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Psychopathological aspects and quality of life of obese patients after bariatric surgery

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Summary

Obesity is becoming a widespread disease and the latest WHO data show that almost the 30% of the population worldwide is currently overweight or obese. The growing concern about obesity is highlighted by the creation of neologism "globesity" few years ago. Alongside psychological support and the improvement of incorrect behavior (such as fat diet and poor physical activity), the contribution of bariatric surgery has an increasing relevance. Currently there are three major surgical procedures used: sleeve gastrectomy, gastric banding and gastric by-pass. The goal of this study was to evaluate the possible variation of the psychopathological conditions pre and post-intervention and assessed the possible variation of Body Mass Index, quality of life, eating habits and food intake. In particular, the correlation between the psychometric scales used (in particular the Binge eating Scale) and the variation of the Body Mass Index showed how there is a growing need for a correct psychiatric evaluation before the intervention that can act as a predictor of weight reduction (also in a long period of observation) and provide a tool to select the most suitable subjects for bariatric surgery.

Key words: psychopathology, binge eating, bariatric, obesity

Introduction

Obesity is a multifactorial and complex disease, affecting, along with overweight, over a third of the population worldwide [1] and, in 2001, the WHO introduced the term "globesity" (the union of the terms "global" and "obesity") to highlight the impact of obesity on both public health and economies [2]. The most used criteria for classifying obesity is the Body Mass Index (BMI) that is given by dividing body weight in kilograms and height in meters squared. This index ranges from underweight (< 18.5 kg/m^2) to severe or morbid obesity (≥ 40 kg/m^2). In addition to BMI, both in research and clinical practice contexts, the measurement of the circumference of the hips, the measurement of the abdominal adiposity as well as the evaluation of the hematic lipid profile is useful to complete the evaluation of the severity of obesity [3]. The multifactorial nature of obesity is expressed in the complex interaction between the causes that determine its origin: environmental [4], socioeconomical [5], genetical (32 common genetic variants influence the BMI) [6] and behavioural [7]. All these, with the exception of genetics, is modifiable risk factors [8]. Besides these aspects, however, a close correlation between psychological aspects and body weight has already been established [9]. The description of subjects suffering from pathological obesity has been discussed in many forms by different au-

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thors. Larkin and colleagues, for example, consider that the dysmorphism of obesity should be classified as an atypical depression or a dependence on food [10] while other psychopathological theories state the difficult interpretation of the differences between obese and non-obese subjects [11]. Studies that consider patients candidates for therapeutic intervention (dietetic or surgical) find higher values of depression, hysteria, hypochondria and impulsivity [11]. In fact, Collins and collaborators have shown that 20-70% of severe obese subjects suffer or have suffered in the past from a psychiatric disorder and the major depressive disorder would represent the prevalent pathology among these subjects, particularly among those who consider bariatric surgery [12]. A meta-analysis conducted in U.S. in 2016, confirm that the most common diagnoses among bariatric patients are depression (19%), binge eating disorder (17%) and anxiety (12%). This meta-analysis showed also how the prevalence of mood disorders among bariatric patients (23%) is much higher than in the general population (10%) [13]. Furthermore, in a recent study on candidates for bariatric surgery, it was found that 15.4% of the patients fully met the DSM-V criteria for Binge-Eating Disorder (BED; defined by eating a quantity of food, in a short period of time) [14] while 10.8% were classified as "sub-syndromic" BED (as some criteria were not fully met) with a clear prevalence of the female gender (about 80%) [15]. Bariatric surgery represents one of the most effective weight reduction interventions in severe obesity, particularly among those who are unable to lose weight through exercise and dietary changes and from 1998 to 2004 the number of interventions increased by 800% [16]. The American Society Metabolic and Bariatric Surgery (ASMBS) guidelines recommend bariatric surgery in the treatment of patients with BMI greater than 35 kg/m^2 and the presence of a documented related pathology (hypertension, type 2 diabetes, hypoventilative syndrome, sleep apnea syndrome) or patients with BMI greater than or equal to 40 kg/m^2 [17]. A fact-finding survey conducted by the International Federation for the Surgery of Obesity and Metabolic Diseases (IFSO), has portrayed a global overview of bariatric surgery. The total number of interventions carried out in 2013 is 468,609, steadily increasing over the past 10 years and almost the 96% of the operations were performed in laparoscopy. The highest volumes of bariatric surgery have been reported in the United States and Canada; in Italy 8,106 operations were registered. Gastric by-pass (GBP) is the most common surgery (45%), followed by sleeve gastrectomy (SG; 37%) and gastric banding (GB; 10%). Despite being the most performed procedure, gastric bypass has undergone a decline in recent years concomitant with an increase in sleeve gastrectomy [18]. The main aim of this study was to evaluate the possible variation of the psychopathological conditions pre (T0) and post-intervention (T1; 6 months), secondary aims were to assess the possible variation of BMI, quality of life, eating habits and food intake from T0 to T1.

Materials and methods

All participants received a detailed explanation of the study design and were asked to provide the Informed Consent according to the Helsinki Declaration (2013) [19] developed by the World Medical Association. The study was divided into two phases: Phase 1 (pre-intervention) and Phase 2 (post- intervention).

Phase 1 (pre-intervention)

After signing the informed consent, the enrolled subjects (all with an age ≥ 18) underwent a psychiatrist visit. The interviews, lasting between 60 and 75 minutes, were held face to face with the subjects examined and were conducted by qualified personnel (psychiatrist specialist and resident). The data collection was carried out anonymously and confidentially. The questionnaires belonging to the test battery of the study design are validated and widely used by the international scientific community and include: Symptom Checklist-90 (SCL-90) [20]; Eating Disorder Examination Questionnaire (EDE-Q) [21]; Binge eating Scale (BES)[22] and the Orwell test [23].
Contraindications to the intervention were: major psychiatric disorders (schizophrenia, mood disorders in the active phase, borderline personality disorder); alcohol and substance use disorders; moderate/severe mental retardation; inability to understand/sign informed consent; inability to join the post-operative program.

Phase 2 (post-intervention)

The patients underwent a 6-month follow-up visit. All the psychometric scales administered to T0 were repeated.

Statistical analysis

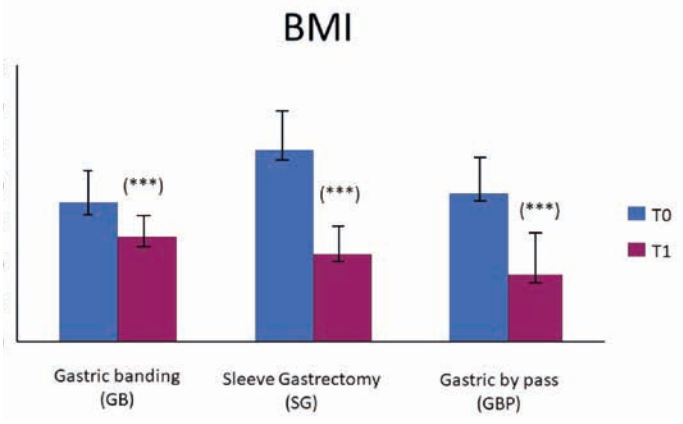
The qualitative variables were presented as frequency and percentage, the quantitative variables as mean and standard deviation. To analyze the effects of bariatric surgery on anthropometric (BMI) and psychometric variables (scores on the SCL-90, EDE-Q, BES and Orwell tests) a Variance Analysis (ANOVA) was used with repeated measures, evaluating any differences between T0 and T1. In case of significant results, a post hoc test of Duncan was performed.
A Pearson correlation analysis between BMI and scores on the psychometric scales was also conducted, in order to highlight psychopathological elements capable of influencing the extent of the weight loss obtained with the treatment.
The statistical significance threshold was $p < 0.05$. Statistic 8.0 software was used for data analysis.

Results

Fourteen-seven subjects (36 females and 11 males), divided into three subgroups according to the type of intervention chosen, were enrolled (Table I).

Table I. Composition of the study sample.

	TOT	F	M
Gastric banding	19	17	2
Sleeve gastrectomy	25	17	8
Gastric by-pass	3	2	1
TOT	47	36	11



(***) = p<0.001. BMI: Body Mass Index.

Figure 1.
Repeated measurement ANOVA results in the three treatment groups: F (2.44) = 38.76.

All subjects improved significantly in BMI from T0 to T1 (Figure 1).
Since the subjects underwent the different types of intervention and had a different and not directly comparable BMI at T0, the difference between BMI at T0 and BMI at T1 was used as a dependent variable. The difference between T0 and T1 (ΔT0-T1) was analyzed with a one-way ANOVA. As a result, a significant difference in the type of treatment ($F = 38.76$, $p < 0.001$) was observed and, the post hoc Duncan tests highlighted how SG and GBP operations lead to a greater reduction in BMI compared to GB (Table II).
A significant reduction over time of the scores of the BES, EDE-Q and Orwell scales was observed, while for SCL90 only a significance trend is observed (Table III). After the Bonferroni correction for multiple comparisons (uncorrected p value <0.05, corrected p value <0.003) was performed, a significant correlation between BES and BMI was found: the higher BES at T1 relates with the greater difference between T0 and T1 BMI. (Table IV).

Conclusions

Bariatric surgery is recognized as one of the most effective treatment of severe obesity in terms of weight loss and improvement of obesity-related diseases [24]. It is also given that a correct evaluation of the psychological and psychiatric aspects can correlate with different long-term outcomes [25]. This study highlights how certain values in psychometric scales before surgery (such as BES in our case), could be an important predictor of maintaining weight reduction in the medium-long term (6 months). However, not all patients receive equal benefit from the interventions and psychosocial factors are commonly considered important predictors of post-operative outcomes. In this regard, the objective of this study was to evaluate the possible variation of psychopathological conditions and the possible variation of BMI, quality of life, eating habits and control of pre and post-intervention food intake at T1 . Based on the results, all subjects improved significantly their BMI from T0 to T1, with better results for SG and GBP operations compared to GB. For what concerns the psychometric scales, a significant reduction over time of the scores of the BES, EDE and ORWELL scales was observed, while for SCL90 only a significance trend was observed. Eating habits and the control of the food impulse improve especially after SG, while the quality of life after GB. Other studies are needed to confirm these data and provide clinicians with useful tools to predict the success of an intervention and select more accurately patients suitable for bariatric surgery.

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Table II. Effects of different treatments on Body Mass Index.

	T0		T1		T0-T1		ANOVA T0-T1			
	mean	SD	mean	SD	mean	SD	F	df	p	Duncan post hoc effect
Gastric banding (GB)	37.5	4.5	33.3	4.5	-4.2	2.6	38.76	2,44	< 0.001	(GBP=SG) > GB
Sleeve gastrectomy (SG)	44.4	5.1	31.4	4.1	-13.1	3.4				
Gastric by-pass (GBP)	39	4.6	28.7	1.5	-9.3	5.4				

GBP: Gastric by-pass; GB: Gastric banding; SG: Sleeve gastrectomy.

Table III. Effects of treatment on psychometric scale scores

	Gastric Banding	Sleeve gastrectomy	Gastric	by- pass			ANOVA				
	Mean	SD	Mean	SD	Mean	SD	Effect	F	DF	p	Duncan Post-Hoc
SCL90 TOT							Time X Int	1.5	2; 44	0.07	/
T0	55.5	36.4	57.7	47.5	27.0	8.9					
T1	54.2	43.2	26.0	28.1	28.0	20.8					
BES TOT							Time	6.3	2; 44	0.02	T1 < T0
T0	14	11.3	13.5	9.8	9.7	11.6					
T1	10.5	10.4	2.8	5.3	6.7	7.3					
EDE TOT							Time	12	2; 44	0.001	T1 < T0
T0	2.5	1.1	2.4	1.3	1.8	0.9					
T1	1.7	1.3	0.8	1.1	0.9	0.5					
ORWELL							Time	9.4	2; 44	0.004	T1 < T0
T0	46.1	26.8	41.9	27.6	17.7	4.5	Int	3.7	2; 44	0.03	GBP < GB = SG
T1	21.1	18.3	31.6	21.7	14.8	11.4					

PS: Psychometric Scale; SCL-90: Symptom Checklist-90; Int: Interevent; BES: Binge eating Scale; EDE-Q: Eating Disorder Examination Questionnaire; GBP: Gastric by-pass; GB: Gastric banding; SG: Sleeve gastrectomy. In bold significative results.

Table IV. Correlation between the BMI delta and the scores of the psychometric scales, corrected for multiple comparisons using the Bonferroni correction.

	SCL-90 TOT_T0	SCL-90 TOT_T1	BES_T0	BES_T1	EDE-Q TOT_T0	EDE-Q TOT_T1	ORW TOT_T0	ORW TOT_T1
ΔBMI (T1-T0)	-,1306	,3430	-,0419	,4753	-,0638	,2976	-,0959	,4158
	p = ,382	p = ,018	p = ,780	p = ,001[a)]	p = ,670	p = ,042	p = ,522	p = ,004

[a)] Significant after correction for multiple comparisons (p corr > 0.003); SCL-90: Symptom Checklist-90-R; Int: Interevent; BES: Binge eating Scale; EDE-Q: Eating Disorder Examination Questionnaire; BMI: Body Mass Index; ORW: Orwell Test.

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