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Does bariatric surgery improve the patient’s quality of life?

Y. Martínez1, M. D. Ruiz-López1, R. Giménez1, A. J. Pérez de la Cruz2 and R. Orduña3


Abstract

Objective: The aim of this investigation was to assess the effect of malabsorptive bariatric surgery (BS) on the quality of life (QoL), applying the Nottingham Health Profile (NHP) and the bariatric analysis and reporting outcome system (BAROS).

Design: A prospective cohort study was performed in 100 adult patients (> 18 years) undergoing bariatric surgery by malabsorptive technique for one year.

Research methods and procedures: Patients were monitored from the beginning of the BS program until a year after the intervention, applying the NHP and the BAROS test. At baseline, the mean weight of the women was 132 ± 22 kg and the Body Mass Index (BMI) was 50.7 kg/m².

Results: The values obtained from different areas applying the NHP questionnaire showed statistical significant differences (p < 0.001) with respect to baseline values. According to the BAROS test, 48% of patients lost 25-49% of weight excess and 80.8% had resolved major comorbidities at 1 yr. According to the Moorehead-Ardelt QoL score, there were major improvements in employment and self-esteem in 89% and 87% of patients, respectively, and improvements in physical activity, sexual and social relationships. According to the total mean BAROS score, the outcome was considered “very good”.

Conclusion: NHP and BAROS questionnaires appear to be useful and easily applicable tools to assess the QoL of obese patients.

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Key words: Morbid obesity. Bariatric surgery. Quality of life. BAROS Test. Nottingham health profile.
Introduction

Obesity is one of the greatest public health challenges of the 21st century. It is now described as an epidemic, and a global strategy of “Diet, physical activity and health” for its prevention was approved by almost 200 countries at the last World Health Assembly held in Geneva in May, 2004.1 Morbid obesity (MO) has reached epidemic levels in developed countries.2 The latest data from the World Health Organization3 reported 1.6 billion overweight and 400 million obese adults (> 15 years) worldwide. In Europe, more than half of the adults between 35 and 65 years old are overweight or obese4 In Spain, the prevalence of obesity in the adult population (25-64 yrs) is estimated to be 15.5% and is higher in women (17.5%) than in men (13.2%), with 0.79% of men and 3.1% of women between 25 and 60 years of age having obesity grade II.4 Patients with MO are at higher risk of associated diseases (diabetes type II, hypertension, hyperlipidemia, obstructive sleep apnea, coronary disease) and a lower quality of life (QoL).

Bariatric surgery (BS) is currently considered the only effective treatment to obtain an adequate and sustained weight loss and a reduction of morbidity and obesity-related co-morbidities in patients with MO.5 BS can be classified into three procedures: a) mal-absorptive technique, which decreases the absorption of nutrients; b) restrictive technique, which causes a reduction in the gastric reservoir and a subsequent reduction of food intake; and c) mixed technique, with characteristics of the previous two procedures. Restrictive and mixed approaches have been described as the most effective to achieve weight loss.6 Novel therapies for obese patients must be evaluated in terms of both objective (e.g., mortality, co-morbidity, weight loss) and subjective (e.g., QoL) criteria.7 Researchers have addressed the impact of obesity on morbidity and mortality, also highlighting the social problems and costs produced by the disease.8 However, the repercussion of obesity on the QoL has only been investigated in the past decade.

The bariatric analysis and report outcome system (BAROS) has been available since 1998 and evaluates anti-obesity surgery using malabsorptive techniques until one year post-intervention.

Subjects, methods and procedures

We carried out a prospective, descriptive, and dynamic cohort study, which followed the patients (> 18 years) from the start of the protocol for bariatric surgery using malabsorptive techniques until one year post-intervention.

Participants

Participants were 100 persons undergoing treatment for obesity with bariatric surgery, over the age of 18 years (86 woman and 14 men), the mean age was 39 ± 10 years and the mean body mass index (BMI) was 50.7 ± 8.3 kg/m²).

Pretreatment evaluation for inclusion in this study consisted of the following: a thorough medical history and physical examination conducted by a study internist, a psychological assessment and structured psychological diagnostic interview conducted by a study psychologist, and a nutritional assessment with a registered dietitian.

The inclusion criteria for BS9 were body mass index (BMI) > 35 kg/m²; presence of associated co-morbidities; age 18-55 years; history of morbid obesity for more than five years; absence of alcoholism, other dependencies or severe psychiatric illness; multiple unsuccessful weight loss attempts and signed, informed consent to the surgery. The study was approved by the Ethical Committee of our hospital according to Helsinki Declaration criteria.10

Assessment instruments

Two questionnaires were administered to patients: the Nottingham Health Profile (NHP) and BAROS. The NHP measures: perception of health and evaluates the effect of health problems on everyday activities; it consists of 38 Yes/No questions and measures energy, pain, emotional reactions, sleep, social isolation, and physical mobility. Scores range from 0 (absence of any health problem) to 100 (presence of all health problems). A validated Spanish version of the NHP was used.11 The BAROS assesses: percentage of excess weight loss (%EWL); improvement in medical conditions associated with obesity; and post-BS QoL, employing the Moorehead-Ardelt test, which uses simple drawings to offer 5 alternatives for questions on self-esteem, physical activity, social life, employment and sexual sum of scores for each question activity, with a maximum score of 3 points for each question. Final scores (sum of scores for each question) are obtained by deducting points for complications or repeat surgery: > 7 excellent, 7 > 5: very good, 5 > 3: good result, 3-1: fair; 1-0: failure. The test and a full interpretation are available at http://drmoorehead.com/.

Data were gathered before surgery and at 3, 6, and 12 months post surgery on: the presence of comorbidities, including diabetes, hypertension, arthritis, sleep apnea syndrome, hyperlipidemia, cardiovascular disease; weight, height, BMI, and percentage weight loss. Follow up of patients was carried out by the medical nutrition consultation.

Statistical analysis

Results were expressed as means ± standard deviation. Quantitative variables with normal distribution
were analyzed with the Student-t and ANOVA tests. Non-parametric variables were analyzed using the chi-square test. The Lambda de Wilks test was applied for the multivariate analysis. p < 0.05 was considered significant. SPSS v.15 software for Windows (SPSS Inc, 2008) was used for the analysis.

Results

The study included 100 patients. The mean age was 39 years, and 86% were female. According to pre-BS interview results, all patients had made attempts to lose weight: 65% with a hypocaloric diet, 21% with liquid diets, and 10% with lifestyle diets. With regard to physical activity, 7% performed aerobics, 10% exercised with fitness equipment, 44% walked regularly and 38% were not engaged in any physical activity to lose weight. A solution had been sought from an herbalist by 43% and from a physician by 36%, with 20% seeking no advice. Table I shows the age, weight, height and BMI of the patients before the BS, showing significant differences between men and women except in BMI. According to the BMI values, patients presented obesity grade IV or extreme obesity.

Weight changes

After the intervention was a follow-up that shows the evolution of these parameters at 3, 6 and 12 months (table II). Significant differences (p < 0.001) in weight and BMI were found between sexes and between time points (3 vs. 6 months and 12 vs. 6 months).

Table I
Socio-demographic and anthropometric baseline data

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample (n)</td>
<td>14</td>
<td>86</td>
<td>100</td>
</tr>
<tr>
<td>Age (yrs)</td>
<td>34 ± 12.8</td>
<td>40.8 ± 9.5**</td>
<td>39 ± 10</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>153.6 ± 25.5</td>
<td>128 ± 19.7*</td>
<td>132 ± 22</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>171.8 ± 10.0</td>
<td>159 ± 5.8*</td>
<td>161 ± 7.6</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>52.1 ± 8.1</td>
<td>50.1 ± 8.4</td>
<td>50.7 ± 8.3</td>
</tr>
</tbody>
</table>

*p < 0.001  **p < 0.05.

Secondary complications

There was a follow-up of gastrointestinal secondary complications (e.g., diarrhea, constipation, vomiting, trouble swallowing and flatulence) throughout the clinical history after the intervention of these patients at 3, 6 and 12 months. A significant reduction (p < 0.001) over time was observed in the number of patients with diarrhea (from 71 to 21), trouble swallowing, (from 57 to 45) and vomiting (from 53 to 25). At one year after the BS, 58% tolerated a normal diet without restrictions, 28% did not tolerate bread, and 14% did not tolerate dry rice or white fish.

Comorbidities

Patients had a mean of 2.38 ± 2 comorbidities before the BS, with only 4 patients having no obesity-related comorbidities and 67 having more than one. Hyperlipemia was the most frequent comorbidity, followed by arterial overload and hypertension. A significant reduction (p < 0.001) in comorbidities was found one year after the intervention (hyperlipemia from 68 to 6%, arterial overload from 59 to 3%, hypertension from 48 to 2%, diabetes mellitus from 22 to 1%, sleep apnea from 17% to 0%).

Quality of life

Table III lists NHP questionnaire results before and at one year after BS. Before the intervention, patients showed a major impairment of physical activity (energy), with no significant differences between sexes, and a positive correlation was found between this and weight and also with BMI (p < 0.001).

NHHP results significantly differed (p < 0.001) between before and one year after the BS (table III). A significant correlation (p < 0.05) between mobility and weight was observed during the post-intervention period.

Weight changes

After the intervention was a follow-up that shows the evolution of these parameters at 3, 6 and 12 months (table II). Significant differences (p < 0.001) in weight and BMI were found between sexes and between time points (3 vs. 6 months and 12 vs. 6 months).

Table II
Weigh and BMI at different time points (months)

<table>
<thead>
<tr>
<th></th>
<th>Men (n = 14)</th>
<th>Women (86)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Months</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>153.6 ± 25.5</td>
<td>122.2 ± 2.2</td>
<td>104.8 ± 17.7</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>52.1 ± 8.1</td>
<td>41.4 ± 7.4</td>
<td>35.6 ± 5.8</td>
</tr>
</tbody>
</table>

*p < 0.05

Table III
Evolution of the QoL according to NHP before and at 1 yr after the BS

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>90.6 ± 16.4</td>
<td>23.6 ± 18.5**</td>
</tr>
<tr>
<td>Pain</td>
<td>72.7 ± 19.6</td>
<td>11.0 ± 7.7**</td>
</tr>
<tr>
<td>Sleep</td>
<td>81.0 ± 15.1</td>
<td>18.4 ± 11.9**</td>
</tr>
<tr>
<td>Social Isolation</td>
<td>84.4 ± 20.6</td>
<td>18.6 ± 15.6**</td>
</tr>
<tr>
<td>Emotional Reactions</td>
<td>70.5 ± 21.2</td>
<td>13.6 ± 9.9**</td>
</tr>
<tr>
<td>Mobility</td>
<td>70.0 ± 20.2</td>
<td>12.8 ± 11.5**</td>
</tr>
</tbody>
</table>

**p < 0.05.
BAROS test results in different areas were:

a) % excess weight loss (%EWL).
   Table IV shows that 48% of patients lost 25-49% of excess weight and 38% of patients lost 50-74% of excess weight.

b) Medical conditions
   Major comorbidities were resolved in 81% of patients with regard to QoL (table IV).

c) Quality of life (Moorehead-Ardelt).
   Table IV shows the results of each of the areas studied in this part of the test. 89% of patients considered that the intervention had improved their possibilities of finding employment, and 87% reported an increase in their self-esteem. More than 80% of patients described improved physical activity and sexual relationships as a result of the surgery.

The BAROS test used to define success or failure of the intervention. Figure 1 shows the results of the surgery according to the score BAROS.

According to the total mean BAROS score, the outcome was considered “very good”, can be seen in table V.

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### Table IV

**Bariatric Analysis and Reporting Outcome System (BAROS)**

<table>
<thead>
<tr>
<th>I. Weight loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss % of excess</td>
</tr>
<tr>
<td>Weing gain</td>
</tr>
<tr>
<td>0-24</td>
</tr>
<tr>
<td>25-49</td>
</tr>
<tr>
<td>50-74</td>
</tr>
<tr>
<td>75-100</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Medical condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes groups</td>
</tr>
<tr>
<td>Number of patients</td>
</tr>
<tr>
<td>Percentage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. Quality of life (Moorehead-Ardelt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of life</td>
</tr>
<tr>
<td>Self-esteem</td>
</tr>
<tr>
<td>Physical</td>
</tr>
<tr>
<td>Social</td>
</tr>
<tr>
<td>Labor</td>
</tr>
<tr>
<td>Sexual</td>
</tr>
</tbody>
</table>

**Discussion**

Surgery is the optimal approach to the treatment of MO according to the North American Public Health Institute (NAPHI 1991), which stated that the results and benefits of surgery exceed its intrinsic risk.13

The study population had made major efforts to lose weight using different strategies without any success due to any improvement in eating habits, life style or compliance with psychological or medical treatment.16

Lack of success can also be attributed to an absence of nutritional education, aggressive and misleading com-
compliance with dietary guidelines.20 Vomiting is produced (diarrhea, constipation, vomiting) are due to poor com-

Bariatric surgery & quality of life

Although obesity represents a major health problem, especially due to its comorbidities, it is also considered

Surgeries with restrictive components cause dynamic changes in the size and shape of the stomach. As a result, some patients fail to comply with eating guidelines and require individualized monitoring20-21 with detailed nutritional information to change eating habits and promote the selection of a diet appropriate to the technique applied and the postoperative stage. Some foods are more suitable than others. Thus, red meat is not tolerated as well as white meat,22-23 especially if large pieces are eaten, and the same is true for raw vegetables, fruit with peel and legumes.21 In the present study, the best tolerated foods were bread, dry rice, and fish.

Some post-surgical gastrointestinal complications (diarrhea, constipation, vomiting) are due to poor compliance with dietary guidelines.20 Vomiting is produced by eating too fast, inadequate mastication of foods, mixing liquids with solids, consuming an amount that is larger than the gastric reservoir, or sometimes because of the intake of a novel food. Most of these problems markedly improve with appropriate re-edu-
cation, modification of food texture, and use of prokinet-
ics.

Diarrhea is common after BS and is also caused by

With regard to the percentage of excess weight loss, BAROS results showed a mean value of 60%. Dominguez-Diez et al26 obtained 45% EWL and 67% EWL at 6 and 12 months after surgery, respectively, and Marceau et al31 reported a 73% EWL at 4.5 years.

With regard to the comorbidities, we observed an acceptable reduction of weight at 1 year after the surgery, alongside a favorable outcome for obesity related comorbidities and a notable improvement in patients’ perception of their health status.

Moorehead-Ardelt test results (BAROS) showed improvements in employment, self-esteem and physical activity in a high percentage of patients at 1 year, although 24.2% reported no change in their social and sexual relationships. In another study,22 improvements in self-esteem were reported by 94% of patients, in physical activity by 100%, in social life by 69%, in employment situation by 75% and in sexual relationships by 53%.
In the view of our group and many other researchers\textsuperscript{11-34}, the combined mal-absorptive/restrictive technique satisfies the objectives of BS with a good balance between outcome and complications. It improves the QoL and associated comorbidity by achieving an adequate and sustained weight loss with an acceptable morbidity-mortality.

Conclusions

In addition to the BAROS being an easily applicable test, not only does it measure the quality of life of the patient but also the success of the intervention, being the health profile of Nottingham (NHP) a complement to measure quality of life related to health (CVRS). However, we suggest that it would be interesting to include some items that make reference to the food nourishment and digestive complications that tend to be present and that can indirectly skew the result of the test.

References

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