Using Lifestyle Medicine in U.S. Health Care to Treat Obesity: Too Many Bariatric Surgeries?

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Abstract

More than one-third of Americans are classified as obese. Many clinicians perform bariatric surgery (BSx) when it is said that lifestyle intervention failed. However, BSx is medically complex, with extremely variable success, certain failures, major complications, and sometimes death. Although many studies declare BSx as more effective for producing weight loss than nonsurgical lifestyle management, these conclusions are flawed when lifestyle management between cohorts are not identical. Lifestyle behavior change is essential to success for both surgical and nonsurgical weight loss, as over 50% of BSx patients regain weight without lifestyle modification. Indeed, programs that include self-reward and reinforcement are extremely effective. It is therefore possible that successful BSx is simply an intrinsic reward for an intensive change in lifestyle behavior. Accounting for the costs and risks associated with BSx, providing state and federal resources for lifestyle behavior change programs could provide a key opportunity for the war against obesity.

Introduction

Obesity is a significant public health concern for the nation (28,40), as more than one-third of Americans now are classified as obese (34). In November 2013, the American Heart Association, American College of Cardiology, and The Obesity Society declared obesity as a disease and underscored the disease's key role in death from heart disease and stroke, the nation's first and fourth killers, respectively (27). The burden on the U.S. health care system is crushing, as obesity and associated comorbidities are estimated to cost $147 billion annually (19).

The first line of obesity treatment is usually lifestyle management that includes diet, exercise, and, depending on the physician, cognitive-behavioral therapy (26,27,31). Many clinicians perform bariatric surgery (BSx) when it is said that lifestyle intervention failed to decrease weight and improve metabolic health (45). A greater number of BSx are being performed each year in the United States, with the most current estimates (from 2013) at 179,000 procedures annually (2). However, BSx is a medically complex intervention, with great success observed, some failures, and, most notably, major adverse events (some necessitating reoperation) that include anastomosis leakage, pneumonia, pulmonary embolism, band slippage, and band erosion (36). Early and long-term complications also occur, such as abdominal hernias, development of gallstones, dumping syndrome, and nutritional deficiencies that can lead to anemia, osteoporosis, and hair loss (12,21,46). The Cleveland Clinic Bariatric and Metabolic Institute publishes a comprehensive list of risks and complications that highlight 42 risks that accompany gastric bypass and gastric banding surgery, with death listed as one of those risks (12). Epidemiologic evidence from 13,273 patients still suggests that although BSx has become a safer procedure and postoperative mortality has declined (18), risk of death (1 in 50 in the first 30 d) remains significantly increased compared with lifestyle management alone (9).

Even without complications, weight loss response following BSx is extremely variable. Manning et al. (30) demonstrated that in 1,456 adults who underwent either Roux-en-Y gastric bypass (RYGBP) (n = 918) or sleeve gastrectomy (SG) (n = 538), maximal percentage of weight loss following RYGBP ranged from 4.1% to 60.9% and SG ranged from 1.1% to 58.3%. A 2008 meta-analysis found that 64% of patients who underwent BSx had weight regain within 48 months (29). Many researchers have attributed this large variability in weight loss to different preoperative psychological, eating behavior, or quality-of-life factors (33). Indeed, Miras et al. (33) found that weight loss after BSx in 90 patients was predicted by preoperative scores of dietary restraint, disinhibition, and presurgery energy levels. Coleman and Brookey (14) found that percent excess weight loss 1 year after RYGB was related to greater diet soda intake and percentage of initial weight lost was related

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to greater water intake, independent of presurgery health status and lifestyle behaviors. The question then begs to be answered: *which is more important for weight loss success, the physical surgery or the lifestyle modification needed for successful BSx outcomes?*

Are the Randomized Controlled Trials That Compare BSx with Lifestyle Management a Fair Comparison?

A number of studies demonstrate that BSx is more effective in producing weight loss, improving metabolic regulation, decreasing glycolated hemoglobin, and reducing waist circumference and cardiometabolic risk factors compared with nonsurgical lifestyle management alone (20,22). However, when the methods of comparison between BSx and lifestyle management in patients experiencing obesity are critiqued closely, many times the pre- and postsurgery psychological, exercise, and diet modifications required to undergo the surgery in the bariatric group are not equivalent between groups, producing flawed conclusions between surgical and nonsurgical intervention outcomes. In May 2013, the National Institutes of Health (NIH) convened a symposium (sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases and the National Heart, Lung, and Blood Institute (NIDDK/NHLBI)) to summarize the current state of knowledge of BSx and review long-term outcomes (15). Although the NIDDK/NHLBI summary stated that available evidence "clearly shows that bariatric surgical procedures result in greater weight loss than nonsurgical treatment," they also admitted that the randomized controlled trials (RCT) conducted, including 7 funded by the NIH that encompass 450 randomized patients, were not comparable because the control group treatments (that included lifestyle behavior change) were not uniform (15). In addition, of the five published high-level RCT comparing BSx with nonsurgical treatment of obesity and Type 2 diabetes, none of the RCT had lifestyle management behavior programs for the nonsurgical cohort that were as identically intensive as they were for the surgical group participants. In fact, when searching the literature, no RCT could be found that had presurgery treatments in the control group that were as stringent or intensively managed as the treatments for the BSx groups. For example, although Sjöström et al. (43) report in their conclusions that BSx appears to be a more effective option than lifestyle management for the treatment of severe obesity (resulting in long-term weight loss and improved lifestyle), they also admit that *no attempt was made to standardize the intervention* in the nonsurgical treatment, which "ranged from sophisticated lifestyle intervention and behavior modification to, in some practices, no treatment whatsoever." Mingrone et al. (32) had no report on the specific procedures or how extensive and systematic the cognitive-behavioral therapy or the diet therapy was before treatment. Therefore without identical lifestyle modification interventions for both surgical and nonsurgical cohorts, conclusions stating that BSx is superior to lifestyle management for weight loss and improved metabolic outcomes cannot be made. In fact, lifestyle management behavior changes are essential to weight loss success and improved metabolic health.

Behavior Change Is Essential to Weight Loss Success

It is important to note that if patients feel they could be successful in their weight loss and disease management, they actually would prefer to adopt a lifestyle management technique over BSx . Arterburn et al. (4) identified 277 adult BSx candidates with a body mass index between 30 and 45 $kg \cdot m^{-2}$ who completed a shared decision making process questionnaire regarding preference for BSx or lifestyle management. Interestingly, most candidates preferred diet and exercise treatment (53.8%) over surgery (8%), with the remaining preferring pharmacotherapy (2%), none of the choices (3%), or were unsure (34%) (4). However, if a patient does decide to take the surgical route, best practices indicate that behavior change is essential for successful surgical outcomes (24,31) as well as to prevent untimely death after surgery (13,24,31). Indeed, the Cleveland Clinic Bariatric and Metabolic Institute's guide on *Weight Loss Surgery and Behavioral Health* states the following regarding behavior change (13):

1) *It is necessary to make a number of permanent lifestyle changes. You will need to permanently change your behaviors, eating habits, and activity patterns.*
2) *Though weight loss surgery physically reduces the size of your stomach, it will not prevent you from eventually gaining back weight if you do not learn how to reduce the amount of food you eat and increase your physical activity to promote calorie burning.*
3) *Individuals who use eating to cope with negative emotions or stress are most successful after surgery if they have learned to replace eating with more adaptive coping strategies such as deep breathing, exercise, or developing a hobby.*
4) *As you take personal responsibility for making permanent lifestyle changes to create a healthier you, psychotherapy is able to provide you with:*
    - *Ongoing support and information about how our thoughts and beliefs can impact our ability to make changes in our eating and exercise patterns.*
    - *Identification and treatment of potential problem areas such as depression, anxiety, or binge eating.*
    - *The development of specific plans for how to cope with problem areas or stresses that can impede your ability to lose weight and maintain a healthier weight.*

The Cleveland Clinic program is a model for successful BSx through lifestyle behavior change, and their detailed guidelines underscore the essential need for behavior change regardless of surgery.

Behavior change programs, when executed well and driven by acknowledged behavior change theories, can be extremely effective (3,5,23,35,37,47). Multiple theories and models of behavior change exist, and many share similar constructs. For example, self-efficacy, as defined by Bandura (7) as the ability to believe that one can achieve one's goals, is ubiquitous in the health behavior change models (1,6,7,38,39,42). Additionally, a key concept found in many behavior change theories is the aspect of rewards or reinforcement for positive behavior change (7,38,39,41). Interestingly, review of the literature indicates that external incentives such as financial rewards do not influence long-term behavior change (25,44).

However, self-reward and reinforcement are effective components of behavior change (3,7,10,16,41,42,48). Rewards are utilized when goals are met to give the individual incentive and toward achieving the goal. Therefore, achieving success of goals due to self-reward and reinforcement begs the overarching question, *do successful BSx outcomes after lifestyle modification serve and/or function as a reward to successful behavior change?*

Are Successful Gastric Bypass Surgery Outcomes Simply a Reward for Lifestyle Behavior Change?

Without lifestyle behavior change, failure of BSx is likely. A meta-analysis by Magro et al. (29) found that 64% of patients who underwent BSx had weight regain within 48 months, of which 60% of patients never underwent nutritional follow-up and 80% never underwent psychological follow-up. On the contrary, successful long-term, non-surgical weight loss and maintenance is associated with having a physically active lifestyle, a regular meal rhythm including breakfast and healthier eating, control of overeating, social support, better coping strategies, and ability to handle life stress, self-efficacy, and overall more psychological strength and stability (17). Therefore lifestyle behavior change (physical activity, nutrition, self-care, and coping strategies) that occurs before surgery and is maintained postoperatively will contribute to the optimization of bariatric surgical outcomes (8). Bond et al. (8) demonstrated that patients who underwent physical activity behavior change therapy *before surgery* significantly increased their daily minutes of physical activity by 27% compared with no change in physical activity in patients who underwent standard presurgical care. Alternatively Chapman et al. (11) demonstrated that if behavior change is not supported, postoperative participants will spend >70% of their time in sedentary behavior with very little time (5%) spent in moderate or vigorous physical activity. Consequently early targeting of poor responders with more intensive pre- and postoperative lifestyle and behavioral support enhances weight loss response (30). The take-home message then is that lifestyle behavior change programs are essential for weight loss and can help intervene in the disease process, regardless of whether the candidate follows through with a surgical procedure. If this is the case, it is possible that successful BSx for weight loss and improvement in metabolic health is simply an intrinsic reward for an intensive change in lifestyle behavior, albeit an expensive one. The NIDDK reports that the cost of BSx can range from $20,000 to $25,000 for the surgery alone (not including additional hospital and anesthesiologist's fees).

Conclusions

More than 50% of patients who do not undergo lifestyle behavior change experience long-term weight regain after surgery. Since obesity and associated comorbidities cost the United States $147 billion annually, state and federal efforts should be made to invest these dollars instead into intensive and comprehensive lifestyle management programs that include resources for qualified psychological assessment, staff-based coaching, group-based physical activity, and nutrition programs and psychological counseling, in-person and telephonic support with case managers, and outcome-based research (19). Summing up the costs, risks, and even deaths associated with BSx, along with patient's first preference to adopt a lifestyle management technique over BSx if it could be successful, it is likely that lifestyle management could be as successful as or even more so than BSx alone if given the opportunity. To understand truly the effects of BSx versus lifestyle behavior changes as an intervention, well-designed randomized controlled trials are needed. Providing state and federal resources for lifestyle behavior change could provide our nation a tangible opportunity for better long-term health outcomes and decreased health care costs in the war against obesity.

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