

Prevalence of Irritable Bowel Syndrome in Morbidly Obese Individuals Seeking Bariatric Surgery

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ABSTRACT

AIM: An increased prevalence of irritable bowel syndrome has been reported in obese individuals. Factors important in weight loss after bariatric surgery are incompletely understood, and small intestinal bacterial overgrowth in individuals with type 2 diabetes mellitus is a potential risk factor. Our aims are to examine whether the increased

prevalence of irritable bowel syndrome in obese individuals seeking bariatric surgery is associated with diabetes mellitus and whether weight loss after bariatric surgery is altered by irritable bowel syndrome.

METHODS: This is a single-center, retrospective study performed in a large, urban community teaching hospital. Individuals seen in gastrointestinal bariatric clinic prior to bariatric surgery from 2010 to 2013 completed a Manning symptom criteria questionnaire prior to their medical evaluation; ≥ 3 Manning criteria is accepted as diagnostic of irritable bowel syndrome. Percent excess weight loss at 6-, 12-, and 24-months after bariatric surgery is recorded.

RESULTS: Thirty percent of 278 individuals seeking bariatric surgery have ≥ 3 Manning criteria. There is no relationship between type 2 diabetes mellitus and the presence of ≥ 3 Manning criteria ($p > 0.05$), nor is body mass index a significant risk factor for irritable bowel syndrome ($p > 0.05$). At 6-, 12-, and 24-months after Roux-en-Y gastric bypass or vertical sleeve gastrectomy, there is no difference in percent excess weight loss in individuals with ≥ 3 Manning criteria compared to individuals with ≤ 2 Manning criteria (for both surgical procedures: $p > 0.05$).

CONCLUSION: A diagnosis of diabetes mellitus or body mass index do not explain the high prevalence of irritable bowel syndrome identified in individuals with obesity seeking bariatric surgery, and irritable bowel syndrome does not alter weight loss after bariatric surgery.

Key words: Morbid obesity; Bariatrics; Bariatric surgery; Irritable bowel syndrome; Diabetes mellitus

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INTRODUCTION

The high prevalence of obesity is a major national and international medical risk factor and a recent international study of 195 countries

reported that the prevalence of obesity has doubled since 1980 in more than 70 countries^[1]. Bariatric surgery can be effective surgical therapy for individuals with medically-complicated obesity. However, gastrointestinal symptoms remain common complaints in individuals after bariatric surgery^[2].

As a potential explanation for gastrointestinal symptoms, a recent comprehensive review reported that in different study populations, the prevalence of irritable bowel syndrome (IBS) in obese subjects ranged from 11.6% to 24%^[3]. The author suggested that further studies were needed to examine the association between obesity and IBS. In an original study reported by Manning and associates^[4], four symptoms were significantly more common among individuals with IBS (distension, relief of abdominal pain with a bowel movement, looser bowel movements with the onset of abdominal pain, and more frequent bowel movements with the onset of abdominal pain), while passage of mucus and a sensation of incomplete evacuation were also more common in individuals with IBS. In a study of patients who initially presented with three or more Manning symptom criteria, follow up clinical evaluation completed 10 to 13 years later revealed that a large majority of patients did not consider their symptoms resolved^[5], supporting the notion that a diagnosis of IBS based upon clinical criteria is durable.

Multiple validation studies examining the Manning clinical criteria have been reported. In a study of 172 outpatients with gastrointestinal complaints in South Korea, if there were ≥ 3 Manning symptom criteria, the apparent sensitivity with regards to IBS was 67% and the apparent specificity was 70%^[6]. Talley and associates examined the 6 Manning symptom criteria in 395 consecutive patients seen at the Mayo Clinic for gastrointestinal complaints^[7]. Among 145 healthy controls, 7% had ≥ 3 Manning symptom criteria while 53% of 82 individuals with IBS had ≥ 3 Manning symptom criteria^[7]. In a study of 123 patients in India, ≥ 3 Manning symptom criteria provided an apparent sensitivity of 66.1% in discriminating IBS^[8], and upon comparing individuals with IBS to healthy controls, a finding of ≥ 3 Manning symptom criteria provided an apparent specificity of 93.3%^[8].

Factors important in weight loss after bariatric surgery are incompletely understood^[9-11]. Potential factors likely include a combination of restriction of food intake, malabsorption, postoperative dumping syndrome, altered release of both anorectic hormones (i.e. peptide YY) as well as orexigenic hormones (i.e. ghrelin), and the development of small intestinal bacterial overgrowth (SIBO). Older studies suggested that diabetic patients with concurrent malabsorption were likely to have an underlying diagnosis of SIBO^[12]. More recently, it has been reported that SIBO is more likely to be diagnosed in individuals with IBS or in individuals with type 2 diabetes mellitus^[13]. The potential importance of this finding is supported by the high apparent prevalence (52%) of SIBO in individuals seen for evaluation of gastrointestinal symptoms after Roux-en-Y gastric bypass^[14].

Based upon these prior studies, our hypotheses are that the increased prevalence of IBS in individuals with obesity seeking bariatric surgery is associated with diabetes mellitus and that weight loss after bariatric surgery is altered by the presence of IBS. The specific aims of this study are to examine Manning symptom criteria in morbidly obese individuals seen prior to bariatric surgery, and to then examine excess weight loss at 6-, 12-, and 24-months after Roux-en-Y gastric bypass and after vertical sleeve gastrectomy in those individuals.

METHODS

Participants

Approval for human studies was obtained from the MedStar

Research Institute (Hyattsville, MD) Human Studies Subcommittee on January 25, 2015. Because the Human Studies Subcommittee decided that this was a minimal risk protocol, they granted a waiver of informed consent for this research study. This is a single institution, retrospective study performed in a large, urban community teaching hospital. This study includes 278 patients who underwent pre-operative evaluation in our Bariatric Gastrointestinal Clinic from 2010 to 2013. Inclusion criteria included individuals who were age 18 or above, had a normal thyroid stimulating hormone level, had a body mass index > 34.9 kg/m², and self-completed a symptom questionnaire. Exclusion criteria included a known diagnosis of Celiac disease, inflammatory bowel disease, or peptic ulcer disease. Before beginning their gastrointestinal medical visit, each patient was given a symptom questionnaire to self-complete that contained yes or no responses to the six Manning symptom criteria: abdomen discomfort that is better after a bowel movement; abdomen discomfort that starts with constipation or diarrhea; abdomen discomfort that starts with a hard or a loose, watery bowel movement; feeling that the bowel movement did not completely empty out; mucus or whitish streaks in bowel movements; and feeling that the abdomen or stomach is visibly bloated or distended^[4,7]. The questionnaires were then scanned into each patient's electronic medical record. Each patient had an upper endoscopy prior to bariatric surgery. Subjects then underwent vertical sleeve gastrectomy ($n = 128$), Roux-en-Y gastric bypass surgery ($n = 96$), or placement of an adjustable gastric band ($n = 54$).

Data Collection

Patient charts were reviewed using the available electronic medical records. We recorded the number of Manning symptom criteria, patient's age, sex, ethnic background, body mass index (kg/m²), and history of preoperative type 2 diabetes mellitus. Manning symptom criteria of 3 or greater is accepted in this study as consistent with a diagnosis of IBS.

One hundred and eight consecutive postoperative patients (56 individuals after Roux-en-Y gastric bypass surgery and 52 individuals after vertical sleeve gastrectomy) underwent further chart review. Their preoperative height and weight and their weight 6-, 12- and 24-months postoperatively were recorded for each individual. Each individual's ideal body weight was determined from their height and sex. Preoperative excess weight was determined by subtracting the individual's ideal body weight from their preoperative weight. Percent excess weight loss was determined by: (1) subtracting the individual's postoperative weight from their preoperative weight; (2) dividing that number by their preoperative excess weight; and then (3) multiplying by 100.

Statistical Analysis

Statistical analysis was performed as follows. For the continuous variables differences in the averages between two groups were tested by two sample t-test when normality assumption was satisfied. Chi-square statistic was used to examine potential dependence of Manning symptom criteria and type 2 diabetes mellitus. A p -value < 0.05 was accepted as a statistically significant difference.

RESULTS

Patient Demographics

As shown in Table 1, the mean age of the 278 subjects is 45.8 years-old. This is a predominantly female (81%) population of Black Americans (74%). Preoperative type 2 diabetes mellitus is present in 35% of subjects.

Diagnosis of Irritable Bowel Syndrome

As shown in Figure 1, 83 individuals (30%) have ≥ 3 Manning symptom criteria, consistent with a diagnosis of IBS. These individuals with ≥ 3 Manning symptom criteria include 32% of all of the women and 22% of all of the men.

Associations with Irritable Bowel Syndrome

As shown in Table 2, the Chi-square statistic examining potential dependence of Manning symptom criteria and type 2 diabetes mellitus is not statistically significant ($p = 0.31$). In further evaluation, the body mass indexes of 195 individuals with ≤ 2 Manning symptom criteria (Mean: 48.7 kg/m² with SD of 9) are not significantly different (t-test: $p = 0.53$) compared to 83 individuals with ≥ 3 Manning symptom criteria (Mean: 49.5 kg/m² with SD of 10).

Irritable Bowel Syndrome and Percent Excess Weight Loss

In 56 individuals after Roux-en-Y gastric bypass surgery, there is no significant difference (t-tests: $p > 0.05$) in percent excess weight loss at 6 months, 12 months, and 24 months postoperatively in individuals with ≤ 2 Manning symptom criteria compared to individuals with ≥ 3 Manning symptom criteria (Figure 2).

In 52 individuals after vertical sleeve gastrectomy, there is no significant difference (t-tests: $p > 0.05$) in percent excess weight loss at 6 months, 12 months, and 24 months postoperatively in individuals with ≤ 2 Manning symptom criteria compared to individuals with ≥ 3 Manning symptom criteria (Figure 3).

DISCUSSION

The finding of ≥ 3 Manning symptom criteria in 30% of morbidly obese individuals seeking bariatric surgery confirms the high prevalence of IBS in this patient population. One prior study of 100 candidates for bariatric surgery reported a 30% prevalence of IBS, but the clinical diagnosis of IBS was based upon the use of Rome-III criteria^[15]. Our present study did not find evidence to support an association between type 2 diabetes mellitus and IBS. There was no difference in mean body mass index in individuals with ≤ 2 Manning symptom criteria compared to the mean body mass index in individuals with ≥ 3 Manning symptom criteria. There was therefore no evidence that individuals with higher body mass index were more likely to have IBS. Finally, in a study of percent excess weight loss postoperatively after Roux-en-Y gastric bypass surgery and after vertical sleeve gastrectomy, there was no difference identified in individuals with ≤ 2 Manning symptom criteria compared to individuals with ≥ 3 Manning symptom criteria. There was therefore no evidence that IBS altered weight loss after either Roux-en-Y gastric bypass surgery or vertical sleeve gastrectomy.

The Manning symptom criteria were chosen in this study as clinical criteria for the diagnosis of IBS because of the focus in the Manning criteria on symptoms of bowel disturbance, rather than chronic abdominal pain. However, our hypothesis that bowel disturbance, as judged by ≥ 3 Manning symptom criteria, alters weight loss after bariatric surgery is not supported by this study, and this finding was somewhat surprising. Three or more Manning symptom criteria were chosen in this study for a diagnosis of IBS based on prior population studies. In a study of 1021 residents of Olmsted County, Minnesota, 12.8% of respondents had ≥ 3 Manning symptom criteria^[16]. In a study from Spain, 2000 individuals were randomly selected from the general population^[17], and the prevalence of IBS based on ≥ 3 Manning symptom criteria was reported to be 10.3%. These

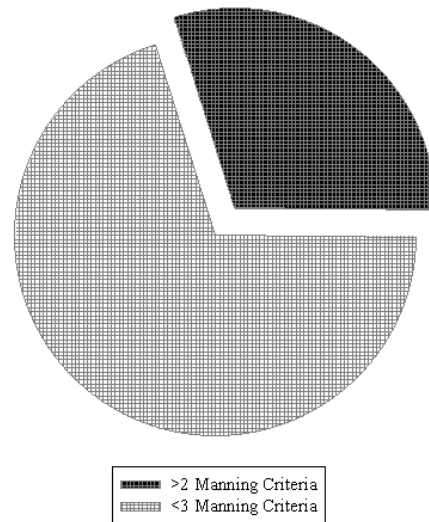


Figure 1 Thirty percent of patients seeking bariatric surgery have ≥ 3 Manning criteria supporting a diagnosis of irritable bowel syndrome.

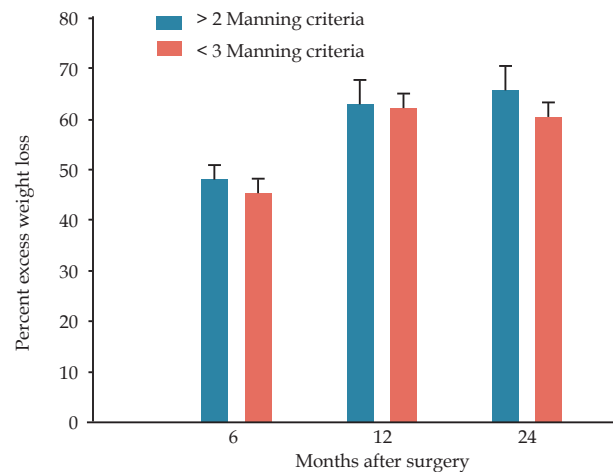


Figure 2 There were no significant differences (t-tests: $p > 0.05$) in percent excess weight loss in individuals having ≥ 3 Manning criteria compared to individuals with ≤ 2 Manning criteria at 6 months, 12 months, or 24 months after Roux-en-Y gastric bypass surgery.

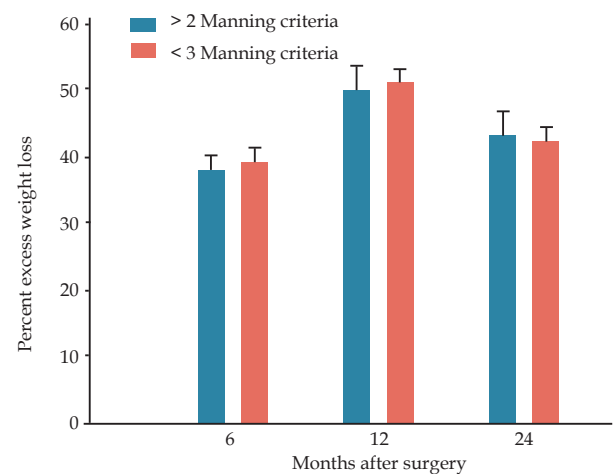


Figure 3 There were no significant differences (t-tests: $p > 0.05$) in percent excess weight loss in individuals having ≥ 3 Manning criteria compared to individuals with ≤ 2 Manning criteria at 6 months, 12 months, or 24 months after vertical sleeve gastrectomy.

Table 1 Demographics of the study subjects.

Patients (n)	278
Age (in years)	
Mean (SD)	45.8 (\pm 10)
Range	21 to 73
Gender	
Men	52 (19%)
Women	226 (81%)
Body Mass Index (kg/m ²)	
Range	35 to 91
Race	
Black Americans	206 (74%)
White Americans	70 (25%)
Asian Americans	2 (1%)
Type 2 Diabetes mellitus	98 (35%)

Table 2 chi-square statistic to examine dependence of Manning symptom criteria and type 2 diabetes mellitus.

	≤ 2 Manning	≥ 3 Manning	Totals
	Criteria	Criteria	
No Diabetes Mellitus	130	50	180
Diabetes Mellitus	65	33	98
Totals	195	83	$p = 0.31$

findings are in contrast to our present results demonstrating that 30% of morbidly obese individuals seeking bariatric surgery have ≥ 3 Manning symptom criteria.

Our present study did not identify an association between IBS and either type 2 diabetes mellitus or body mass index. Therefore, potential mechanisms for an increased prevalence of IBS in morbidly obese individuals seeking bariatric surgery require further investigation. It has been previously suggested that visceral abdominal obesity is a risk factor for IBS^[18]. In that study, the reported prevalence of IBS was 19.9% by the use of Rome-III criteria^[18]. However, the mean body mass index in those subjects with IBS was only 25.65 kg/m² (note that a normal weight is a body mass index of 18.5 to 24.9 kg/m²). If visceral abdominal obesity is a major risk factor for IBS, it would seem very likely that individuals with high body mass index should have a higher prevalence of IBS.

Limitations of this present study include the high percentage of study subjects who were black women. It is therefore not known whether the results of this study can be generalized to other patient demographic groups. In a prior population-based study examining Manning symptom criteria in England, an increased prevalence of IBS in women compared to men has been reported^[19]. Therefore, the presence of a large percentage of women in this present study may have increased the overall prevalence of IBS in this study. It is also not known whether morbidly obese individuals with chronic abdominal symptoms are more likely to seek bariatric surgery. In addition, this was a retrospective study and not a prospective study, and therefore the limitations of a retrospective study should be considered.

This study does support reassuring morbidly obese individuals that the presence of IBS should not alter their weight loss after Roux-en-Y gastric bypass surgery or after vertical sleeve gastrectomy. Our results do suggest that gastroenterologists who see patients after bariatric surgery for the evaluation and treatment of gastrointestinal symptoms should consider the possibility of an ongoing diagnosis of IBS.

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