

Dynamic risk profiling for postoperative nausea and vomiting after implementation of an enhanced recovery pathway for surgical weight loss patients

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Introduction

Enhanced recovery pathways (ERP) have been shown to reduce postoperative length of stay (LOS) without increasing morbidity in surgical weight loss (SWL) patients.¹ We implemented an ERP for SWL patients that resulted in >80% of patients being discharged on postoperative day 1.² Despite the incorporation of risk-based prophylaxis into this ERP,³ postoperative nausea and vomiting (PONV) continues to be an issue. The goal of this study was to identify areas for improvement with dynamic risk profiling a population at high-risk for PONV.

Methods

An ERP was implemented in January 2015. Records were obtained for patients undergoing robotic or laparoscopic gastric bypass/sleeve gastrectomy (1/28/15 – 11/7/16). Baseline characteristics, Apfel scores, and number of anti-emetics administered in the PACU and inpatient unit were obtained. Postoperative LOS was determined by calculating the time from surgery start to hospital discharge and subtracting the operative time, with prolonged LOS defined as one that spans two midnights. Causes of prolonged LOS were determined via manual review of daily progress notes and discharge summaries. Multiple logistic regression, analysis of variance with Tukey follow-up, and Kruskal-Wallis tests were used where appropriate. $P < 0.05$ was considered significant.

Results

A total of 767 charts were reviewed. Patient demographics, stratified by Apfel score, are shown in Table 1. Almost half of patients (46.2%) required at least one anti-emetic in the PACU. Higher Apfel score was associated with increased anti-emetic use in the PACU ($H=21.4$; $p < .0001$). Among patients who received anti-emetics in the PACU or inpatient unit, receiving at least one anti-emetic in the PACU was associated with an increased frequency of further postoperative administration ($F=61.55$; $p < .0001$). Tukey follow-up showed that significant changes in dosing frequency occurred when patients required 2-3 PACU anti-emetics (rescue dosing needed q8-10h) or 4 PACU anti-emetics (rescue dosing needed q6h) ($P < 0.05$). Requiring PACU anti-emetics increased the odds of a prolonged LOS due to PONV (OR 1.7 for each dose; $p < 0.0001$). Apfel score was not associated with increased frequency of anti-emetic administration or prolonged LOS.

Conclusions

As previously reported, patients with higher Apfel scores required more anti-emetics in the PACU. Interestingly, regardless of Apfel score, PACU anti-emetic administration was associated with increased frequency of administration during the inpatient stay and a prolonged LOS. These findings show that while the Apfel score is important for determining appropriate PONV prophylaxis and PACU risk of PONV, administration of rescue anti-emetics in the PACU can help determine whether SWL patients will experience persistent PONV requiring ongoing treatment and predict an increased risk of prolonged LOS due to PONV. Taken together, these findings may allow for dynamic risk profiling such that patients who require PONV treatment in the PACU receive more aggressive, and possibly scheduled, anti-emetic therapy as an inpatient in order to improve patient satisfaction and reduce risk of prolonged LOS.

References

1. Lemanu DP, et al. *BJS*. 2013;100:482-9. 2. McEvoy MD, et al. *ASA Symposium 2015*. 3. Gan TJ, et al. *Anesth Analg*. 2014;118:85-113.

Table 1: Patient Characteristics by Apfel Score (N=767)				
	Apfel 1 (N=98, 13%)	Apfel 2 (N=365, 48%)	Apfel 3 (N=241, 31%)	Apfel 4 (N=63, 8%)
Age	47.1 (11.0)	44.8 (11.6)	44.7 (10.7)	45.0 (10.6)
Female Gender	0 (0%)	307 (66%)	236 (98%)	63 (100%)
BMI	48.4 (9.1)	47.5 (7.2)	46.1 (8.2)	45.3 (6.0)