, Itri LM, Pisko SE, Squillante AE, Kelson DP, Braun DW, et al. Antiemetic efficacy of high dose metoclopramide: Randomized trials with placebo and prochlorperazine in patients with chemotherapy induced nausea and vomiting. N Engl J Med 1991; 305: 905-9.
15. Rutter TW, Cowan D. Morphine requirements for post-operative pain relief using patient controlled analgesia: Comparison of morphine alone and in combination with promethazine. Anesth Analg 1990; 70: S341.
16. Sung YF, Tillette T. Placebo, ephedrine and antiemetics in postoperative nausea and vomiting in ambulatory surgery patients. Anesth Analg 1991; 72: S285.
17. Baldessarine RJ. Drugs used in the treatment of psychiatric disorders. In: Gilman AG, Goodman LS, Rall TW, Murad F. eds. The Pharmacological Basis of Therapeutics. 7th ed. New York: Macmillan Publishing Company, 1985: 411-2.
18. Abibi R, McCallum RW. Metoclopramide: Pharmacology and clinical application. Ann Intern Med 1983; 98: 86-95.