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The women's quality of life after bariatric treatment of morbid obesity.

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ABSTRACT--*The prevalence of morbid obesity has been found to be higher in women than in men. The article focuses on the quality of life of women suffering from morbid obesity.*

Keywords-- *morbid obesity, bariatric surgery, quality of life.*

I. INTRODUCTION

Chronic polymorphic (symptomatic, etiological and pathogenesis) disease is currently being defined under morbid obesity, accompanied by an increased BMI (Body Mass Index) and an increase in the fat depot cluster. The value of BMI at morbid obesity makes ≥40 kg/m^2 or ≥35 kg/m^2 at presence of concomitant diseases [1].

The urgency of the issue is due, first of all, to the high prevalence of morbid obesity in the population and the absence of trends to decrease. It should be noted that today very unoptimistic data from WHO indicate that up to 1.9 billion adults (39%) have excess body weight, about 650 million of them (14% of all) suffer from morbid obesity [2].

According to the results of the epidemiological researches organized by the specialists of IASO, it is shown that undeniable leaders on the scales of this problem are the states of the USA and Western Europe. Over the last quarter-century, the number of obese patients in the EU has tripled, to nearly 50% today. Moreover, in the European Union states, excessive body mass is observed in almost every 5th child, 1/3 of whom have clear signs of obesity [3,4].

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According to official statistics, about 23.5 million citizens were registered in the Russian Federation at the end of 2016 with BMI > 30 kg/m^2 [1].

In the scientific periodicals, in particular on the statistics of the pathology of fat metabolism, it is stated that morbid obesity is much more common in women than in men [5].

It is important to note that in recent years there has been a progressive growth of different variations of all kinds of neuroendocrine diseases in women of reproductive age, accompanied by a violation of fertility against the background of obesity at one stage or another [1,2,3,6].

In the therapy of morbid type obesity conservative ways, such as modification of the way of life, physical exercises, adherence to a specialized diet, psychotherapy, treatment with medicines, played a leading role for a long time [1,3].

However, for the sake of justice, it should be noted that conservative methods for correcting morbid obesity in order to reduce BMI are difficult and not effective. In this connection, during the last few decades, the standard in the therapy of people with morbid form of obesity and metabolic syndrome is considered to be bariatric surgery [1,3,5].

There is no doubt that the high level of effectiveness and safety of bariatric surgery compared to conservative methods clearly show the results of the Swedish study called SOS[6]. The researchers demonstrated the results of prospective analysis for 10 years of observation of the condition of 4047 patients suffering from morbid obesity. It turned out that the efficiency in the category of "bariatric surgery" was on average 16% comparing to changes in the parameters of body weight. It is interesting that in the category where conservative methods of weight reduction were used, on the contrary, those under study increased their body mass by an average of 1.5% [6].

It is in this context that the study of the quality of life parameters is becoming one of the most common and universally recognized methods for determining the course of chronic diseases in general, and in women suffering from morbid obesity in particular.

Thus, according to the first definition of the World Health Organization (WHO), the quality of life is "the perception of individuals of their position in life in the context of the culture and values of the environment in which they live, it is inextricably linked to their goals, expectations, standards and concerns" [7,8]. Of course, the fact of low quality of life of patients suffering from morbid obesity is obvious, and the prevalence of the disease is steadily growing, namely in geometric progression, while negatively affecting not only life expectancy, but also their reproductive health.

In this regard, the problem of morbid obesity has not only medical but also social significance. The above-mentioned studies clearly demonstrate far from being new but very evidence-based studies showing a statistically significant connection between poor quality of life and a high body mass index (BMI) [9,10].

However, in the available literature we did not find studies where various options of bariatric surgeries would be assessed as well as the terms of influence after their performance on the quality of life (according to accessible questionnaires) of women of the cohort studied.

II. THE AIM OF THE STUDY

To assess the quality of life of women suffering from morbid obesity before and after bariatric surgery.

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III. MATERIAL AND RESEARCH METHODS

This prospective, comparative clinical study was performed on the basis of the surgical department of Semashko Road Clinical Hospital at the Lublino station (head doctor – Mazarchuk V.), as well as on the basis of the No. 1 Department of Faculty Surgery of Sechenov First Moscow State Medical University (head of the department – full member (academician) of the Russian Academy of Sciences, MD professor Chernousov A.)
In the course of the study, the outcomes of the surgical treatment of morbid obesity in patients of reproductive age (n = 110) using laparoscopic mini gastric bypass (group I (n = 55)) and laparoscopic gastroplasty (group II (n = 55), selected by the "blind" method were analyzed. The control group was made by 30 (n=30) conditionally healthy women with a normal body weight (BMI=18.5 - 24.9 kg / m2) of the same age without violation of the menstrual and fertile function.

The criteria for inclusion in the research were

- Women suffering from morbid obesity (BMI over 40 kg/m2);
- reproductive age (19-44 years);
- informed consent to participate in the research.

The criteria for exclusion were

- the age of women less than 19 and older than 44 years (pre and postmenopausal);
- pregnancy and lactation;
- the presence of contraindications for bariatric operations (exacerbation of gastric ulcer and duodenal ulcer);
- the presence of severe somatic diseases in the stage of decompensation;
- the presence of cancer;
- mental disorders;
- lack of proper patient discipline, non-compliance with recommendations and the possibility of participation in long-term post-operative observation.

In order to assess the anthropometric status, the Ketle index (Kipping C. et al., 2010), also called the Body Mass Index (BMI), was determined by the following formula:

$$BMI\ (kg/m^2) = \frac{body\ weight, kg}{(height, m)^2}$$

When interpreting the BMI results, 18.5 to 24.9 kg/m2 indicated a normal weight. In the event of deviation, BMI 25 – 29.9 kg/m2 was defined as overweight and BMI ≥30 kg/m2 – obesity. A serious change in health, characterized by abnormally high body weight, with BMI exceeding ≥40 kg/m2, was defined as morbid obesity.

The quality of life of women in the cohort studied was analyzed using the SF-36 questionnaire. It includes 36 questions, which are grouped into eight scales:

- physical functioning;
- physical role;
- bodily pain;

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- general health;
- viability;
- social functioning;
- emotional state;
- mental health.

Two parameters were formed from the above indicators: psychological and physical components of patients' health. The assessment of the quality of life parameters for the patients of the cohort studied was carried out before and in 6, 12 months after the operation.

The scientific and statistical program of the research included the collection of statistical material and the registration of medical documentation data, the development of criteria for inclusion and exclusion from the research, the mathematical and statistical processing of the received data, the analysis and generalization of the results obtained.

Statistical processing of the array of received data was carried out using the software package SPSS 7.5 for Windows (IBM Analytics, USA). The average arithmetic and RMS deviations were calculated. The correspondence of these data to normal distribution was confirmed with the application of the Kolmogorov–Smirnov criterion. For comparison of two samples, the t-criterion was used with the significance level of $p < 0.05$.

IV. RESULTS OF THE STUDY

Patients with morbid obesity were between the ages of 19 and 44, the average age was 29.8 ± 5.9 years. The age of women in the control group did not differ statistically ($p \geq 0.05$).

The study analyzes all key parameters of quality of life of the patients of the cohort studied and women of the control group (Table 1).

Table 1: Changes in the quality of life of patients after laparoscopic gastric bypass in patients of group I.

Scales	SF-36 questionnaire, points			
	I group (n=55) L-s GB			Control group (n=30)
	Before operation	6 months after	12 months after	
physical functioning — PF;	41.2 ± 24.3	58.8 ± 24.7*	62.1 ± 26.6*	64.8 ± 24.1*
physical role — RP;	18.3 ± 31.4	47.4 ± 28.8*	55.3 ± 32.9*	60.2 ± 35.4*
general health — GH;	25.1 ± 17.4	38.3 ± 23.1*	43.6 ± 18.2*	48.3 ± 21.1*
viability — VT;	37.4 ± 19.2	54.2 ± 16.6*	59.1 ± 18.3*	61.5 ± 17.1*
social functioning — SF;	53.4 ± 18.3	62.4 ± 24.7*	65.6 ± 26.4*	66.2 ± 29.2*
emotional role — RE;	23.8 ± 31.2	52.7 ± 31.6*	53.9 ± 42.6*	64.5 ± 44.1*
mental health — MH.	42.6 ± 15.3	55.4 ± 13.1*	58.3 ± 12.2*	60.1 ± 12.3*

Note: * - statistically valid difference with initial data before treatment $p<0.05$.

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The study found a statistically significant reduction in pre-operative life-quality parameters such as physical functioning (PF) by 1.57 times, and physical role (RP) by 3.2 times compared to the control group ($p < 0.05$). The qualitative indicators of general human well-being such as: general health (GH) 1,9 times; and viability (VT) 1,6 times ($p < 0,05$) were significantly low compared to women with normal weight of similar age.

There are some interesting statistical differences in the estimated parameters of emotional and mental health of the quality of life of women suffering from morbid obesity. The marked statistically significant differences of 2.7 and 1.4 times, respectively, were obtained by such parameters as: emotional role (RE) and mental health (MH), compared with women from the control group ($p < 0.05$). The above data are undoubtedly reflected in the social activity in the cohort of the patients studied. Thus, the socially detested parameter (social function- SF) was 1.2 times larger in the group of patients with morbid obesity, compared to women with normal body weight ($p < 0.05$).

The results are summarized in Figure 1. The quality of life and health status compared to prior surgery were significantly better in all groups of patients.

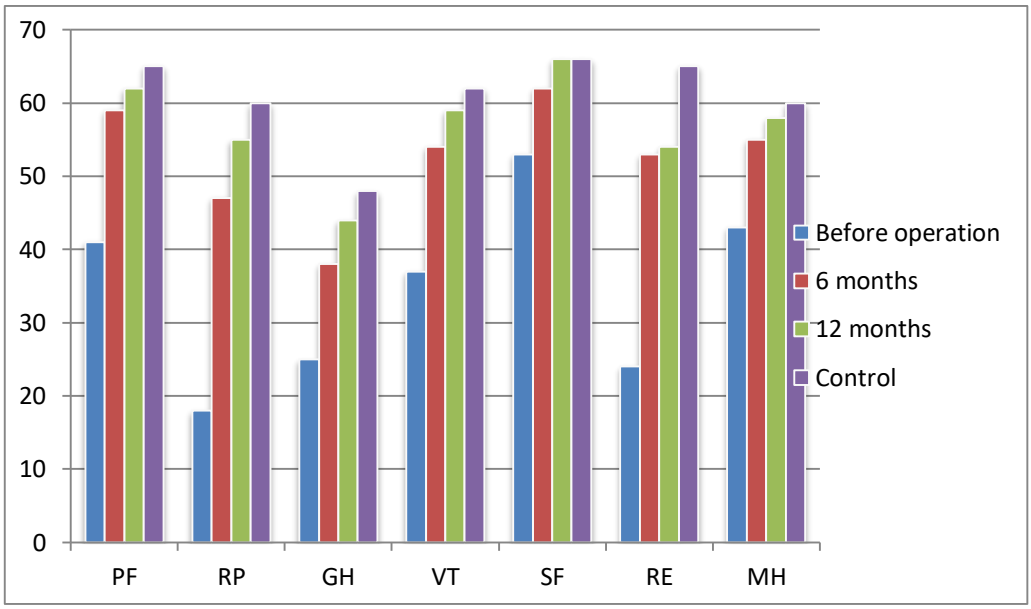

Figure 1: Trends of quality of life change in 6 and 12 months after operation in the I group.

According to Figure 1, the fact of a reliable improvement in the quality of life is evident in the total physical component of health (physical role - RP) in women suffering from morbid obesity 6 and 12 months after the operation 2.5 and 3.0 times, respectively, compared with the parameters studied before the operation ($p < 0.05$). A similar positive trend in improving the quality of life indicators was observed in the emotional component of health: 2.2 and 2.3 times significantly higher, respectively, in comparison with the data before the operation ($p < 0.05$). In women of the studied cohort the signs of social maladjustment were leveled at 1.16 and 1.22 times, respectively, compared with similar criteria before the operation ($p < 0.05$).

Similarly, all the key parameters of the quality of life of patients of the II group after laparoscopic gastroplasty were studied (Table 2).

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Table 2: Changes in the quality of life of patients after laparoscopic gastroplasty in patients of group II.

Scales	SF-36 questionnaire, points			
	II group (n=55) L-s GP			Control group (n=30)
	Before operation	6 months after	12 months after	
physical functioning — PF;	44.6 ± 24.2	48.1 ± 22.7*	54.2 ± 24.7*	64.8 ± 24.1*
physical role — RP;	17.9 ± 32.1	39.9 ± 29.9*	45.4 ± 31.8*	60.2 ± 35.4*
general health — GH;	26.2 ± 14.3	30.4 ± 22.1*	38.5 ± 21.1*	48.3 ± 21.1*
viability — VT;	36.3 ± 18.1	54.1 ± 16.5*	59.2 ± 17.4*	61.5 ± 17.1*
social functioning — SF;	52.5 ± 19.4	58.6 ± 24.6*	60.7 ± 27.5*	66.2 ± 29.2*
emotional role — RE;	24.0 ± 31.2	52.8 ± 31.7*	50.9 ± 41.6*	64.5 ± 44.1*
mental health — MH.	43.7 ± 15.2	50.3 ± 12.2*	57.4 ± 13.3*	60.1 ± 12.3*

In this study, in Group II, statistically significant differences were also found in reducing such parameters of quality of life before surgery as: Physical functioning (PF) by 1.45 times, as well as physical role (RP) by 3.3 times, respectively, compared with the control group ($p < 0.05$). The statistical analysis also showed a similar difference of 1.8 and 1.6 times, respectively, compared with women of normal body weight and similar age, with key qualitative indicators of general health (GH) and vitality (VT) ($p < 0.05$).

It should be noted that statistically significant differences of 2.6 and 1.3 times, respectively, were obtained from the parameters of mental health as: Emotional role (RE) and mental health (MH), compared with women from the control group ($p < 0.05$).

Signs of social maladjustment on the parameter under study as social function (SF) were reliably recorded more than 1.3 times, respectively, in the group of patients of the cohort studied, compared to women with normal weight ($p < 0.05$).

The research results of Group II patients on post-surgery quality of life parameters are also summarized in Figure 2.

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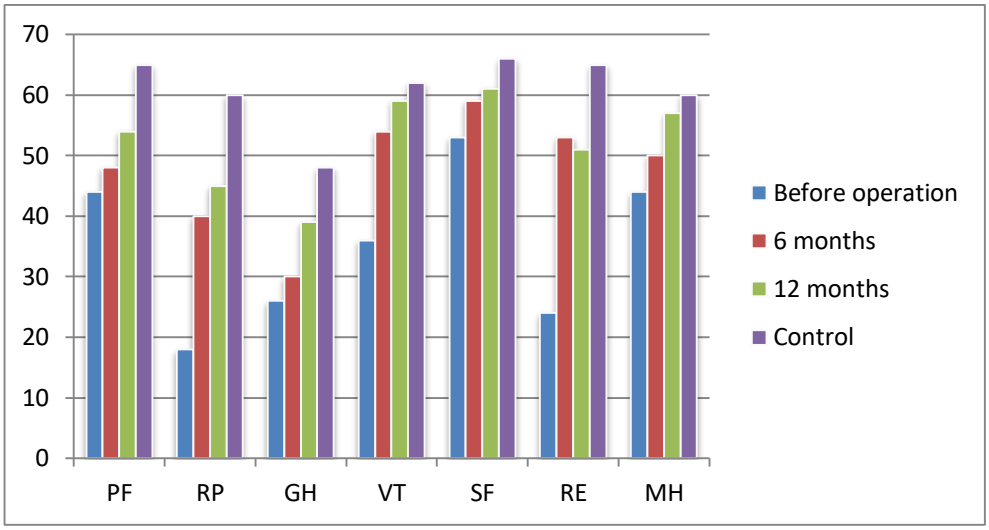

Figure 2: Trends in the quality of life in 6 and 12 months after the operation of Group II.

A similar trend associated with a statistically significant improvement in the quality of life was observed in the second group, Figure 2 ($p < 0.05$). Thus, the total data for the physical health component (physical role - RP) of patients in the second group 6 and 12 months after the operation were 2.22 and 2.5 times higher, respectively, compared to the indicators before the operation ($p < 0.05$).

In group II 6 and 12 months after the operation positive dynamics were also observed on the emotional component of health: 2.2 and 2.1 times, respectively, reliably higher, compared to the indicators before the operation ($p < 0.05$). Statistically significant with the tendency to increase the signs of social maladjustment of 1.11 and 1.15 times, respectively, in comparison with the data before the operation ($p < 0.05$) have changed.

Thus, summarizing the above data it should be concluded that the quality of life and health in comparison to the prior surgery were much better in both groups of patients suffering from morbid obesity.

Comparative analysis of the impact on the quality of life of the two bariatric methods (Laparoscopic gastric bypass and gastroplasty) did not reveal statistically significant differences between the groups, respectively ($p \geq 0.05$). Thus, improvements in the quality of life in total for the physical component of health (physical role - RP) in women suffering from morbid obesity 6 and 12 months after the operation 2.5 and 3.0 times in the first group and 2.2 and 2.5 times, respectively, compared to the parameters studied before the operation in the second group ($p \geq 0.05$).

According to the emotional component of health: 6 and 12 months after surgery in 2.2 and 2.3 times in the first group and 2.2 and 2.1 times, respectively, were statistically unreliable, compared to the data in the second ($p \geq 0.05$).

On the leveling of the signs of social maladjustment: in the same period after the operation in the first group in 1.16 and 1.22 times and 1.11 and 1.15 times, respectively, in comparison with similar criteria in the second group were also statistically insignificant ($p \geq 0.05$).

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V. DISCUSSION OF THE OBTAINED RESULTS.

The prevalence of obesity is steadily increasing worldwide. For example, Kazakh colleagues found that the average prevalence of excess body weight in women was 30.6%, and has no trends to decrease [11]. And it is no secret that today the problem of obesity in general, and morbid in particular, are the most common chronic diseases, in the world - recognized as the "non-infectious epidemic of the XXI century".

Women suffering from morbid obesity face not only physical and psychological problems, which significantly reduce the quality of their life, but also reproductive ones, transferring them to the rank of socially significant. And there is a clear link between morbid obesity and poor quality of life in all its aspects [12]. For the sake of justice, it is necessary to note that today the problems of studying the quality of life have proved to be the key objective criterion for many scientific researches. Paradoxically, however, only 2% of clinical trials analyzed the parameters of the quality of life before and after surgery depending on the period. It should be noted that the results of several works have found that 30% of researchers evaluate not generally accepted criteria, but rather specific parameters of quality of life, specially adapted for a specific pathology [13,14].

It is absolutely logical that as the BMI decreases in women suffering from morbid obesity against the background of a decrease in the frequency of combined and / or multisystem somatic diseases, as well as improving the parameters of reproductive health and, of course, their quality of life increases.

But, at the same time, the conclusions of the above should be confirmed not only by a logical presentation, but by a reliable statistical analysis.

For example, in one study, our home colleagues analyzed the dependence of the dynamics of body weight, quality of life and changes in the frequency of accompanying diseases in patients after such bariatric interventions as gastric banding and gastric bypass [15]. It turned out that after the gastric bypass, a statistically significant interconnection was established only between the body weight of patients and the dynamics of accompanying diseases. It was also shown that the higher the patient's weight, the higher the level of concomitant diseases. And in the group after gastric banding, there was a significant statistical interconnection only between BMI indicators and the quality of life index, that is, the higher the body weight of the patient, the worse the quality of life indicators [15]. It is established that the quality of life of patients after gastric bypass did not depend either on the weight of the body or on the frequency of accompanying somatic diseases [15].

It must be controversial, but the study did not reveal any relation between the criteria of the quality of life of the patient after gastric banding and the dynamics of accompanying diseases, and after gastric bypass testing, there was an absolute lack of dependence of the parameters of quality of life on any of the analyzed indicators. The researchers fairly conclude that the result of the operation in morbid obesity cannot be assessed by only one criterion, since the quality of life of patients is multifactorial [15].

Special attention should be paid to the positive "leap" of the quality of life indicators in 6 and 12 months after the operation and in our research. The indicators of physical and psychological well-being almost reached the values of population norms after undergoing bariatric interventions.

VI. THE RESULTS OF THE RESEARCH

A statistically significant reduction was set in all the studied parameters of quality of life before operation by 1,57, 3,2, 2,2 times as compared to control group ($p < 0,05$).

A comparative analysis of the effect on the quality of life of two bariatric methods (laparoscopic gastric bypass and laparoscopic gastroplasty) reveals no statistically significant differences between the groups studied ($p \geq 0,05$).

VII. CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

VIII. SUMMARY

To date, bariatric surgery continues to take a leading position in records for the treatment of morbid obesity and metabolic syndrome, significantly exceeding conservative correction methods.

IX. CONCLUSION

Bariatric surgery regardless of the type of intervention (laparoscopic gastric bypass and/or gastroplasty) statistically significantly improves the quality of life of women suffering from morbid obesity.

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