

Efficacy of Promethazine Suppositories Dispensed to Outpatient Surgical Patients

Cara Dalton Wright, Judy Jilka and W. Brooks Gentry

*Department of Anesthesiology, University of Arkansas for Medical Sciences,
Little Rock, Arkansas*

(Received September 30, 1998; accepted January 2, 1999)

Postoperative nausea and vomiting frequently complicate outpatient anesthesia and surgery. The duration of treatment for this complication must occasionally extend beyond discharge from the hospital. In this study, we evaluated the commonly used anti-emetic promethazine for its efficacy in the post-discharge period.

Adult outpatient surgical patients who had excessive postoperative nausea and vomiting in the recovery room, or who were at risk for postoperative nausea and vomiting following discharge were given two promethazine suppositories (25 mg) for home use. All patients were contacted by our recovery room nurses on the first business day after their surgery and questioned as to their use of the suppositories and, if used, their efficacy.

We found that 55 percent of patients given promethazine suppositories for home use had nausea and vomiting in the post-discharge period. Of the patients given promethazine, 89 percent used the suppositories. All of these patients reported improvement in their symptoms following use of the suppositories. None reported adverse effects from the promethazine suppositories.

In conclusion, we found promethazine suppositories to be an inexpensive and efficacious treatment for nausea and vomiting in adult outpatient surgical patients following discharge from the hospital. Side-effects were minimal, and our patients voiced no complaints about this mode of therapy. We recommend this therapy for treatment of nausea and vomiting after hospital discharge following adult outpatient surgery.

INTRODUCTION

Postoperative nausea and vomiting (PONV)^b are among the most common complications following outpatient anesthesia and surgery. They seldom result in admission to the hospital, but they frequently delay discharge from the recovery room [1, 2]. The etiology of PONV is multifactorial, and no single anesthetic technique changes its incidence substantially [2]. While PONV occurs most frequently in the immediate postoperative period, many patients develop PONV in the post-anesthetic care unit (PACU) after removal of their intravenous (IV) line, on their way home or at home many hours post-operatively [3]. PONV that persists beyond discharge from the PACU occurs more frequently in patients

^a*To whom all correspondence should be addressed:* W. Brooks Gentry, M.D., University of Arkansas for Medical Sciences, Department of Anesthesiology, 4301 W. Markham, Slot 515, Little Rock, AR 72205. Tel.: 501-686-7611; Fax: 501-603-1951; E-mail: gentry-williams@exchange.uams.edu.

^b*Abbreviations:* PONV, postoperative nausea and vomiting; IV, intravenous; PACU, post-anesthetic care unit; UAMS ODS, University of Arkansas for Medical Sciences One-Day Surgery Center; ASA PS, American Society of Anesthesiologists Physical Status; MAC, monitored anesthesia care; 5-HT₃, serotonin; H₁ or H₂, histamine 1 or 2 receptors; D₂, dopamine; I.M., intramuscular.

who have had multiple episodes of emesis in the PACU and in patients who have a history of motion sickness. In addition, many patients with no history of motion sickness develop nausea during their drive home, especially if they had middle ear surgery, pelvic laparoscopy, inguinal herniorrhaphy or strabismus surgery [4, 5]. Finally, nausea and vomiting that occur at home negatively impact the outpatient surgery experience of patients [6]. Treatment of PONV must, therefore, frequently extend beyond the PACU stay of our patients.

Promethazine suppositories (Phenergan, Wyeth Laboratories, Philadelphia, PA; 25 mg in adults) are used frequently to treat PONV after patients are discharged from the PACU [2]. Avoiding the oral route of administration decreases the possibility that emesis will curtail its effectiveness, and the rectal route avoids the necessity of an IV line. In addition, promethazine suppositories have a long record of safe and effective use in the treatment of PONV [7]. One or two promethazine suppositories are frequently prescribed for outpatients by their surgeon or by the discharging anesthesiologist at our institution to take home because PONV is usually short-lived, and this prescription usually treats PONV effectively. We had not, however, evaluated the efficacy of this practice systematically. Therefore, the first purpose of our study was to determine the frequency of promethazine suppository prescription to outpatients discharged from the University of Arkansas for Medical Sciences One-Day Surgery Center (UAMS ODS). We then wanted to assess the usage of promethazine dispensed to outpatients in the UAMS ODS PACU. Finally, we wanted to evaluate the efficacy of promethazine suppositories in ameliorating nausea and vomiting in adult outpatients following their discharge from the hospital.

METHODS

All of this study was performed and all data were collected following approval of the UAMS Human Research Advisory Committee. This study was an extension of a continuous quality control protocol initiated in our PACU. Any patient who had outpatient surgery in the 1997 calendar year and was given promethazine suppositories in the recovery room to take home was enrolled retrospectively in this quality control study. We identified our patients by medical record number only to avoid using the same patient twice.

Specific criteria for promethazine prescription varied with each surgeon or anesthesiologist; however, patients who developed PONV after removal of their intravenous line, or had a prolonged PACU stay due to PONV, or who had to take a long car trip to get home were given two promethazine suppositories (25 mg each) to take home along with instructions for their use. The nature and potential for side-effects were also discussed with the patients. In addition, patients for whom their surgeons had written prophylactic promethazine prescriptions were also included in the study group. Patient demographics (age, sex and weight), American Society of Anesthesiologists Physical Status (ASA PS), anesthetic regimens (general, monitored anesthesia care (MAC) or spinal) and the use of any perioperative antiemetics were recorded on the day of surgery prior to discharge from the PACU. Drugs that were classified as antiemetics included any agent that has been reported to block serotonin (5-HT₃), histamine (H₁ or H₂), muscarinic, or dopamine (D₂) receptors in the chemoreceptor trigger zone [3]. Drugs that were included were atropine, ondansetron, nizatidine, ranitidine, famotidine, metoclopramide, promethazine or droperidol, and could have been administered from the time of admission to ODS to the time of PACU discharge.

Standard follow-up for every patient who undergoes outpatient surgery in the ODS center is a telephone call on the next business day by a nurse in the ODS PACU to evaluate the patient for postoperative complications. On the day after surgery, the incidence of

PONV in the time from PACU discharge until the time of the phone call, and the use and efficacy of the promethazine treatment were recorded. To measure efficacy, the patients were given a choice of the following responses to the promethazine treatment: no improvement with suppository use, some improvement with suppository use, great improvement with suppository use or worsening of symptoms with promethazine use.

We reviewed retrospectively the medical records of the patients for whom data was collected during the quality control study for accuracy of the data collection. Specifically, we reviewed the anesthesia patient preoperative evaluation, the anesthetic record and the recovery room record to obtain this information. Patients who were nauseated after discharge were compared with those who were not using chi-square contingency tables for differences in sex, ASA PS, anesthetic regimens, perioperative use of narcotics and perioperative use of antiemetics. Results are reported as mean \pm SD.

RESULTS

A total of 108 patients were discharged from the UAMS ODS with promethazine suppositories in 1997. The medical records of nine of these were either unavailable or incomplete, and were excluded from the analysis. Demographic makeup and the surgical procedures represented are shown in Tables 1 and 2, respectively.

The study group included 80 general anesthetics, 18 MAC anesthetics, and one spinal anesthetic (Figure 1). In the study group, 54 of the 99 (55 percent) patients experienced nausea after discharge. Of these 54 patients, 48 used the suppository (89 percent). Fifteen of the nauseated patients in our study group had emesis, and of these, 10 used the suppository. All of the 48 patients who used the suppository reported improvement of symptoms. Four of the 48 patients (eight percent) reported some improvement, and 44 patients (92 percent) reported great improvement.

When assessing the patients who were nauseated after discharge vs. those who were not, there were no differences in the proportions of ASA PS 1 to ASA PS 2 patients, in the proportions of males to females, in narcotic use or in the anesthetic type used in the two groups. The use of antiemetics in the perioperative period in both groups was compared, and we found that, of the patients who experienced nausea after discharge, 45 of 54 had received an antiemetic in their perioperative course. Of the patients who did not experience nausea after discharge, 38 of 45 had received an antiemetic. These proportions were not significantly different.

Table 1: Demographic makeup of the study groups. Number of male and female patients are shown, along with the number of patients in each ASA PS class.

Age (yrs):	47.3 \pm 17.8
Sex (M/F)	39/60
ASA PS (1/2/3)	34/58/7

Table 2: Breakdown of the surgical procedures represented in the study group. Number of patients undergoing each type of surgery is shown.

Bone marrow harvest	4	Orthopedic	29
Nose and throat	9	Otology	35
General surgery	1	Plastic surgery	9
Gynecology	1	Urology	4
Ophthalmology	3		

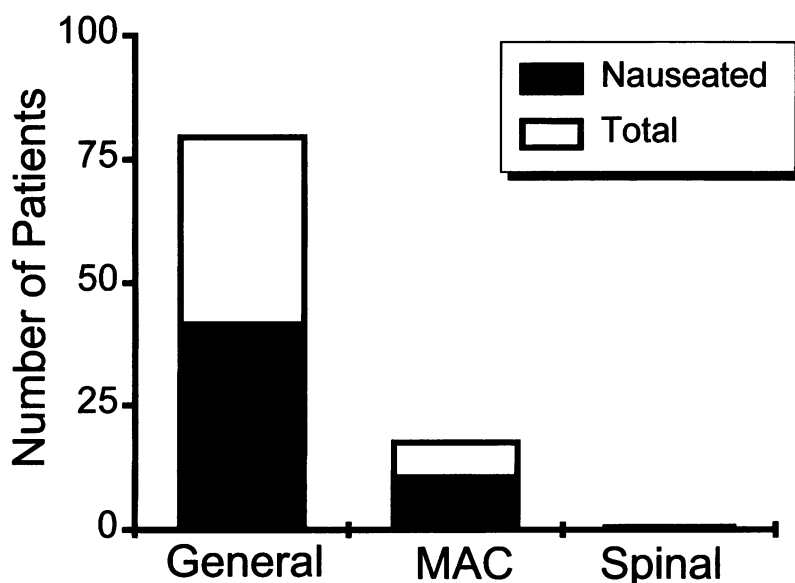


Figure 1. Numbers of patients undergoing each type of anesthesia (general, spinal, or monitored anesthesia care (MAC)) in the study group. The number of patients in each type of anesthetic who were nauseated after discharge is shown in the black portion of each column. The proportion of nauseated patients who underwent general anesthesia was not different from that undergoing MAC anesthesia.

DISCUSSION

According to UAMS records (Division of Surgical Services, University of Arkansas for Medical Sciences), 2719 patients had outpatient surgery at our ODS center in 1997. The frequency of promethazine suppository prescriptions written to the outpatients in our hospital in 1997 was, therefore, 108/2719, or about 4 percent. If we assume that our overall incidence of PONV after discharge is not different from the observations of other authors (about 7 percent [1]), we identified and treated over half of our patients who suffered PONV after discharge from the hospital.

In this study, we found that promethazine suppositories are effective in treating PONV at home following outpatient surgery, and that a high percentage of patients who suffered PONV used the promethazine suppositories. The nausea of all of the patients who took the suppositories improved. While promethazine and other phenothiazines have a long history of successful use as antiemetics [8], and their effects on the chemoreceptor trigger zone are well documented [9], other reasons for improvement must be considered. A placebo effect could have contributed to the improvement. Also, because nausea and vomiting after surgery tend to be short-lived, they are most likely to attenuate and abate shortly after completion of the procedure. Finally, the administration of antiemetics in the perioperative period could have improved the condition of these patients. Comparison of our study group to a placebo group could help answer these questions, but this was not done in this study because of ethical considerations.

Promethazine suppositories were well-tolerated in our patients, with no reports of adverse effects. Excess sedation, which is a well-known side effect of the phenothiazines [10] in particular, was not reported as a problem. Other potential neurologic side-effects include acute dystonia, akathisia, Parkinsonism, neuroleptic malignant syndrome, perioral

tremor and tardive dyskinesia, but long-term exposure is usually necessary for development of most of these complications [9]. Anticholinergic effects are also reported as frequent problems after promethazine use [9]. However, the anticholinergic effects of promethazine may be beneficial in patients who must travel great distances after surgery because this action contributes to its effectiveness as an antimotion sickness drug [11]. Our patients noted neither neurologic nor anticholinergic effects.

Another advantage of promethazine is that it is a cost-effective measure for treatment of PONV. The outpatient patient charge at our hospital pharmacy is \$1.85 per 25 mg suppository (University of Arkansas for Medical Sciences, Inpatient Satellite Pharmacy). We compared this to an intramuscular (IM) injection of ephedrine (25 mg)/hydroxyzine (25 mg). This is another treatment that has been commonly used in our patients who have PONV after removal of their IV line. The patient cost of one administration of IM ephedrine/hydroxyzine is \$22.35 (University of Arkansas for Medical Sciences Inpatient Satellite Pharmacy). The patient charge for one dose of ondansetron (4 mg) IV is \$111.05 (University of Arkansas for Medical Sciences, Inpatient Satellite Pharmacy). One hour of outpatient recovery time in our hospital costs \$476.40 (Division of Surgical Services, University of Arkansas for Medical Sciences). Therefore we consider promethazine suppositories a very cost-effective way to treat patients with PONV.

In conclusion, we have identified promethazine suppositories as a safe and effective regimen for treatment of PONV following discharge of our adult outpatients. Over half of our outpatients likely to experience PONV after discharge were given the prescription. Nearly 90 percent of the patients who had PONV after discharge used the prescription, with marked improvement of symptoms. In addition, this use of promethazine suppositories appears to be safe, as there were no reported side-effects. Finally, promethazine suppositories are a cost-effective treatment in our hospital.

Acknowledgements: The authors are grateful to Maria Castro, Ph.D., for her help with analysis and critical review of this paper, and to the PACU nurses at the UAMS ODS for their help with the data collection.

REFERENCES

1. Freeley, T.W. Postanesthesia care of the outpatient. *Int. Anesthesiol. Clinics* 32:127-144, 1994.
2. White, P.F. and Smith, I. Ambulatory anesthesia: past, present, and future. *Int. Anesthesiol. Clinics* 32: 1-16, 1994.
3. Watcha, M.F. and White, P.F. Postoperative nausea and vomiting: Its etiology, treatment, and prevention. *Anesthesiology* 77:162-184, 1992.
4. White, P.F. and Shafer, A. Nausea and vomiting: Causes and prophylaxis. *Semin. Anesth.* 3:300-308, 1987.
5. Kenny, G.N. Risk factors for postoperative nausea and vomiting. *Anaesthesia* 49(suppl): 6-10, 1994.
6. Hirsch, J. Impact of postoperative nausea and vomiting in the surgical setting. *Anaesthesia* 49(suppl):30-33, 1994.
7. Bakowski, M.T. Advances in anti-emetic therapy. *Cancer Treatment Rev.* 11:237-256, 1984.
8. Knapp, M.R. and Beecher, H.K. Postanesthetic nausea, vomiting and retching: evaluation of the antiemetic drugs dimenhydrinate (Dramamine), chlorpromazine and pentobarbital sodium. *J. Am. Med. Assn.* 160:376-385, 1956.
9. Baldessarini, R.J. Drugs and the treatment of psychiatric disorders: psychosis and anxiety. In: Hardman J.G. and Limbird L.E., eds. *The Pharmacological Basis of Therapeutics*. New York, McGraw-Hill; 1996, pp. 399-430.
10. Loeser, E.A., Bennet, G., Stanley, T.H., and Machin, R. Comparison of droperidol, haloperidol, and prochlorperazine as postoperative antiemetics. *Can. Anaesth. Soc. J.* 26:125-127, 1979.
11. Babe, K.S. and Serafin, W.E. Histamine, bradykinin, and their antagonists. In: Hardman J.G. and Limbird L.E., eds. *The Pharmacological Basis of Therapeutics*. New York: McGraw-Hill; 1996, pp. 581-600.