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Bariatric Surgery to Treat Obesity Among Adults

Nazer Raef Waleed M [1] , Yazid Ali M Algadhi [2] , Saeed Awdah Assiri [3] , Mashail Ali Alomari [2] , Osama Talaat Khouj [4] , Meaad Yassin Albakestani [1] , Doha Taha Abafallata [1] , Muath Abdullah Aloufi [5] , Mosab Abed F Alsobhi [6] , Nahlah ali alsubhi [7] , Nasser Mubarak S Alshahrani [2] , Mohammed Sadan M. Alzahrani [8] , Eman Ahmad H. Alabdrabalrasol [9] , Sajedah Hassan Almshikhess [10] , Turki Rashid A Alsudairi [11]

1- Batterjee Medical College, 2-King Khalid University, 3-Al-Baha University, 4-King Abdul Aziz University Hospital, 5-University of Tabuk,6-King Abdulaziz University, 7-Ibn Sina National College, 8-Alsulimaniah Phcc-Jeddah's East General Hospital, 9- Imam Abdulrahman Bin Faisal University, 10- Umm Alqura University, 11- King Faisal University

ABSTRACT

Background: Bariatric surgery is one of the few effective treatments for morbid obesity, yet little information about weight outcomes after surgery in this demographic are available. We determined the effectiveness of bariatric surgery in reducing weight and body mass index (BMI) in adults.

Materials and Methods: Adults from 18 to 30 years old who had undertaken gastric bypass or adjustable gastric band surgery between May 2013 and November 2016 and who had complete follow-up data available were included in the present analysis. Mean weight and BMI before and one year after surgery were compared.

Results: Among 35 adults, Mean BMI and weight, and z-scores and percentile transformations were all significantly lower after surgery for the entire sample ($P < 0.001$). Gastric bypass surgery presented significantly better weight loss outcomes for all anthropometric measures versus adjustable gastric band surgery ($P < 0.05$). No perioperative complications were reported. Two patients who stopped taking supplements as prescribed experienced iron-deficiency anaemia within the year following surgery.

Conclusions: Our results show that bariatric surgery can markedly reduce weight among a predominantly adult patients sample, and gastric bypass procedure in particular. These findings indicate that bariatric surgery has the potential to be safe and effective in substantially reducing weight in a group of adults who are at particularly high risk for obesity-related health consequences.

Keywords: Overweight, Treatment, Bariatric Surgery, Metabolic Syndrome, Adults.

INTRODUCTION

Obesity is a major health problem worldwide and has reached an epidemic proportion in the society. Indication continues to accumulate that obesity is a major risk factor for many diseases and is related with significant morbidity and mortality.

The Centres for Disease Control and Prevention (CDC) lately described that the pervasiveness of childhood obesity has become stable over the past few years, while it remains high among all age, sex, and ethnic groups. However, an estimated 12% of all US children amongst 2 and 19 years old fall in the category of morbid obesity (a body mass index [BMI] ≥97th percentile for age and gender). Furthermore, noteworthy differences in obesity pervasiveness by race/ethnicity were distinguished. The authors similarly found that there was a substantial increase in BMI between adult's ages 12 through 19 years from 1999–2000 to 2009–2010 [1]. Considering other factors (e.g., total muscle mass, waist circumference) besides the BMI may be important. Such as, an extremely muscular individual may have an elevated BMI without being considered overweight. Waist circumference has been shown to be an excellent indicator of abdominal fat mass. A circumference of greater than 88 cm (35 in.) in women or more than 102 cm (40 in.) in men strongly correlates with an increased risk of obesity-related disease.

Obesity is a complex, multifactorial chronic disease influenced by the interaction of several factors, such as genetic, endocrine, metabolic, environmental (social and cultural), behavioural, and psychological components. The basic mechanism involves energy intake that exceeds energy output. Youthful start obesity has several short and long-term health related concerns, comprising dyslipidaemia, hypertension, glucose intolerance, and insulin resistance, which include the metabolic syndrome [2, 3]. Consecutively, these conditions are risk elements for type 2 diabetes and cardiovascular disease in both childhood and adults [4, 5, 6]. Infancy overweight has also been connected with orthopaedic complications [7], non-alcoholic fatty liver disease [8], polycystic ovarian syndrome [9], in addition to anxiety and depression [10]. The majority of these health problems similarly have a tendency to continue into adulthood [5, 6]. Ethnic

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minorities are suspiciously affected by virtually all of these conditions, and diabetes and cardiovascular disease in specific.

Lately, bariatric surgery has turned out to be progressively acknowledged as a compelling technique to determine a large number of these comorbidities and is thought to be sensible choice when different strategies for weight reduction failure [11, 12]. Present investigations recommend that neither pharmacological nor dietary management can keep up long haul weight reduction in fat adults as adequately as can bariatric surgery [12, 13]. Bariatric surgery is currently acknowledged for adults as the treatment of decision for recalcitrant morbid obesity.

METHODS

We studied the medical records of all adults' ages 18 to 30 years who underwent bariatric surgery at **Abdul Aziz University** Hospital or care centre between May 2013 and November 2016. Patients were only involved in this analysis if they had post-surgery anthropometric data available to ensure a complete follow-up rate. A medical complication was well-defined by the surgical program as any event which required an intervention, a readmission, an increase in the hospital stay, or an emergency department visit within 30 days. This review included the surgeon's clinic records in addition to a review of the hospital's computer system for ER visits and readmission.

Data were collected on demographic, pre-surgical height and weight, BMI and pre-operative complications. Follow-up weight data were collected between 10 and 12 months after surgery. Height and weight were measured amid routine clinical visits. Weight was measured to the closest 0.045 kilograms utilizing an advanced scale with members wearing light dress and no shoes. Stature was measured to the closest 0.5 cm utilizing a divider mounted stadiometer. CDC weight orders for youth utilizing BMI (characterized as weight/height) percentiles ranges; underweight (<5th), ordinary weight (≥5th to <85th), overweight (≥85th to <95th) corpulent (≥95th), and excessively fat (≥97th) [1, 14]. As in adults, BMI is a flawed pointer of adiposity in kids. Notwithstanding, in light of the fact that BMI is nonlinear in kids, BMI percentiles and z-scores are utilized to assess weight and anthropometric change and were along these lines incorporated into this investigation as the essential results [20].

All patients were dealt with at a high-volume multidisciplinary bariatric program supervised by a grown-up bariatric specialist (who performs between 250 – 400 bariatric strategies every year). Every chose understanding met the National Institutes of Health criteria for bariatric surgery [16, 17]. Thusly, all had either a BMI more noteworthy than 35 kg/m2 with no less than one co-bleakness (e.g., lifted circulatory strain, hypercholesterolemia) or a BMI more noteworthy than 40 kg/m2. Baseline differences in all demographic variables and BMI were compared via chi-square for categorical variables and t-test for continuous variables. Statistical tests resulting in a probability of 0.05 or less were considered statistically significant. All data met the assumptions of the tests used to analyse them.

RESULTS

A total of 35 adults' experienced bariatric surgery in the defined timeframe and had presented information at the one year interval after surgery. The majority of the sample was Women (77.1%) and underwent gastric bypass surgery (91.4%) versus adjustable gastric band (8.6%). Mean (SD) age at surgery was 23.5 (1.06) years (Table 1).

Table 1: Characteristics of adults experienced Bariatric Surgery.

Characteristic	All		Men		Women	
	N	%	N	%	N	%
Sample size	35	100	8	22.9%	27	77.1%
Gastric bypass	32	91.4%	7	21.9%	25	78.1%
Adjustable gastric band	3	8.6%	1	33.3%	2	66.7%
Age, mean (SD), years	23.5 (1.06)		24.1 (0.96)		22.8 (1.1)	

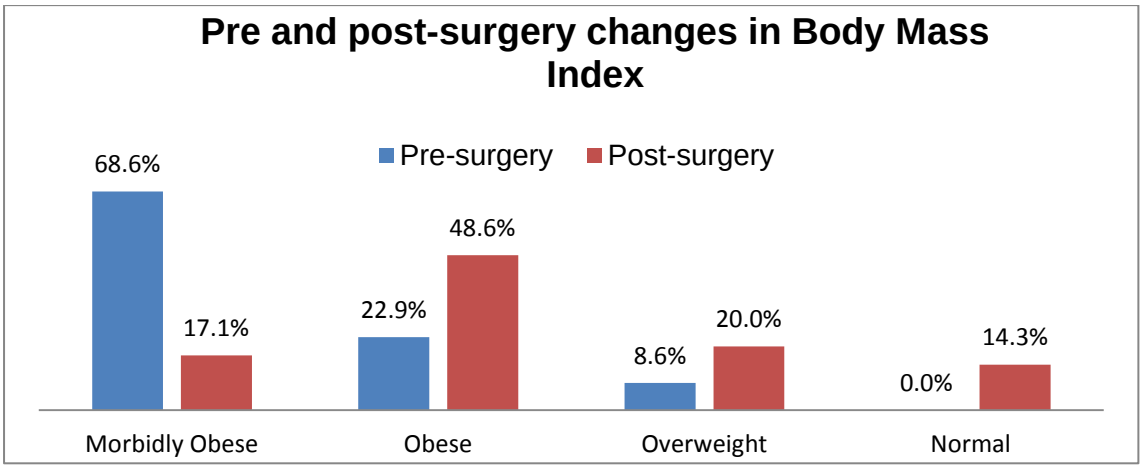

Figure 1: Pre and post-surgery changes in Body Mass Index

Mean BMI and weight along with z-scores and percentile transformations were all significantly lower after surgery for the entire sample P<0.001. Generally, Women and men BMI loss was very comparable 1 year after surgery (11.2 kg/m2 and 10.3 kg/m2, respectively); BMI was reduced from 48.4 kg/m2 to 38.1 kg/m2 among men and from 44.8 kg/m2 to 33.6 kg/m2 among women (Table 2).

Table 2: Pre and post-surgery differences

	Body Mass Index (kg/m^2)		**Body Mass Index z-score**		**Body Mass Index percentile**	
Measure	Pre	Post	Pre	Post	Pre	Post
	Mean(SE)	Mean(SE)	Mean(SE)	Mean(SE)	Mean(SE)	Mean(SE)
	(N = 35)	(N = 35)	(N = 35)	(N = 35)	(N = 35)	(N = 35)
Men	48.4(1.6)	38.1(2.3)	3(0.8)	2.2(0.2)	99.7(0.1)	94.6(3.5)
Women	44.8(0.6)	33.6(0.8)	2.5(0.1)	1.9(0.1)	99(0.1)	94.2(1.2)
Gastric Bypass	45.9(0.6)	33.8(0.8)	2.5(0.1)	1.8(0.1)	99.3(0.1)	94.1(1.3)
Lap Band	44.9(2.9)	40.2(3.6)	2.6(0.1)	2.3(0.2)	99.3(0.2)	97.8(1.0)

When pre-post anthropometric measures were compared by type of surgery, gastric bypass surgery showed significantly better weight loss results for all anthropometric measures versus adjustable gastric band surgery (P<0.05). The mean BMI loss among those who experienced gastric bypass surgery was almost 3 times that of those who underwent adjustable gastric band procedure (12.1 kg/m^2 versus 4.7 kg/m^2) (Table 2). No perioperative complications were stated. There were two minor post-operative complications (nausea and vomiting) that resolved with medical management. Three patients developed iron deficiency anaemia due to poor compliance with supplements.

DISCUSSION

Bariatric surgery delivers significant weight loss with minimum complications between multi-ethnic obese adult. Gastric bypass surgery demonstrates significantly more weight loss results 1 year after surgery versus the adjustable gastric band technique. Generally, 1-year after surgery, the mean BMI between patients who underwent gastric bypass was no longer in the obese range according to their age and gender adjusted percentiles. Complications were few and controllable; a very vital finding given that this is one of the biggest worries of performing bariatric surgery in this particular population of patients. These findings indicate that bariatric surgery has the potential to be safe and effective in considerably decreasing weight in multi-ethnic obese adult, a group that is at mainly high risk for obesity-related health concerns, for example, diabetes and cardiovascular disease [1, 2]. National pervasiveness assessments of morbid obesity (a BMI of ≥40 kg/m^2) between adults keep on increasing [1]. Studies have demonstrated that almost one million young people in the US ages 12-to-19 years of age, or around 4% of the populace in this age, have signs and indications of metabolic disorder, the forerunner to type II diabetes [18, 19]. Among overweight young people, the predominance is about 30% [20, 21].

Indeed, even among kids as youthful as 8-years of age, national commonness evaluations of having no less than one hazard factor for metabolic disorder go from 2% to 9%, utilizing both of two age-, sex-, and ethnicity-balanced definitions, and this predominance was nearly connected with weight [19]. At present, there is no institutionalized clinical convention to treat the metabolic disorder in youth, yet the above investigations obviously record that our country might confront another and more youthful age of sort 2 diabetics and those with cardiovascular infection because of the expanding extent of obese adolescents and adults.

Bariatric surgery is currently the only modality that provides a significant, sustained weight loss for morbidly obese patients, with resultant improvement in obesity-related comorbidities. A prospective, controlled Swedish study involving 4047 obese patients, half of whom had undergone bariatric procedures, followed up over 14.7 years, found that compared to normal care, bariatric surgery was associated with a significantly reduced number of cardiovascular deaths and a lower frequency of cardiovascular events in obese adults [22].

The Swedish Obese Subjects (SOS) study is an on-going, prospective study of 2010 obese participants who experienced bariatric surgery and 2037 obese patients who received usual care in the primary health care system. Compared to the control group, obese adults who underwent surgery experienced a reduced number of cardiovascular deaths and a lower incidence of heart attack and stroke [22, 23]. A 2017 report from the SOS group found that bariatric surgery reduced the long-term incidence of female-specific cancer, particularly endometrial cancer [24]. An Australian study by Keating et al (25) compared the outcomes of weight-loss treatments in patients who had been diagnosed with type 2 diabetes mellitus in class I/II obesity, estimating the lifetime costs and quality-adjusted life-years (QALYs) for individuals who had undergone surgically induced weight loss and for patients who had utilized conventional weight loss treatment [25]. In another study, Keating et al (26) observed the within-trial cost efficacy, over 2 years, of surgical treatment relative to that of conventional therapy for achieving remission in patients recently diagnosed with type 2 diabetes mellitus with class I/II obesity [26]. Trial intervention costs included gastric banding surgery, mitigation of complications, outpatient medical consultations, medical investigations, pathology, weight-loss therapies, and medication.

Unfortunately, systematic reviews of lifestyle programs addressing changes in diet, exercise, and behaviour to encourage weight loss have found mostly poor results [27]. A recent meta-analysis that included 17 randomized controlled trials of lifestyle programs showed that adolescents experienced modest weight reduction for up to 12-months but weight gain afterward. Furthermore, results from behavioural weight management programs, usually targeting those adolescents who are either overweight or obese, have reported poor rates of attendance and suboptimal weight reduction for youth with extreme obesity [28]. For extremely obese adolescents, even after 1 year in a well-designed weight management program, only modest BMI reductions were achieved, and these reductions were particularly less among ethnic minorities.

Our results confirm those of other studies [11,29] showing bariatric surgery to be a safe and effective method to reduce weight and consequent cardiometabolic risk for at least 1 year if other lifestyle-change interventions are not successful. It will be mainly important to examine results beyond 1 year after surgery to determine whether positive changes can be maintained.

In conclusion, our outcomes show that gastric bypass surgery results in much better weight loss results versus the adjustable gastric band procedure parallels findings from larger, national cohort reports [30]. Explicitly, nationally-representative data of 890 patients who underwent bariatric surgery from 2004–2010 showed the overall 1 year mean weight loss for those who underwent gastric bypass surgery was more than twice that of those who underwent adjustable gastric band surgery. Similar results were found for all other anthropometric changes and comparisons over one year between surgery types, as is reported here.

CONCLUSION

On the basis of our outcomes, it is possible to conclude that bariatric surgery can reduce weight and BMI regardless of ethnicity and among Saudi's patient in particular; Complications were few and controllable; a very important finding given that this is one of the biggest concerns of performing bariatric surgery in this exact population of patients; and in a private-practice, high volume adult bariatric program, laparoscopic bariatric surgery can be safely performed in adults.

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