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Original article

Evaluating organizational factors associated with postoperative bariatric surgery readmissions

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Abstract

Background: Several patient and surgical characteristics have been identified as risk factors for readmission after bariatric surgery, but there is a paucity of information on how organizational factors influence this metric.

Objective: To evaluate the association between readmissions and several organizational factors, including compliance with best practices to reduce unplanned hospital visits, major complication rates, and the emergency department-sourced readmission (EDSR) rate.

Methods: The Michigan Bariatric Surgery Collaborative database was used to identify patients undergoing primary bariatric procedures. Using an indirect standardization process, each site's observed-to-expected ratio for 30-day readmissions was calculated. The association between each site's adjusted readmission rate and each organizational factor was calculated with Pearson correlation coefficients.

Results: There was significant variation among the sites' adjusted rates of readmission, EDSR, best practice compliance rates, and major complication rates. There was a moderate association between each site's adjusted readmission rate and the rate of EDSR ($r = .53$) and major complications ($r = .53$). However, the association between bariatric centers' compliance with best practices to reduce unplanned hospital visits and readmission rates was fairly weak ($r = -.14$).

Conclusion: Bariatric centers with higher rates of major complications and sites with emergency departments that are less likely to treat and discharge patients are more likely to have higher readmission rates. Even though compliance with best practices to reduce readmissions may be important, results suggest that it does not significantly influence the readmission rates at sites that perform only these basic measures or perform them inadequately. (Surg Obes Relat Dis 2016;■:00–00.) © 2016 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords:

Bariatric surgery; Readmissions; Emergency department characteristics; Postoperative complications

The safety of bariatric surgery has improved greatly over the last decade, but still, certain preventable morbidity associated with this procedure remains relatively high. Hospital readmissions have emerged as a quality metric that encompasses several aspects of postoperative morbidity

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and deficiencies in the transition from inpatient to outpatient care [1,2]. Rates of readmission after bariatric surgery vary in the literature but range from 4% to 8% [3–5]. There has been an increased emphasis at the local and national levels to reduce bariatric surgery readmission rates, most recently with the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program's Decreasing Readmissions through Opportunities Provided (DROP) program [3].

Even though several patient and surgical risk factors for readmission have been identified, there is relatively little information on how organizational characteristics at the institution level contribute to unplanned hospital visits after bariatric surgery. In addition, little is known about how emergency departments (EDs) differ in their ability to manage bariatric patients and whether this contributes to readmission rates. Prior studies have found significant variation among providers and facilities in rates of hospital readmission from the ED, a metric the authors have coined the emergency department-sourced readmission rate (EDSR) [6,7]. The objective of this study was to evaluate the association between bariatric surgery readmission rates and several organizational characteristics, including the compliance with best practices to reduce unplanned hospital visits, institutional complication rates for bariatric surgery, and the EDSR rate for bariatric patients.

Methods

Data sources and sample

The Michigan Bariatric Surgery Collaborative (MBSC) clinical outcomes database was used to identify the sample of bariatric patients. The 40 MBSC sites used in this analysis were quite diverse with regard to their procedural volume and hospital size, with both small community hospitals and larger academic centers. All patients within the MBSC database undergoing a primary bariatric procedure were included in the study sample. Patients from 5 sites that had <100 patients in the database were excluded. In addition, as part of this collaborative, survey data on best practices to reduce readmissions was completed for 37 of the 40 sites used in this analysis (centers without survey data were excluded from calculations on best practices).

Variables and outcome measures

Independent variables used in the multivariable logistic regression model and indirect standardization procedure included age; sex; preoperative body mass index (BMI); total co-morbidities; surgery type (gastric bypass, adjustable gastric banding, sleeve gastrectomy, and biliopancreatic diversion with duodenal switch); surgery approach (open or minimally invasive); initial hospital length of stay; insurance (Medicare, Medicaid, private, other); year; and hospital size (<100, 100–299, 300–499, >500 total hospital beds/institution). Of note, the MBSC database contains

a separate variable to track “observation” stays, and these were excluded from the outcome measure of 30-day readmissions.

Major complications were defined as any potentially life-threatening complication (e.g., anastomotic leak, respiratory failure, myocardial infarction) per the MBSC standard definition. The EDSR variable was defined as the percentage of bariatric patients who were readmitted to the hospital after an ED visit. A readmission was counted as “ED-sourced,” opposed to a direct admission to the hospital, if it occurred on the same date or the day after an ED visit to account for possible time spent in the ED overnight before being admitted.

A composite measure of best practice compliance was calculated for each site based on the number of measures that sites reported performing out of the total number of survey measures. Survey measures were divided into preoperative, inpatient, and postoperative practices. Preoperative practices included showing an educational video, scheduling a postoperative appointment before surgery, writing postoperative prescriptions before surgery, and providing at least 3 phone numbers that can be contacted if issues arose. Inpatient measures included the presence of a patient pathway, clinical pathway, and dietician consult and whether instructions on follow-up care were given. Postoperative practices included calling the patient within 48 hours of discharge, scheduling a follow-up appointment within 30 days, communicating with the primary care physician, and having a process instituted for review of readmissions.

Statistical analysis

First, descriptive statistics were performed to characterize the study population. Next, multivariable logistic regression modeling was used to identify which variables were associated with 30-day readmissions. An indirect standardization procedure was performed to identify risk-adjusted readmission rates and observed-to-expected ratios for each site. In this process, readmission rates were adjusted for by age, sex, BMI, co-morbidities, surgery type and approach, hospital length of stay, insurance type, procedure year, and hospital size. The MBSC site was included in this hierarchical logistic model as a random effects variable to control for clustering effects of the sites. Pearson correlation coefficients were then used to evaluate the strength of the association between each site's risk-adjusted readmission rates and organizational factors, including rates of EDSR, major complications, and compliance with best practices. All statistical procedures were performed using SAS 9.3 (SAS Inc. Institute, Cary, NC).

Results

The analysis sample comprised 57,238 patients with demographic characteristics that were typical of the national

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