



Original article

Factors associated with bariatric postoperative emergency department visits

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Abstract

Background: Unplanned bariatric postoperative emergency department (ED) visits occur frequently and may represent inadequate coordination of postdischarge care. Multicenter data on this outcome is limited, as this metric has not traditionally been tracked in large clinical databases.

Objectives: To describe the frequency of and risk factors associated with 90-day postoperative ED visits after bariatric surgery.

Setting: Truven Health Analytics MarketScan database.

Methods: All patients undergoing primary bariatric operations in the 2012 and 2013 MarketScan database were included. The primary outcome was the presence of an ED visit not resulting in a hospital readmission within 90 days of surgical discharge. Risk factors and demographic characteristics evaluated included age, sex, co-morbidities, insurance type, region, operation type, prior ED visits within 1 year, and index admission length of stay.

Results: Postoperative ED visits not associated with an inpatient admission occurred in 14.6% of patients. The most common diagnoses associated with these visits were abdominal pain (24.4%) and dehydration, nausea, or vomiting (20.8%). On multivariate analysis, younger age, female sex, greater number of co-morbidities, north-central region, open bariatric or laparoscopic gastric bypass operations, ≥ 2 prior ED visits, and increased initial length of stay were all associated with increased odds of an ED visit.

Conclusions: Postoperative ED visits are a frequent and potentially preventable occurrence with several risk factors. Tracking this metric as a quality indicator will allow for targeted interventions to improve the transition of care to the outpatient setting after bariatric surgery. (Surg Obes Relat Dis 2016;■:00–00.) © 2016 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords:

Bariatric surgery; Emergency department use; Outcomes; Bariatric quality metric

Bariatric surgery has consistently been shown to be the most effective obesity treatment for achieving long-term weight loss and improving obesity-related co-morbidities [1–3]. With the advancement of minimally invasive

techniques and rigorous accreditation standards, the safety of bariatric operations continues to improve. However, despite a mortality rate of $<1\%$ [4,5], certain types of preventable morbidity associated with these operations remains relatively high.

The rate of hospital readmissions after bariatric surgery has emerged as a frequently evaluated quality metric that likely serves as a proxy for several different aspects of postoperative morbidity. Often, the factors leading to

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bariatric readmissions are preventable and frequently a result of dehydration, diet intolerance, or nonspecific abdominal pain [6]. While there has been an abundance of literature focused on bariatric readmissions [6–11], much less attention has been centered on unplanned emergency department (ED) visits. Postoperative ED visits are often due to similar preventable factors as readmissions, but occur even more frequently, and as many as 75% of bariatric patients who present to the ED do not require inpatient admission [12]. However, because these ED visits were not tracked in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database before January 2016, there is limited multicenter data on this aspect of morbidity and healthcare utilization. The aim of this study is to describe the prevalence of and risk factors for 90-day postoperative ED visits after bariatric surgery that do not result in a hospital readmission.

Methods

We performed our analysis using the Truven Health Analytics MarketScan database from 2011 to 2013. This database is composed of de-identified administrative claims from a sample of large employers and health plans throughout the United States. The most recent year of claims data includes approximately 78 million predominately middle-class employees as well as their spouses and dependents [13]. Inpatient claims from the index operation and outpatient claims, including ED visits, were linked for each distinct enrollee. This study was approved by the Institutional Review Board of Boston University Medical Campus and Boston Medical Center.

We included patients aged 18 to 65 who underwent a bariatric procedure for the treatment of morbid obesity from January 2012 to September 2013. Patients were included if they had both a diagnosis-related group (DRG) code corresponding to a procedure for obesity (619, 620, 621) and a current procedural terminology (CPT) code for any of the following procedure types: open gastric bypass (43846, 43847), open vertical banded gastroplasty (43842, 43843), open biliopancreatic diversion with or without duodenal switch (43845, 43633), laparoscopic gastric bypass (43644, 43645), laparoscopic sleeve gastrectomy (43775), and laparoscopic adjustable gastric band (43770). CPT codes for revisional bariatric operations were excluded. Additionally, patients were required to have continuous enrollment for 1 year before surgery and 90 days after surgery to ensure complete assessment of preoperative co-morbidities and postoperative follow-up.

Our primary outcome was the occurrence of a postoperative ED visit within 90 days that did not result in an inpatient readmission. We further described our primary outcome by looking at the time after surgery, principal diagnosis, and gross payments to a provider for each ED visit. As defined by MarketScan, the gross payment equals

the amount eligible for payment under the medical plan terms after applying rules such as discounts, but before applying coordination of benefits, copayments, and deductibles [13].

Independent demographic variables included sex, age, and region. Surgery type was grouped into 4 categories: laparoscopic sleeve gastrectomy, laparoscopic gastric bypass, laparoscopic adjustable gastric banding, and all open bariatric procedures. Length of stay for the index admission was evaluated as a continuous variable with top-coding at a maximum of 5 days to reduce the effect of a few high outliers. The Elixhauser Index was modified to exclude the co-morbidities of morbid obesity or weight loss due to confounding with our study population [14]. We also adjusted for prior ED visits within 1 year and categorized them into 0, 1, or ≥ 2 visits. Insurance plan type was grouped into least, intermediate, and most restrictive categories based on whether incentives to use particular providers exist, primary care physicians are assigned, and out-of-network services are covered for each plan.

We evaluated our sample by performing descriptive statistics for all independent variables and our primary outcome. To explore the association between independent variables and the primary outcome, we conducted bivariate analyses using the Pearson χ^2 test for categorical variables and the t test for continuous variables. Multiple logistic regression was then used to construct our model using independent variables that were statistically significant in our bivariate analyses ($P < .05$). Several interactions were evaluated to assess their effect on our model, including the interaction between procedure and length of stay, age and co-morbidities, and age and sex. The calibration and discrimination of the model were assessed using the Hosmer-Lemeshow goodness-of-fit test and the C statistic, respectively.

Results

Descriptive characteristics of the study sample are shown in Table 1. A total of 36,673 patients underwent a bariatric operation in 2012 or 2013 and met the remainder of our inclusion criteria. The majority of patients in our sample were female (77.5%), aged 35 to 44 years (31.5%), with 2 co-morbidities (25.7%), from the South (40.6%), with no prior ED visits (71.8%), and enrolled in a least-restrictive insurance plan (68.4%). The frequency of different types of operations in our sample was consistent with the changing distribution of bariatric procedures seen in prior studies [15,16]. Laparoscopic sleeve gastrectomy accounted for the majority of operations (47.5%), followed by laparoscopic gastric bypass (33.4%), laparoscopic gastric adjustable banding (17.4%), and all open operations (1.7%).

In our sample population, 14.6% of patients ($n = 5367$) had at least one ED visit not resulting in an inpatient admission within 90 days of surgery discharge. Among

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