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Integrated health article

Frequency of laboratory testing among gastric bypass patients

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Abstract

Background: Long-term laboratory monitoring is recommended after gastric bypass surgery to prevent the development of micronutrient deficiencies. The objective of this study was to characterize patterns of laboratory monitoring after surgery.

Methods: We used a large insurance claims database to assess the frequency of laboratory testing after gastric bypass surgery. We assessed the tests recommended by an expert panel on bariatric surgery, including tests recommended routinely as well as second-line tests for specific clinical scenarios (e.g., tests for anemia when iron deficiency is not present).

Results: With the exception of testing for diabetes, most gastric bypass patients did not undergo routine laboratory testing in the first year after their surgery, ranging from 54% (electrolytes) to 95% (zinc). However, for first-line tests, significantly more gastric bypass patients underwent testing in the first year,compared with gastric banding patients. Differences in testing frequency between gastric bypass and gastric banding patients were larger for tests of micronutrient deficiency than for common metabolic panels and complete blood counts. For second-line tests, much smaller percentages of both groups of patients underwent testing, either in the first year or after year 1.

Conclusion: Patients undergoing gastric bypass do not routinely undergo recommended laboratory tests, although they are undergoing more monitoring than gastric banding patients. Efforts must be made by patients, surgeons, and primary care providers to ensure that routine testing is done to lower the risk of adverse health outcomes. (Surg Obes Relat Dis 2014;10:340–347.)

Keywords: Bariatric surgery; Obesity surgery; Quality of care; Nutrition assessment; Clinical care

Bariatric surgery for severe obesity is a common surgical procedure, both in the United States and worldwide [1]. A combined expert panel of the American Association of Clinical Endocrinologists (AACE), The Obesity Society (TOS), and the American Society for Metabolic and Bariatric Surgery (ASMBS) recommended that patients who have malabsorptive procedures (e.g., gastric bypass) undergo routine laboratory monitoring due to the risk of nutritional deficiencies [2]. The rationale for routine monitoring is that some micronutrient deficiencies (e.g., thiamine, vitamin B12) are associated with irreversible health complications. A number of studies have documented that patients undergoing malabsorptive procedures may develop deficiencies, even with routine supplementation [3–7]. The frequency of postoperative lab monitoring could be considered a measure of quality of care for this patient population.

Parts of these data were presented as an abstract at the 2013 annual meeting of the Society of General Internal Medicine (SGIM) in Denver, Colorado.

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We sought to evaluate whether or not patients are undergoing this monitoring. Specifically, we evaluated (1) how often gastric bypass and gastric banding patients undergo laboratory testing for tests that are recommended routinely (first-line tests), (2) for differences in testing frequency between patients undergoing gastric bypass and those undergoing gastric banding, and (3) to what extent gastric bypass patients undergo testing for second-line tests that are indicated for specific nutrient deficiencies. We hypothesized that (1) overall testing frequency would be less than recommended; (2) gastric bypass patients and gastric banding patients would have similar rates of testing for metabolic panels and complete blood count, but gastric bypass patients would have more frequent testing for micronutrients (e.g., B12, vitamin D) [8]; and (3) second-line tests would be checked less frequently than routinely recommended tests.

Methods

Data for this analysis came from the PharMetrics Inc., LifeLink Health Plan Claims Database [9], a longitudinal database that includes integrated, patient-level claims across the United States from > 70 million patients. The database contains all records in which a lab test was billed to an insurance payor. The database does not include the test result, only whether the test was performed. Bariatric surgical patients were identified by current procedural terminology (CPT) codes for the surgical procedure they had. The CPT codes used for the analysis are listed in tables. Any lab test linked to a patient with one of the CPT codes used was included in the analysis. The analysis included all time after the procedure code and for which the patient was covered by 1 of the >80 insurance payors in the database. This analysis was exempted from review by the institutional review board at our institution.

We queried the database for the set of tests recommended by the AACE/TOS/ASMBS expert panel. The minimum set of tests ("first-line tests") recommended include those needed to monitor for common nutritional deficiencies and for inadequate oral intake (electrolytes, complete blood count, iron studies, vitamin B12, vitamin D, and zinc), tests to monitor the status of co-morbid conditions (lipid panel, glucose, HbA_{1c}), as well as tests that accomplish both purposes (liver associated enzymes). The panel also recommended additional tests for specific clinical situations (i.e., "second-line tests"). For example, assessment of folate, copper, and selenium is indicated in patients with anemia who do not have evidence of iron deficiency. We evaluated first-line tests as our primary outcome and included second-line tests as an exploratory analysis. We limited evaluation of HbA_{1c} and glucose testing to patients with an ICD-9 (international classification of diseases) code for diabetes. We looked for each test alone (potassium, calcium) and also as part of lab panels (basic metabolic panel, comprehensive metabolic panel). The original AACE/TOS/ASMBS guidelines did not recommend routine laboratory testing for patients undergoing gastric banding [10], but the updated guidelines recommend a comprehensive metabolic panel and a complete blood count at least annually for all bariatric surgery patients. Thus, all of these tests were evaluated.

The guidelines provide recommendations for screening in the first year after surgery and after the first postoperative year. Thus, we report results separately for the first year and for all subsequent years. We eliminated 1519 patients who had a CPT code for a surgical revision but who had their original procedure before they were tracked in the database (thus, we could not know how far out these patients were from their original operation). If a patient had CPT codes in both categories while in the database (e.g., gastric banding, followed 18 months later by gastric bypass), we counted that individual as contributing person-months to both groups. The final sample size for analysis was 8495, of whom 5907 had gastric bypass, 2526 had gastric banding, and 62 contributed person-months to both groups. Testing frequencies were skewed, so we report frequency distributions for each lab test. We conducted Cochrane-Mantel-Haenszel testing to assess for statistical significance of differences in testing frequency.

Results

First-line tests

Tables 1 and 2 display testing frequency for first-line tests among patients undergoing gastric bypass. Table 1 shows testing frequency in the first postoperative year, and Table 2 shows testing frequency after the first postoperative year. With the exception of testing for diabetes, most patients in both groups (gastric bypass and gastric banding) did not have lab tests done in a given year during the observation period, whether in the first postoperative year or after the first year. A significantly greater percentage of gastric bypass patients had at least 1 test per year, compared with gastric banding groups, with slightly greater differences for tests of micronutrient deficiency (vitamin B12, iron, vitamin D, zinc) than for chemistry panels (basic metabolic panel, liver panel), complete blood count, and testing for diabetes.

Second-line tests

Tables 3 and 4 display testing frequency for second-line tests; Table 3 shows the first postoperative year, and Table 4 shows results after the first year. Again, a significantly greater percentage of gastric bypass patients than gastric banding patients had at least 1 test done during the observation period. However, only a small percentage of patients in both groups underwent testing for these deficiencies. The exception was folate, for which the testing frequency more closely resembled that of the first-line tests.