Despite advances in technology, postoperative nausea and vomiting (PONV) continues to have a negative impact on patients in both the inpatient and ambulatory surgery setting. Even with advances in drug therapy, anesthesia providers still struggle to find the most beneficial, efficacious, and cost-effective way to prevent and treat PONV. PONV can lead to extended recovery room times, increased management time for nurses and physicians, and use of additional drugs and supplies. Many patients consider PONV to be equally or even more debilitating than the surgical procedure itself. In a survey of ambulatory patients who were dissatisfied with the outcome of their surgery, 71% cited PONV as the reason for their dissatisfaction.

Several commonly used antiemetics are associated with side effects that often cause patients further discomfort. Many anesthesia practices today use a newer class of antiemetics that have fewer side effects. This class of drugs, known as the 5-hydroxytryptamine type 3 (5-HT₃) receptor antagonists, is effective in the treatment and prevention of PONV. Ondansetron and dolasetron are the drugs of this class most commonly used for PONV. Few studies have appeared in the literature directly comparing these 2 drugs in the prophylactic treatment of PONV.

The overall incidence of PONV can be anywhere from 8% to 92%, with an average incidence of 25% to 35%. This rate is highest when certain population groups are studied individually. For example, patients undergoing gynecological procedures have been shown to have a much higher incidence of PONV. Due to the increased incidence of PONV among this population, this study directly compared the effectiveness of ondansetron vs dolasetron in the prevention of PONV in patients having gynecological procedures.

Timing and dosing of both ondansetron and dolasetron appear to have an impact on the efficacy of each drug. Four studies comparing doses of 12.5 mg, 25 mg, 50 mg, or 100 mg of dolasetron in gynecological procedures.

The purpose of this study was to determine if 4 mg of ondansetron and 12.5 mg of dolasetron were equally effective in preventing postoperative nausea and vomiting (PONV) in patients undergoing gynecological procedures. While the overall incidence of PONV appears to be 25% to 35%, the incidence among this patient population is considerably higher.

Patients were assigned to 1 of 2 antiemetic treatment groups. Patients in group 1 received 4 mg of ondansetron at the end of surgery, while patients in group 2 received 12.5 mg of dolasetron at the end of surgery. Data collection occurred perioperatively and in the 24 hours following surgery. χ² determined there was no statistical difference between groups related to emesis in the postanesthesia care unit (PACU), emesis in the 24 hours following surgery, and side effects.

Results of this study showed there was no statistically significant difference between 4 mg of ondansetron or 12.5 mg of dolasetron when administered at the end of surgery for preventing PONV in patients undergoing gynecological procedures. Given the cost difference between these 2 antiemetics, there is a potential for significant cost savings in this high-risk patient population.

Key words: Antiemetics, dolasetron, gynecological procedures, ondansetron, postoperative nausea and vomiting.
ical patients found that 12.5 mg given 15 to 30 minutes before the end of surgery proved to be the most efficacious. Doses of 1 mg, 4 mg, and 8 mg of ondansetron have been compared in studies to determine which is most effective in preventing PONV. Three studies done on gynecological patients determined that 4 mg was the optimal prophylactic dose of ondansetron. Studies have shown ondansetron administration at the end of surgery to be most effective in preventing PONV.

The purpose of this study was to determine if there was a difference between 4 mg of ondansetron and 12.5 mg of dolasetron in emetic episodes in the PACU or in the 24-hour period after PACU stay.

**Methods**

After obtaining local institutional review board approval and written informed consent, 212 ASA physical classification I or II women, age 18 or older, scheduled for inpatient or outpatient gynecological procedures were enrolled in this study at a 625-bed hospital. Patients were excluded if they were under the age of 18, pregnant, received an ASA physical classification of III or greater, experienced emesis 24 hours prior to procedure, or received any antiemetic medication or investigational research drug 24 hours prior to surgery. A sample size of 106 patients per treatment group was required to achieve a power of 80% (2-tailed t test for independent samples, \( \alpha = .05 \)).

A numeric nausea intensity scale (NNIS) was used as a tool for patients to rate their level of nausea at different time intervals postoperatively. The NNIS is an 11-point whole number linear scale where 0 represented “no nausea,” while 10 represented nausea “as bad as it can be.” This scale has been used in several previous studies that assess PONV. A data collection form was used by anesthesia providers to record specified intraoperative data. PACU providers also were given a form to record information obtained during the recovery period. A follow-up survey was used by researchers to gather information regarding the 24 hours following surgery.

Patients were assigned to 1 of the 2 antiemetic treatment groups. Randomization was done by the pharmacy according to a computer-generated, double-blinded protocol. Prior to beginning the study, the anesthesia providers and PACU nurses received training in the blinded data collection process. The patients were randomly assigned to receive either 4 mg of ondansetron or 12.5 mg of dolasetron. The pharmacy prepared the study drugs according to a randomized numbering schedule and diluted to a total volume of 2 mL labeled “study drug.”

Upon admission, patients provided a detailed medical history and demographic information including height, weight, age, nothing by mouth status, history of motion sickness, or previous history of PONV. Patients were asked to complete a baseline NNIS.

On arrival to the operating room, routine monitoring equipment was placed. Because this study was designed to compare the effectiveness of ondansetron and dolasetron across a wide range of anesthesia providers and techniques, providers were allowed to use the medications, agents, and techniques they would normally use for the given gynecological procedure. Anesthesia providers were restricted from giving any other antiemetics preoperatively and intraoperatively, including dexamethasone.

The study drug was delivered to an anesthesia provider who was blinded to the treatment group. The drug was given approximately 15 minutes before the end of surgery. Anesthesia providers reported which medications, agents, and techniques they used. Total anesthesia time, total surgical time, and amount of fluid given also were recorded. Anesthesia time started when entering the operating room and ended when report was given to the receiving nurse in the PACU.

The study tool was passed on from the anesthesia provider to the receiving PACU nurse, who also was blinded to the treatment group. PACU nurses recorded arrival and discharge times; number of emetic episodes and time, if a rescue antiemetic medication was given; and incidence of side effects including headache, dizziness, dysrhythmias, or allergic reaction. PACU nurses also recorded patient-reported NNIS scores at 30 minutes after arrival and at discharge from the PACU. PACU nurses were allowed to administer rescue medication according to postoperative anesthesia orders, which excluded ondansetron and dolasetron, if they determined alternative therapy was needed, if the patient experienced 15 minutes or more of persistent nausea, had 1 or more emetic episodes, or requested medication. For the purposes of this study, an emetic episode was defined as either a single or continuous vomit or retch in any separate 5-minute period.

Patient follow-up was obtained 24 hours after surgery by a primary investigator who also was blinded to the treatment group. Inpatients were visited in their hospital room, and outpatients received a follow-up telephone call. All patients were asked to report their level of nausea according to the NNIS at 4, 8, and 24 hours postsurgery. They were also asked if emesis occurred since leaving the recovery room, how often, and at what time. Incidence of side effects including headache, dizziness, dysrhythmia, and allergic reaction were recorded.
were recorded. Patients were then asked to rate their satisfaction with the overall control of their nausea and vomiting after surgery according to the following: 1 = very satisfied, 2 = satisfied, 3 = neither satisfied or unsatisfied, 4 = unsatisfied, and 5 = very unsatisfied.

Statistical analysis was performed with SPSS, version 9.0 for Windows (Springfield, Ill). Levene’s test for equality of variances determined homogeneity between the 2 groups for comparison. χ² analysis was used to determine if there was a statistical difference between groups related to emesis in PACU, emesis in the 24 hours following surgery, and side effects. The t test for equality of means was used to determine if there was a statistically significant difference between groups related to total PACU times and overall satisfaction scores. A repeated measures test was used to compare numeric nausea intensity scores at 30 minutes after surgery; at discharge from PACU, and at 4, 8, and 24 hours after surgery. Demographic data were analyzed using either a χ² test or t test to determine if statistical differences occurred between groups. If t test analysis determined a statistically significant difference, analysis of covariance was done. Statistically significant factors, if they existed, were then added as covariates.

Results
A total of 106 patients were enrolled in each treatment group. A t test for independent samples revealed no statistically significant difference between the 2 groups with respect to age, height, weight, hours receiving nothing by mouth, amount of fluids given, total anesthesia time, total surgical time, total PACU time, or patient satisfaction scores. Results of the study demonstrated no statistically significant difference in emetic episodes in the PACU or in the 24 hours following surgery. Additionally, no statistically significant difference was found in intraoperative anesthesia variables including inhalation agents, pharmacological adjuncts, or suctioning of the stomach. The only intraoperative variable that displayed a significant difference between groups was administration of spinal narcotic. Thirty-six patients in the ondansetron group received a spinal narcotic, while 23 patients in the dolasetron group received a spinal narcotic. Analysis of covariance demonstrated that the administration of spinal narcotic was not a statistically significant covariate related to the incidence of emesis between the 2 groups. Groups were homogenous with regard to surgical procedure type (abdominal, vaginal, or laparoscopic), previous history of PONV, and previous history of motion sickness, as well as inpatient and outpatient status.

Analysis of mean numeric nausea intensity scores at 30 minutes postoperatively, at discharge from PACU, and at 4, 8, and 24 hours postoperatively demonstrated no statistically significant difference between the 2 groups. Notably, both groups showed an increase in mean nausea scores at 4 hours postoperatively. Total PACU time and overall patient satisfaction scores similarly showed no difference between groups. Additionally, the overall incidence of side effects did not differ between the 2 groups.

Discussion
In our clinical setting, the standard practice is to provide 4 mg of ondansetron as a prophylactic antiemetic for patients undergoing gynecological procedures. The intent of this study was to determine if, over a broad spectrum of anesthetic gynecological procedures, 4 mg of ondansetron and 12.5 mg of dolasetron were equally effective in preventing PONV in this patient population.

The results of this prospective, randomized, double-blind study demonstrated that no statistically significant difference existed between 4 mg of ondansetron and 12.5 mg of dolasetron when administered at the end of surgery for preventing PONV in patients having gynecological procedures. These results are similar to other results found in a study that compared ondansetron and dolasetron in an otolaryngological surgical population. Although, there was no difference noted with respect to the clinical results and patient satisfaction between the 2 groups, a significant cost savings favored the use of 12.5 mg of dolasetron in routine prophylactic treatment of PONV in patients undergoing gynecological procedures. A savings of $500,000 over 1 year was estimated throughout the 4 major hospitals in Spokane, Wash. These cost savings were based upon previous use of ondansetron throughout the citywide system. With the removal of droperidol from the local formulary, the actual savings is probably even higher. It should be noted, however, that this savings is a dual effect of both the product change and education of nursing staff for more appropriate dosing of dolasetron. It also should be noted that this cost savings reflects the use of dolasetron for chemotherapy-induced nausea and vomiting as well as PONV. Nursing labor cost, supplies, and rescue antiemetic costs were not addressed. However, based on the results of this study, it would appear that there would be no difference in these additional costs.

The need for an antiemetic rescue medication was reported in the PACU and over the following 24 hours; however, the type of medication and the number of times it was administered were not addressed.
When comparing the need for a rescue antiemetic medication, there was no statistically significant difference found between the 2 groups \((P = .52)\). Although PACU nurses were trained in the data collection process and blinded to the treatment groups, it could be argued that provider subjectivity influenced the need for rescue antiemetic therapy.

This study did not use a placebo control group. However, numerous studies have shown that both ondansetron and dolasetron were significantly more effective than the placebo groups in the prevention of PONV; therefore, it would be unethical to deny prophylactic antiemetic therapy for this high-risk patient population.

**REFERENCES**


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