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RESEARCH ARTICLE

**EFFECTS OF SLEEVEGASTRECTOMY OPERATION ON DEPRESSION, ANXIETY AND
QUALITY OF LIFE**

Mesut Sipahi., Ali Irfan Gul., Ozgul Karaaslan and Ergin

Arslan, Hasan Borekci, Muzaffer Gencer

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ABSTRACT

Introduction: Obesity is known to be a major risk factors of many diseases such as diabetes, hypertension, cardiovascular diseases, osteoarthritis and sleep apnea. Obesity has also severe effects on psychological status and quality of life (QoL) of patients. Bariatric surgery, especially sleeve gastrectomy is an effectively used method in the treatment of obesity. The objective of this study is to investigate effects of Sleeve Gastrectomy on QoL, and its psychological impacts.

Material and Methods: This study included 34 morbid obese patients with a BMI>40 and obese patients with a BMI>35 and comorbidity who were scheduled for Sleeve Gastrectomy surgery in our clinic. All patients gave consent and preoperatively filled the Beck Depression Inventory, Beck Anxiety Inventory and SF36 Health-related Quality of Life Scale. Laparoscopic Sleeve Gastrectomy operation was performed under general anesthesia. Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and SF36 Health-related Quality of Life Scale were applied again in the postoperative 6th month.

Results: Accordingly, there were strongly significant differences between preoperative and postoperative 6th month evaluation of the patients in terms of BDI, BAI and subdimensions of SF-36 scale including physical functioning, physical role functioning, emotional role functioning, general health perceptions, vitality and mental health ($p<0.05$). The mean BDI was decreased by 9.41 and BAI by 6.15 points after six months. On the other hand, physical functioning was increased by 8.56, physical role functioning by 1.26, emotional role functioning by 1.1, bodily pain by 2.18 general health perceptions by 2.18, vitality by 7.47, social role functioning by 2.5 and mental health by 6.38 points.

Conclusion: Sleeve gastrectomy provides decrease in depression and anxiety scores, causing an increase in quality of life in the early period. Bariatric surgery patients should be followed-up in cooperation with the department of psychiatry.

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INTRODUCTION

Obesity is known to be a major risk factors of many diseases such as diabetes, hypertension, cardiovascular diseases, osteoarthritis and sleep apnea (1). In addition, psychosocial disorders are common among obese patients. In fact, effect of obesity on a poor quality of life has been argued to be greater than that of smoking, alcohol abuse and poverty (2). Especially morbid obese patients face with social exclusion, prejudices, social rejection and isolation(3, 4). Besides the problems caused by obesity, these patients have also to cope with social problems. Although most obese patients are in a normal psychological status, mood disorders are frequently seen especially in morbid obese patients(5). Oynike *et al.* found no significant difference between obese patients with a BMI value between 30-40 compared to normal population, while they found 5 folds higher depression in obese patients with a BMI >40 kg/m²(6). Histories of patients undergoing bariatric surgery revealed major depression by 19.3% to 28.2%(7). Kim *et al.* found that depression is the most common comorbidity among adolescents at 68%(8).

Bariatric surgery is an effective treatment method in obesity. Sleeve gastrectomy is the most frequently performed obesity surgery method with increased use in recent years. A rapid weight loss is seen within the first 6 months of operation, while a rapid regression is observed in obesity-related comorbidities including hypertension and diabetes(9). Patients also experience positive social changes in their life. In addition, droopness is observed in the body and face following a rapid weight loss. The objective of this study is to investigate effects of sleeve gastrectomy operation on quality of life (QoL) and mental health.

MATERIAL AND METHODS

This study included 34 morbid obese patients with a BMI>40 and obese patients with a BMI>35 accompanied by comorbidity who were scheduled for Sleeve Gastrectomy surgery in our clinic. The study was approved by Bozok University Ethics Committee. All patients gave consents and preoperatively filled the Beck Depression Inventory, Beck Anxiety Inventory and SF36 Health-related Quality of Life Scale. Age, gender and BMI values were recorded. Laparoscopic Sleeve Gastrectomy was performed under

general anesthesia. Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and SF36 Health-related Quality of Life Scale were applied again at the postoperative 6th month. Additionally, subdimensions of SF-36 scale including physical functioning, physical role functioning, emotional role functioning, general health perceptions, vitality, social role functioning and mental health were evaluated. Results of the both surveys were statistically assessed using SPSS software. Mean, median and standard deviation (SD) values of the parameters were calculated. Normality of data was evaluated through Kolmogorov Simirnov test and Histograms. Results of the Beck Depression Inventory and SF-36 Health Related Quality of Life Scale did not showed a normal distribution. The results obtained preoperation and at the postoperative 6th month were analyzed with Wilcoxon test. A $P < 0.05$ value was considered statistically significant.

Beck Depression Inventory (BDI): This is a self-assessment inventory used in order to determine the risk for depression and measure the levels and change in severity of depressive symptoms. It consists of total 21 sentences providing measurement based on a typical five-level Likert scale. The inventory can be applied on both healthy and patient groups. Each item is scored between 0 and 3. The total score is obtained by summing of the scores given to each item, and varies between 0 and 63.

The cut-off value for this inventory was accepted as 17 in validity and reliability studies for Turkish. BDI has been developed by Beck AT (1961) and adapted to Turkish by Hisli N (10, 11).

Beck Anxiety Inventory (BAI): has been developed by Beck and colleagues(12). It is a self-assessment scale used in order to determine frequency of anxiety symptoms that are experienced by an individual. It provides a typical Likert measurement. There are 4 options in each of twenty-one symptom categories. Each item is scored between 0 and 3. The points taken are direct proportional to the severity of anxiety experienced by a person. Validity and reliability study of this inventory has been conducted by Ulusoy *et al.* in our country(13).

SF-36: Short Form 36 (SF-36) scale which has a generic scale characteristic among the QoL scales and provides measurement from a broad perspective, has been developed and introduced by Rand Corporation in 1992(14). When developing the scale, it has been intended to provide a short and easy to apply scale with a wide spectrum of use. Among the features of SF-36, a marked one is being a self-assessment tool. The scale has several advantages including ability to be completed in shorter than 5 minutes and evaluation of negative aspect in addition to the positive ones.

Table1 Demographic evaluation results

n (34)	min	max	mean±SD	p
PO BAI	0	35	14,00±9,08	0.001*
PO BDI	0	38	13,47±11,14	0.000*
PF	10	29	20,18±6,91	0.000*
PRF	4	8	5,71±1,91	0,003*
Pain	2,0	12,0	8,78±3	0.000*
GH	7,0	24,4	14,31±5,44	0.000*
Vitality	6	20	11,91±3,93	0.000*
SF	3	10	6,65±2,11	0.000*
ERF	3	6	4,12±1,38	0.001*
Mental Health	11	27	18,41±4,15	0.001*
PO6 BAI	0	41	7,85±8,29	
PO6 BDI	0	14	4,06±3,08	
PO6 PF	20	30	28,74±1,34	
PO6 PRF	4	8	6,97±1,74	
PO6 Pain	9,0	12,0	10,95±1,23	
PO6 GH	16,4	24,4	21,02±1,88	
PO& Vitality	11	24	19,38±2,76	
PO6 SF	6	10	9,15±1,32	
PO6 ERF	3	6	5,21±1,27	
PO6 Mental Health	10	29	24,79±4,02	

SD: standard deviation, min: minimum, max: maximum, PO:Preoperation, PO6:Postoperative 6th month,BAI:Beck anxiety inventory,BDI:Beck depression inventory,PF:physical functioning,PRF:physical role functioning, GH: General health perceptions, SF:Social role functioning, ERF:Emotional role functioning
*Wilcoxon Signed Ranks Test

The scale consists of 36 items that measure 8 subdimensions including physical functioning (10 items), social role functioning (2 items), physical role functioning (4 items), emotional role functioning (3 items), mental health (5 items), energy/vitality (4 items), bodily pain (2 items) and general health perceptions (5 items). Validity and reliability study of SF-36 Turkish version has been performed by Koçyiğit and colleagues(15).

RESULTS

The mean hospitalization time was found as 4.5 days in 34 patients undergone Laparoscopic Sleeve Gastrectomy. One patient developed postoperative intraabdominal hemorrhage. Following transfusion of 4 IU blood and iv fluid therapy, bleeding was stopped and the patient was discharged with recovery. No any other complication was observed. Out of 34 patients, 8 were male and 26 female aged 18-57 with a mean age of 35.8 years. The lowest BMI was 37 kg/m² and the highest BMI was 60 kg/m². BMI was found between 35-40 in 2, between 40-45 in 16, between 45-50 in 8 and over 50 in 8 patients with a mean value of BMI was found as BMI 46,1 kg/m². Patients' results of Beck Depression Inventory, Beck Anxiety Inventory and SF-36 are summarized in Tables 1 and 2. Accordingly, there were strongly significant differences between preoperative and postoperative 6th month evaluation of the patients in terms of BDI, BAI and subdimensions of SF-36 scale including physical functioning, physical role functioning, emotional role functioning, general health perceptions, vitality and mental health (p<0.05). The mean BDI was decreased by 9.41 and BAI by 6.15 points after six months. On the other hand, physical functioning was increased by 8.56, physical role functioning by 1.26, emotional role functioning by 1.1, bodily pain by 2.18 general health perceptions by 2.18, vitality by 7.47, social role functioning by 2.5 and mental health by 6.38 points.

Table 2 Statistical analysis of the results

n (34)	mean±SD	min-max
BAI difference	6,1471±10,42	-28-28
BDI difference	9,4118±11,54	-4-37
PF difference	-8,5588±6,32	-20-0
PRF difference	-1,2647±2,15	-4-4
Pain difference	-2,1765±2,50	-7,4-2,6
GH difference	-6,7088±5,62	-14,4-4
Vitality difference	-7,4706±5,34	-17-5
SF difference	-2,5000±2,42	-6-3
ERF difference	-1,0882±1,58	-3-3
Mental Health difference	-6,3824±4,03	-14-2

SD; standard deviation, min; minimum, max; maximum, BAI:Beck anxiety inventory, BDI:Beck depression inventory, PF:physical functioning, PRF:physical role functioning, GH: General health perceptions, SF:Social role functioning, ERF:Emotional role functioning

DISCUSSION

In the present study, effects of bariatric surgery (Sleeve Gastrectomy) on psychopathology and quality of life were investigated. For this purpose; patients were asked to complete BDI, BAI and SF-36 before and 6 months after Sleeve Gastrectomy operation. Since objective of the study was to measure the change in BDI, BAI and SF-36 values pre- and postoperation, no any cut-off value was determined for the scales.

First, a statistically significant decrease was found in BDI scores given at the postoperative 6th month. This finding indicates that, patients have a psychopathology related to morbid obesity which was in tendency to fall after Sleeve Gastrectomy. This result is consisted with the previous similar

studies(16). A recent study conducted with Minnesota Multiphasic Personality Inventory Second Edition (MMPI-2) compared results of the scale before and after 6 month and 1 year of bariatric surgery. This study has found significant evident of decrease in physical symptoms, pathological preoccupation, depression, excessive lack of confidence, mental confusion and social withdrawal in morbidly obese patients after bariatric surgery (17). In another study, cut-off value was found as 12 points or higher for depression and 7 points or higher for cognitive-affective subscales of BDI in bariatric surgery population. Patients diagnosed with depression gave significantly higher scores to cognitive-affective items of the scale compared to those without diagnosis of depression(18).

In addition to establish diagnosis of psychiatric disorder through psychiatric interviews, in most studies symptoms such as depression and anxiety were standardized or evaluated through self-assessment psychometric test procedures as in our study(19). The primary objective of Swedish Obese Subjects (SOS) study was to investigate whether an extensive and long-term conscious weight loss would decrease the increased morbidity and mortality over a period of 20 years in obese subjects that have been treated with surgery and those have been treated conventionally(20). In 2-year and 4-year outcomes of the study, results obtained from all the instruments measured were improved with the more extensive weight loss resulted in better improvements in anxiety and depression symptoms(20).

In a prospectively designed study including face to face interviews with 107 extremely obese bariatric surgery patients, preoperative and postoperative prognosis and prognostic importance of anxiety and depression were investigated. The interviews were made at postoperative 6-12 months and 24-36 months. Unlike our study, the point prevalence of anxiety disorders was not decreased after surgery, while the point prevalence of depression was significantly decreased, consistently with the present study(21).

Some studies have focused on the effects of bariatric surgery on psychosocial functioning and personality and argued that these factors are not predictive for weight loss(22). However, another study has suggested that psychosocial and personality factors predicted improvement in health-related quality of life(23).

Predisposition to psychopathology has also been investigated in adolescent bariatric surgery patients. Zeller *et al.* examined depressive symptoms with BDI in 33 adolescent bariatric surgery patients and found minimal depression symptoms in 52%, mild depressive symptoms in 21%, moderate symptoms in 12% and severe symptoms in 53% of their patients(8).

Another important objective of the present study was to investigate whether there was any change in QoL of the patients pre- and postoperation. For this purpose, patients were asked to fill SF-36 (Short-Form Health Survey-36) QoL scale preoperation and at the postoperative 6th month. A significant increase was found in all parameters of SF-36 studied in the post-operative evaluation. This result was interpreted as a finding indicating increased QoL of the patients. As previously noted, some studies suggest that psychosocial functioning and personality characteristics

predict improvement in health-related QoL in bariatric surgery patients(23). In a study with 306 morbid obese patients seeking bariatric surgery, patients were given BDE and SF-36 scales. The results of that study demonstrate that health-related quality of life (HRQoL) is often impaired in this extremely obese population under risk and moreover, the risk for mood disorders is also increased(24).

Health care professionals dealing with evaluation and treatment of morbid obese patients who seek bariatric surgery should be aware of these patients having an increased risk for depression(25). As it was found in the present study, it can be said that Sleeve Gastrectomy has positive effects not only on weight loss, but also on QoL and psychosocial problems. These patients should not be regarded as only surgical patients and should be treated in cooperation with the department of psychiatry.

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