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Droperidol versus haloperidol on postoperative nausea and vomiting: a retrospective analysis

Droperidol versus haloperidol en náuseas y vómito posoperatorios: un análisis retrospectivo

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What do we know about this problem?

Postoperative nausea and vomiting risk can be mitigated by the administration of butyrophenone class medications.
Differences of prophylactic administration of droperidol and haloperidol on the mitigation of postoperative nausea and vomiting risk are unknown.
Differences of the level of postoperative sedation with the administration of these two medications are unknown.

What does this study contribute?

The use of inverse probability of treatment weighing analysis found that droperidol administration was associated with lower rates of postoperative nausea and vomiting than haloperidol, but was associated with deeper levels of sedation during anesthesia recovery.

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Abstract

Introduction

Butyrophenones are effective prophylactic drugs against postoperative nausea and vomiting (PONV). Our practice used droperidol for PONV prophylaxis until supply chain issues in 2020 required a substitution to haloperidol.

Objective

To compare the use of these two butyrophenones and their association with the magnitude of reduction PONV and sedation during admission to postanesthesia care unit (PACU).

Methods

Retrospective review of the records of adult surgical patients administered a butyrophenone and admitted to the PACU, from May 2018 through December 2022. PONV was defined as administration of rescue antiemetics during PACU admission. Inverse probability of treatment weighing (IPTW) analysis was performed using generalized estimating equations with robust variance estimates to assess the effects of droperidol and haloperidol on PONV rate.

Results

We identified 905 (2018–2020) and 651 patients (2020–2022) receiving droperidol or haloperidol, respectively. The IPTW PONV rate was 75 (8.3%) for droperidol and 84 (12.9%) haloperidol (odds ratio 0.60; 95% confidence interval 0.41 to 0.87, for the use of droperidol vs haloperidol). Moderate or higher levels of sedation (Richmond Agitation Sedation Scale score ≤ -3) was noted in 163 (18.0) of droperidol and 102 (15.7%) of haloperidol patients, which was nonsignificant, P=0.222, following IPTW adjustment, P=0.269. Median [interquartile range] PACU length of stay was comparable for two butyrophenones, 70 [51, 99] vs. 68 [48, 105] minutes for droperidol vs haloperidol, respectively, P=0.647.

Conclusions

Droperidol was associated with lower rates of PONV during PACU admission than haloperidol, but the rate of sedation was higher.

Keywords:
Droperidol; Haloperidol; Antiemetic; General anesthesia; Comparison.

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Resumen

Introducción: Las butirofenonas son medicamentos profilácticos efectivos contra las náuseas y el vómito posoperatorios (NVPO). En la práctica de los autores de este artículo utilizaron droperidol para la profilaxis de NVPO hasta que los problemas de la cadena de suministro en 2020 requirieron una sustitución por haloperidol.

Objetivo: Comparar el uso de estas dos butirofenonas y su asociación con la magnitud de la reducción de NVPO y la sedación durante la admisión a la unidad de cuidados posanestésicos (UCPA).

Métodos: Revisión retrospectiva de los registros de pacientes quirúrgicos adultos a los que se les administró una butirofenona y fueron admitidos en la UCPA entre mayo de 2018 y diciembre de 2022. La presencia de NVPO se definió como condición para administrar antieméticos de rescate durante la admisión a la UCPA . Se realizó un análisis de ponderación de probabilidad inversa de tratamiento (IPTW, por sus siglas en inglés) utilizando ecuaciones de estimación generalizadas con estimaciones de varianza robusta para evaluar los efectos de droperidol y haloperidol en la tasa de NVPO.

Resultados: Se identificaron 905 pacientes (2018-2020) y 651 pacientes (2020-2022) que recibieron droperidol o haloperidol, respectivamente. La tasa de NVPO IPTW fue de 75 (8,3%) para droperidol y 84 (12,9%) para haloperidol (razón de probabilidades 0,60; intervalo de confianza del 95% [0,41-0,87], para el uso de droperidol vs. haloperidol). Se observaron niveles moderados o superiores de sedación (escala de sedación/agitación de Richmond ≤ -3) en 163 (18,0%) de los pacientes con droperidol y 102 (15,7%) de los pacientes con haloperidol, lo cual no fue significativo, p=0,222, después del ajuste IPTW, p=0,269. La mediana [rango intercuartílico] de la duración de la estancia en la UCPA fue comparable para las dos butirofenonas, 70 [51, 99] vs. 68 [48, 105] minutos para droperidol vs. haloperidol, respectivamente, p=0,647.

Conclusiones: El droperidol se asoció con tasas más bajas de NVPO durante la admisión a la UCPA que el haloperidol, pero la tasa de sedación fue mayor.

Palabras clave: Droperidol; Haloperidol; Antiemético; Anestesia general; Comparación.

INTRODUCTION

Droperidol is an effective prophylactic antiemetic against postoperative nausea and vomiting (PONV). (1) This recommendation is included in the Society for Ambulatory Anesthesia consensus guidelines for prevention of PONV. (2) In 2001 the United States Federal Drug Administration (FDA) issued a black box warning regarding administration of droperidol due to concerns it might prolong the QT interval and potentially induce fatal Torsade de Pointes arrhythmia (TdP). (3) The result was a substantial decrease in droperidol use. (4) However, two large retrospective studies from our institution found no evidence of droperidol-related cardiac dysthymias;(5,6) Consequently, our practice continued its use. (7) However, the availability of droperidol became increasingly unreliable in the United States in 2020,(8) which led our institution to abruptly transition to haloperidol.

Despite the long clinical history of haloperidol and droperidol as antiemetics, there is little data directly comparing their effects on PONV and other anesthetic outcomes. This abrupt transition provided an opportunity to compare effectiveness of these agents in reducing PONV as well as their sedative effects. This study is based on a cohort of general surgical patients undergoing general anesthesia with neuromuscular blockade during the transition from droperidol to haloperidol. The purpose of the study was to determine whether these two butyrophenones have differential effects on rates of PONV and PACU sedation. We hypothesize that the rates of PONV and PACU sedation would be comparable between these two medications and therefore our aim was to compare the use of these two butyrophenones and their association with the magnitude of PONV reduction and sedation during admission to the PACU.

METHODS

This study was approved by the local Institutional Review Board (ID # 22-010072, Ellen R Olson IRB reviewer on October 18, 2022). Consistent with Minnesota Statute 144.295, all patients in this study provided prior written authorization for research use of their health records.

Study design

This retrospective study was conducted in one anesthetic division at a major quaternary academic hospital. We identified all adult patients who underwent abdominal procedures under general anesthesia with neuromuscular blockade, and who were administered intraoperative droperidol or haloperidol and were admitted to PACU. Electronic health records were reviewed for demographics,

health history, perioperative variables, and data regarding the postoperative course. The PACU records were reviewed for the occurrence of PONV, which was defined as the administration of a rescue antiemetic (e.g., ondansetron). In addition, PACU records were reviewed for the deepest level of sedation during admission (assessed using the Richmond Agitation Sedation Scale [RASS]; this 10-point scale ranges from +4 [combative] to −5 [unarousable]) (9), highest level of pain (assessed using an 11 point verbal numeric pain score where a score of 0 is no pain at all and 10 the worst pain imaginable), and PACU duration (assessed from time of PACU admission to the time when PACU discharge criteria was met). (10) Analyses were performed to compare PACU outcomes between patients receiving either droperidol or haloperidol intraoperatively.

Inclusion and exclusion criteria

Included were adult surgical patients (age ≥ 18 years) between May 7, 2018 and July 11, 2022. For patients receiving multiple anesthetics during the study timeframe, only the first procedure was considered. The number of subjects included in this study was determined by the number of eligible patients treated during the study period. Patients were excluded if they did not receive neuromuscular blockade, were not administered haloperidol or droperidol, were not admitted to the PACU after surgery, or did not provide written authorization for the use of their medical records for research purposes.

Clinical practice

The clinical practice is a supervisory model with the anesthetic directed by an attending anesthesiologist and in-room care provided by a nurse anesthetist or anesthesia resident. Our practice is notable for an aggressive PONV prophylaxis regimen for all patients undergoing general anesthesia, regardless of underlying risk. (7) Unless contraindicated, the typical antiemetic prophylaxis regimen consists of the administration of dexamethasone (4 mg), a 5-HT3 selective serotonin receptor inhibitor (ondansetron 4 mg, granisetron 1 mg), and a butyrophenone (droperidol 0.625 mg, haloperidol 1 mg). Our practice made an abrupt change from droperidol to haloperidol on March 8, 2020 due to unreliable supply of droperidol. Because of concerns that haloperidol may be more sedating than droperidol, the clinical practice was to administer haloperidol at the beginning of surgery together with dexamethasone; in the past the practice was to administer droperidol at the conclusion of surgery with the 5-HT3 inhibitor. Additionally, patients who were considered at higher risk for PONV could also have a scopolamine patch applied, be administered neurokinin-1 receptor agonists aprepitant or fosaprepitant, and/or have a propofol infusion during anesthesia. Neuromuscular blockade was used for all patients, and in all cases reversed with neostigmine combined with glycopyrrolate or sugammadex.

The PACU is staffed by registered nurses specialized in postanesthesia care and the attending anesthesiologist is available for immediate assistance. Upon admission and every 15 minutes thereafter patient pain and sedation levels are assessed. The standard treatment for PONV is to administer rescue antiemetics, including ondansetron, granisetron, haloperidol, droperidol, promethazine, and/or metoclopramide. Standard PACU discharge criteria is used. (10)

Data abstraction

The electronic health records were abstracted. Baseline patient characteristics included demographic data, body mass index, current smoking status, and disease burden determined by the American Society of Anesthesiology Physical Status score. Perioperative data included duration of surgery, intraoperative fluids, and perioperative medications including antiemetics, non-opioid analgesics, use of propofol infusion, use of neostigmine/glycopyrrolate or sugammadex to reverse neuromuscular blockade, and intraoperative opioid dose (converted to intravenous morphine equivalents). The PACU records were reviewed for instances of PONV, lowest RASS score, highest pain score, and PACU duration.

Statistical analysis

Baseline patient and procedural characteristics are summarized as mean (standard deviation, SD) or median (interquartile range, IQR) for continuous variables and with frequency (percentages) for categorical variables. Patients were assigned to 'droperidol' or 'haloperidol' groups for analysis, and standardized differences were used to summarize the magnitude of imbalance between groups. Inverse probability of treatment weights (IPTW) were calculated using propensity scores obtained from a multivariable logistic regression model which included all of the listed patient and procedural characteristics as explanatory variables. For both the unweighted and weighted samples, the absolute value of the standard difference between groups is reported for each covariate, with standardized differences < 0.10 considered to indicate adequate balance.

The primary endpoint was a binary variable indicating PONV after administration of either haloperidol or droperidol, but previously described outcomes of interest were also assessed (e.g. PACU length of stay, lowest RASS score, deep sedation and highest pain score). Analyses were performed using generalized estimating equations. For PONV a logit link function was used (binary logistic regression). For lowest RASS and worst pain score, a multinomial distribution and cumulative logit link function was used (ordinal logistic regression). Deep sedation was a binary variable, defined as a RASS

score of less than or equal to minus 3, and was analyzed using a logit link function (binary logistic regression). For PACU length of stay a log transformation was implemented and an identify link function was used (linear regression). For the primary endpoint (PONV), additional subgroup analyses were performed with subgroups defined according to sex (Males vs Females) and age (< 65 vs ≥ 65 years old).

Given the retrospective nature of the current investigation, no formal power analysis was performed. However, in general, for a binary outcome (e.g. PONV) that has an overall incidence of 10%(7) in a cohort where the exposure of interest is present in 40% of the population, a total sample-size of 1500 (900 unexposed and 600 exposed) will provide statistical power of 80% (two-tailed, alpha=0.05) to detect an odds ratio of 1.63. All analyses were performed with SAS statistical software, version 9.4 (SAS Institute, Inc, Cary, North Carolina, United States).

RESULTS

We identified 1,556 patients who met the inclusion criteria; 905 (58.2%) patients were administered droperidol and 651 (41.8%) were administered haloperidol. The median number [IQR] of additional antiemetics was 2 [2, 2] for both groups, and all but eight (0.5%, four each of the groups) patients were administered at least one additional antiemetic. Table 1 presents patient and procedural characteristics of the droperidol and haloperidol patients. There were several clinical characteristics with evidence of imbalance between these groups in unweighted analysis (unweighted standardized differences >0.1) including smoking status; administration of scopolamine patch, acetaminophen, caffeine, dexmedetomidine, midazolam; opioid dose; use of a propofol infusion, and surgical duration. After IPTW adjustment, the groups were well balanced (all weighted standardized differences were ≤0.041, Table 1).

Table 1. Patient and procedural characteristics of patients administered droperidol or haloperidol as prophylactic antiemetics during general anesthesia.

	Unweighted*			Inverse Probability of Treatment Weighted*		
	Droperidol (n=905)	Haloperidol (n=651)	Absolute Std. Diff.	Droperidol	Haloperidol	Absolute Std. Diff.
Age, years	55.8 (41.9, 65.4)	54.2 (41.1, 64.3)	0.071	55.1 (40.7, 64.8)	54.9 (41.1, 65.2)	0.022
Male sex	444 (49%)	320 (49%)	0.002	(49%)	(49%)	0.001
Body mass index, kg/m2	31.6 (26.9, 39.7)	32.7 (27.3, 40.2)	0.094	31.8 (26.9, 40.3)	32.1 (27.0, 39.6)	0.027
Current smoker	25 (3%)	34 (5%)	0.126	(5%)	(4%)	0.041
ASA-PS III/IV	559 (62%)	376 (58%)	0.082	(60%)	(59%)	0.024
Surgical Approach						
Laparoscopic	569 (63%)	398 (61%)	0.036	(62%)	(63%)	0.016
Open	336 (37%)	253 (39%)	0.036	(38%)	(37%)	0.016
Surgical duration, minutes	235 (170, 324)	244 (166, 355)	0.113	236 (168, 334)	233 (162, 339)	0.017
Intraoperative fluid, L	2.1 (1.3, 3.7)	2.0 (1.1, 3.8)	0.009	2.0 (1.2, 3.8)	1.9 (1.1, 3.8)	0.015
Intraoperative IVME, mg	20.0 (12.5, 28.0)	18.0 (10.0, 25.0)	0.124	20.0 (10.0, 27.5)	20.0 (10.0, 25.5)	0.016
Neostigmine	124 (14%)	27 (4%)	0.340	(10%)	(8%)	0.039
Acetaminophen	652 (72%)	557 (86%)	0.335	(78%)	(77%)	0.025
NSAID	151 (17%)	110 (17%)	0.006	(18%)	(18%)	0.008
Caffeine	86 (10%)	102 (16%)	0.187	(11%)	(11%)	0.016
Dexmedetomidine	133 (15%)	206 (32%)	0.410	(22%)	(22%)	0.002
Ketamine	453 (50%)	327 (50%)	0.004	(51%)	(50%)	0.020
Midazolam	173 (19%)	156 (24%)	0.118	(21%)	(21%)	0.006
Propofol infusion	544 (60%)	351 (54%)	0.125	(58%)	(58%)	0.003
Scopolamine	181 (20%)	202 (31%)	0.255	(24%)	(25%)	0.009
Dexamethasone	770 (85%)	570 (88%)	0.072	(86%)	(86%)	0.002
5-HT3 inhibitor	870 (96%)	627 (96%)	0.009	(96%)	(96%)	0.013
Aprepitant/fosaprepitant	209 (23%)	169 (26%)	0.067	(23%)	(23%)	0.009
Disposition						
Admit	758 (84%)	498 (76%)	0.183	(80%)	(79%)	0.011
Ambulatory	95 (10%)	113 (17%)	0.199	(14%)	(14%)	0.013
Inpatient	52 (6%)	40 (6%)	0.017	(6%)	(7%)	0.036

*Data are summarized using n (%) for categorical variables and median (interquartile range) for continuous variables. Inverse probability of treatment weights were calculated using propensity scores obtained from a multivariable logistic regression model which included all of the listed patient and procedural characteristics as explanatory variables. For both the unweighted and weighted samples, the absolute value of the standard difference between groups is reported for each covariate, with standardized differences < 0.10 considered to indicate adequate balance.

ASA-PS = American Society of Anesthesiologists Physical Status; IVME = intravenous morphine equivalents; NSAID = nonsteroidal antiinflammatory drug.

Source: Authors.

Table 2 summarizes the anesthesia recovery course in the PACU between the two groups. In unweighted analysis the number of patients who developed PONV was 75 (8.3%) in the droperidol group and 84 (12.9%) in the haloperidol group, and from IPTW analysis the odds of developing PONV were lower following droperidol vs haloperidol prophylaxis (odds ratio 0.60, 95% confidence interval 0.41, 0.87, P=0.009). When RASS score was treated as an ordinal variable, there was evidence that patients receiving droperidol were more likely to have lower RASS scores (unweighted P<0.001; IPTW P=0.004). However, when deep sedation was defined as a RASS score ≤ -3 the frequency of deep sedation was not found to differ between groups (unweighted P=0.222; IPTW P=0.269). No adverse cardiac events were observed in either group, and postoperative pain scores and PACU duration were similar.

Table 2. Postanesthetic outcomes following antiemetic prophylaxis with droperidol or haloperidol.*

PACU outcome	Unweighted						
	Droperidol (n=905)	Haloperidol (n=651)	p	Inverse Probability of Treatment Weighted†			
				Droperidol	Haloperidol	Estimate (95% CI)	p
PONV	75 (8.3%)	84 (12.9%)	0.003	(8.1%)	(12.8%)	0.60 (0.41, 0.87)	0.009
Lowest RASS score			<0.001			0.72 (0.58, 0.90)	0.004
0	79 (8.7%)	93 (14.3%)		(9.4%)	(13.7%)		
-1	385 (42.5%)	295 (45.3%)		(42.0%)	(46.1%)		
-2	278 (30.7%)	161 (24.7%)		(31.0%)	(25.2%)		
-3	123 (13.6%)	80 (12.3%)		(12.5%)	(11.1%)		
-4	35 (3.9%)	18 (2.8%)		(4.5%)	(3.5%)		
-5	5 (0.6%)	4 (0.6%)		(0.6%)	(0.5%)		
Deep Sedation (RASS ≤ -3)	163 (18.0%)	102 (15.7%)	0.222	(17.6%)	(15.1%)	1.21 (0.87, 1.68)	0.269
Worst pain score (0-10)	5 (1, 7)	5 (0, 7)	0.789	5 (1, 7)	5 (1, 7)	0.86 (0.70, 1.06)	0.155
PACU length of stay, minutes	69 (50, 98)	67 (48, 101)	0.729	70, (51, 99)	68 (48, 103)	1.01 (0.94, 1.09)	0.749

*Data are summarized as n (%) for PONV and lowest RASS score, and median (Q1, Q3) for maximum pain score and PACU length of stay.
†Analyses were performed using generalized estimating equations. For PONV, and deep sedation, a logit link function was used (binary logistic regression), for lowest RASS and worst pain a multinomial distribution and cumulative logit link function was used (ordinal logistic regression) and for PACU length of stay a log transformation was employed and an identify link function was used (linear regression). For PONV, lowest RASS score, deep sedation and worst pain the results are summarized by presenting the odds ratio estimate. For PONV and deep sedation, an odds ratio < 1.0 corresponds to lower odds of the given outcome for patients who received droperidol versus haloperidol. For lowest RASS and worst pain, an odds ratio of < 1.0 corresponds to lower odds of having a higher value of the given outcome for patients who received droperidol versus haloperidol. For PACU length of stay the results are summarized by presenting the estimate for the ratio of the geometric mean with an estimate > 1.0 corresponding to an increased length of stay for droperidol vs haloperidol.
PACU = postanesthesia care unit; PONV = postoperative nausea and vomiting; RASS = Richmond agitation/sedation scale.
Source: Authors.

Table 3. PONV analyzed separately for subgroups defined by age and sex.

PACU outcome	Unweighted						
	Droperidol (n=905)	Haloperidol (n=651)	p	Inverse Probability of Treatment Weighted†			
				Droperidol	Haloperidol	Estimate (95% CI)	p
By Sex							
Female, n	461	331					
PONV, n (%)	53 (11.5%)	57 (17.2%)	0.023	(10.8%)	(17.7%)	0.57 (0.36, 0.90)	0.014
Male, n	444	320					
PONV, n (%)	22 (5.0%)	27 (8.4%)	0.055	(5.2%)	(7.7%)	0.66 (0.35, 1.24)	0.196
By Age							
< 65 years, n	672	499					
PONV, n (%)	62 (9.2%)	75 (15.0%)	0.003	(8.9%)	(15.3)	0.55 (0.36, 0.82)	0.003
> 65 years, n	233	152					
PONV, n (%)	13 (5.6%)	9 (5.9%)	0.888	(5.52)	(5.76)	0.96 (0.37, 2.46)	0.925

†Analyses were performed using generalized estimating equations with a logit link function (binary logistic regression), Results are summarized by presenting the odds ratio estimate, where an odds ratio < 1.0 corresponds to lower odds of PONV for patients who received droperidol versus haloperidol. From models which included the interaction term, the effect of antiemetic on the frequency of PONV was not found to differ significantly between males and females (sex-by-antiemetic interaction p=0.706, or between age groups (age-by-antiemetic interaction p=0.281).
PACU = postanesthesia care unit; PONV = postoperative nausea and vomiting.
Source: Authors.

Table 3 summaries the subgroup analyses assessing differences in the frequency of PONV between antiemetic groups for subgroups defined by sex and age. The results are statistically significant for females, but not males; and statistically significant for patients <65, but not ≥65 years old. However, in both cases the interaction p-value was not significant (sex-by-antiemetic interaction p=0.706; age-by-antiemetic interaction p=0.281).

DISCUSSION

The study compares the rates of PONV assessed based on use of rescue antiemetics, in a cohort of adult patients undergoing general procedures who received an antiemetic regimen which included either droperidol or haloperidol. According to the findings, the administration of droperidol as a multimodal prophylactic antiemetic approach was associated with 37% lower PONV rate as compared against haloperidol use. While there was evidence suggesting an association between droperidol administration and greater sedation, the overall rate of moderate to deep sedation was not significantly different between the two groups. Other measures of anesthesia admission, PACU duration and pain scores, were not statistically different between groups.

The is little evidence regarding the comparative efficacy of droperidol and haloperidol as prophylactic antiemetics. (11) Wang et al(12) conducted a prospective trial comparing haloperidol (1 mg), droperidol (0.625 mg) and placebo in 150 healthy women undergoing laparoscopic gynecological surgery and found comparable rates of the use of rescue antiemetics in the recovery room among patients administered haloperidol (13%) and droperidol (16%). Chu et al(13) randomized 400 women undergoing laparoscopic assisted vaginal hysterectomy to droperidol (1.25 mg), haloperidol (2 mg), dexamethasone (5 mg), haloperidol (2 mg) and dexamethasone (5 mg), or placebo (80 subjects in each arm) and found an incidence of PONV in the first 24 postsurgical hours of 36% for droperidol, 37% for haloperidol, 38% for dexamethasone, 19% for the haloperidol and dexamethasone combination, and 65% for the placebo group. An important difference between our study and Wang et al.(12) is that our practice is to use multiple prophylactic antiemetic medications rather than a single agent. There is strong evidence to support the use of multiple antiemetic prophylactic agents,(2) and this was demonstrated in the study by Chu et al.(13) where the combination of haloperidol and dexamethasone had superior antiemetic effect than single agents.

Our study indicates that the PACU sedation scores were lower among patients receiving droperidol versus haloperidol; however, the overall rate of moderate to deep sedation were similar between the two groups. Studies by Chu et al.(13) and Wang et al.(12) found no difference in postoperative sedation between patients who received these two medications. One possible explanation for our observation is that our practice administers haloperidol at the beginning of surgery and droperidol at the end. Regardless, the PACU duration was similar between the patients who received these two drugs. These differences in the timing of drug administration could also have influenced the rates of PONV; it is possible that droperidol may have a stronger effect because it was administered at the end of the case and thus plasma levels are expected to be higher than haloperidol administered at the beginning of the surgery.

The FDA's black box warning regarding droperidol and prolonged QT interval has been controversial among the anesthesia community. (11) The evidence from large surgical cohorts has not endorsed this concern with antiemetic prophylactic doses of droperidol. (5, 6, 14) The FDA also has a warning regarding the use of intravenous haloperidol and QT-prolongation and torsades de pointes (TdP) arrhythmia, and specifically states that haloperidol is not approved for intravenous administration and if administered by this route then the patient should be under ECG monitoring. (15) Similarly, the FDA has issued a warning against prolonged QT interval and ondansetron. (16) A retrospective study of 32,737 patients receiving perioperative ondansetron found no episodes of TdP following its administration.(17) Another retrospective study of 19,874 patients who were administered haloperidol, dexamethasone, and ondansetron found no episodes of TdP.(8) This study found no evidence of electrophysiologic complications in either group.

This study has the limitations inherent to with a single center retrospective study. Because the prophylactic antiemetic regimen was not standardized, it is possible that unmeasured variables could have influenced decisions regarding antiemetic perioperative management. In particular, our healthcare records do not reliably document a prior history of PONV or motion sickness, important risk factors for PONV (18), so these were not included in our analysis. Although we used propensity scores and IPTW, this approach can only adjust for measured confounders. Our data does not include data on the intensity of PONV. The use of rescue antiemetics in the PACU likely captured the majority of severe PONV episodes, but mild and untreated PONV episodes may have been undocumented, thus our incidence rate may be underestimated. Lastly, we only considered PONV cases in the PACU, thus cannot account for subsequent PONV episodes after PACU discharge.

CONCLUSION

This retrospective study found that droperidol, as part of a multi-drug PONV prophylaxis regimen, was associated with lower PONV rates than a regimen using haloperidol. However, more patients were sedated

when administered droperidol than haloperidol. These findings suggest that droperidol may be more beneficial than haloperidol for patients at high risk for PONV.

ETHICAL DISCLOSURES

Ethics committee approval

This study was approved by the local Institutional Review Board (ID # 22-010072, Ellen R Olson IRB reviewer on October 18, 2022). Consistent with Minnesota Statute 144.295, all patients in this study provided prior written authorization for research use of their health records.

Protection of human and animal subjects

The authors declare that no experiments were performed on humans or animals for this study. The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Confidentiality of data

The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent

The authors declare that no patient data are disclosed in this article. Consistent with Minnesota Statute 144.295, all patients in this study provided prior written authorization for research use of their health records. The corresponding author is in possession of this document.

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Authors' contributions

MCY and OA: data collection, interpretation of results, and initial writing of the manuscript.
JN and YNM: Conception of the original project, study planning, interpretation of results, and final writing and approval of the manuscript.
DRS: Statistical analysis, final writing of the manuscript.
JS and TNW: Study planning, interpretation of results, data analysis, and final writing of the manuscript.

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Adherence to international guidelines for appropriate and complete research reporting:

This study follows the international Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for reporting observational cohort studies.

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Conflicts of Interest

TNW reports financial support from Medtronic, Merck & CO, Trevena Inc, and Takeda Pharmaceutical Company. All other authors have no conflicts to report.

Presentations

None declared.

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