Variables impacting postoperative opioid consumption following bariatric surgery

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Background

- Unregulated opioid-prescribing habits have contributed to a major public health crisis that threatens the economic, social, and medical welfares of millions of Americans.
- Patients undergoing bariatric surgery are especially vulnerable to multiple studies demonstrating increased risk of developing and prolonging chronic opioid dependency[1,2]
- Patients undergoing bariatric surgery with concomitant opioid dependency have overall worse outcomes: less weight loss, higher rates of anxiety and depression, overall less satisfaction with bariatric surgery[3]
- Alternatives to opioid analgesia, when incorporated into standardized postoperative management pathways, such as enhanced recovery after surgery (ERAS) pathways, can potentially minimize perioperative opioid use without sacrificing patient outcomes
- Designing ERAS pathways that minimize perioperative opioid use need to account for practice- and patient-specific variables that may impact their success

Study Objective

Using a single-center prospective cohort of 317 adults undergoing bariatric surgery (between June 2018 and Dec 2019), we aim to identify intraoperative factors associated with postoperative opioid use

Patients and Methods

Outcome Variable

Postoperative opioid use (POU): number of morphine milligram equivalents (MMEs) given during a patient's inpatient postoperative stay

Variables of Interest

- Intraoperative opioid use (IOU): number of MMEs provided by anesthesiology intraoperatively and in the post-anesthesia care unit
- American Society of Anesthesiologists (ASA) classification
- Obesity-related comorbidities
  - Diabetes mellitus (DM)
  - Hypertension (HTN
  - Dyslipidemia (HLD)
  - Gastroesophageal reflux disorder (GERD)
  - Obstructive sleep apnea (OSA)
- Operative time
- Length of stay
- Drain placement
- Preop opioid use

Statistical Analyses*

- Correlation between IOU and POU was measured by calculating a Pearson's *r*
- Using the forward selection method, a multivariable regression model was created and used to identify independently significant variables associated with POU

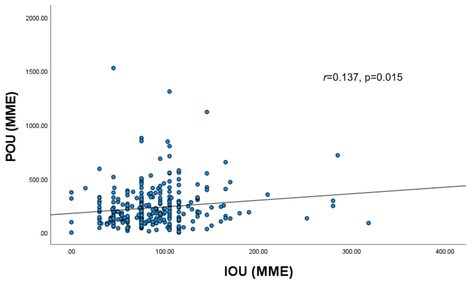
*All statistical analyses completed with SPSS v27.0 (IBM Corp; Armonk, NY; 2020

Results

Patient Demographics

Characteristics	Prospective Cohort (N = 317)
BMI [mean±SD]	52.0±12.0
ASA Class [n (%)]	
II	92 (29.2)
III	210 (66.7)
IV	13 (4.1)
Comorbidities [n (%)]	274 (87)
Hypertension	214 (67.9)
OSA	179 (56.8)
GERD	136 (43.2)
Diabetes	99 (31.4)
Dyslipidemia	98 (31.1)
Type of procedure	
Gastric bypass	186 (59)
Sleeve gastrectomy	129 (41)
Drain placement [n (%)]	14 (4.4)
Operative time (min) [mean±SD]	140.8±71.8
LOS [median, IQR]	2.0, 2.0-3.0
Preop opioid [n (%)]	91 (28.9)
IOU [median, IQR]	75.0, 60.0-105.0
POU [median, IQR]	186.0, 115.0-297.0

IOU is correlated with POU (*r*=0.137, p=0.015)



Univariate Analysis

Variable	Unstandardized β [95% CI]	Standardized β	p-value
IOU*	0.608 [0.118, 1.097]	0.137	0.015
ASA Class*	40.2 [0.4, 80.0]	0.112	0.048
OR Time*	0.364 [0.076, 0.651]	0.139	0.013
BMI	1.6 [-0.1, 3.4]	0.106	0.060
Drain*	150.5 [50.9, 250.1]	0.166	0.003
Comorbidity*	-69.1 [-130.5, -7.7]	-0.124	0.028
Preop opioid*	72.6 [27.4, 117.8]	0.176	0.002
LOS*	39.0 [29.5, 48.5]	0.415	< 0.001

Several variables were associated with POU in univariate analysis

Multivariate Regression

Variable	Unstandardized β [95% CI]	Standardized β	p-value
LOS	35.6 [26.2, 45.0]	0.379	< 0.001
Preop	48.7 [7.0, 90.5]	0.118	0.022
Comorbidity	-90.6 [-147.1, -34.0]	-0.163	0.002
ASA Class	50.5 [14.1, 87.0]	0.140	0.007
IOU	0.448 [0.003, 0.893]	0.101	0.049

IOU remained an independent predictor of POU after correcting for LOS, preoperative opioid use, presence of obesity-related comorbidity, and ASA classification

Conclusions and Future DIrections

- **IOU was an independent predictor of POU, suggesting ERAS pathways that modulate intraoperative opioid utilization have the potential to minimize postoperative opioid use**
- **A major strength of this study is that it identifies factors associated with POU in morbidly obese patients, who can experience and treat their pain differently than other patient populations**
- **Future studies should aim to identify whether the relationship between IOU and POU is preserved after patients are discharged from the hospital**
- **Additional studies are needed to determine other modifiable variables to incorporate in ERAS pathways for bariatric surgery to minimize perioperative opioid use.**

References and Acknowledgments

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