

SCALE FOR ASSESSING INDIVIDUAL RISK OF BARIATRIC SURGERY

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Abstract

Thus, the developed “Scale for assessing the individual risk of bariatric surgery” has sufficient sensitivity and specificity to predict any complications, and can be used in clinical practice to predict and manage the risks of this type of surgical intervention.

Keywords: gastric bypass, longitudinal resection of the stomach in combination with small intestinal bypass.

Introduction

Currently, obesity is a significant medical and social problem, which is due not only to its high prevalence, but also to the significant costs of treating associated diseases and their complications. The problems of overweight and obesity have important economic consequences associated with both increased healthcare costs and decreased performance, labor efficiency and income [1, 15, 23, 27, 29]. In Uzbekistan, the prevalence of obesity and overweight among the adult population ranges from 20.5% to 54%. There is a significant increase in the prevalence of obesity not only among the adult population, but also among children and adolescents [18, 29]. In the modern world, the number of overweight people increases by 10% every 10 years. This made it possible to define obesity as a non-communicable epidemic associated with a high risk of morbidity and mortality. It is known that due to the high frequency of severe concomitant diseases, obesity leads to disability in young people of working age. Obesity ranks fifth among the factors that increase the risk of death, as it reduces the life expectancy of patients by 5-20 years depending on age, gender and nationality. An increase in the body mass index by 5 units increases the risk of patient mortality by 31%. A body mass index of more than 40 kg / m² increases the mortality of patients aged 35-45 years by 6 times, and aged 25-30 years by 12 times, compared to people with normal body weight. The World Health Organization has published data that every year about 3.4 million adults die due to obesity and overweight [1, 2, 3, 4, 5, 6, 7, 8].

Obesity-associated diseases significantly worsen the quality of life of patients and significantly reduce its duration [1, 2, 3], [14, 17, 32]. The higher the degree of obesity, the higher the risk of developing associated diseases and their complications. Not only the degree of obesity, but also the type of obesity is associated with a high incidence of concomitant diseases. Many studies have proven that obesity is a risk factor for cardiovascular diseases, characterized by high mortality. The degree of cardiovascular risk is significantly higher in the so-called abdominal (central or android) type of obesity. It has been established that with an increase in the body mass index by each unit, the risk of heart failure increases in men by 5%, and in women by 7% [1, 21, 23, 40,



93]. This is largely due to the fact that obesity increases the likelihood of developing arterial hypertension by 50%. According to the results of the Framingham study, every 4.5 kg of excess weight increases systolic blood pressure in men by 4.4 mm Hg, and in women by 4.2 mm Hg. The combination of obesity and arterial hypertension is characterized by higher morbidity and mortality from cardiovascular diseases. In obesity, the course of arterial hypertension is characterized by early damage to target organs - the heart and kidneys [1, 10, 17, 21, 23, 25, 27]. Obesity is often accompanied by the development of type 2 diabetes. A number of authors have identified a direct relationship between increased body weight and the risk of developing type 2 diabetes.

Thus, obesity of the 1st degree increases the risk of developing diabetes mellitus type 2 by 3 times, obesity of the 2nd degree – by 5 times, obesity of the 3rd degree – by 10 times [13, 17, 18, 32, 33]. Modern studies have shown that arterial hypertension and diabetes mellitus type 2 are two interrelated diseases that enhance each other's damaging effect, directed simultaneously at several target organs: kidneys, vessels of the heart, brain, retina, peripheral vessels of the lower extremities. Thus, diabetes mellitus type 2 increases the risk of developing ischemic heart disease by 2-4 times. As a rule, at the time of verification of the diagnosis of diabetes mellitus type 2, more than half of patients already suffer from ischemic heart disease, the course of which in many cases is asymptomatic. In this regard, with the development of acute coronary syndrome in patients with type 2 diabetes, mortality is 2-3 times higher [1,15,16,17,18,19].

Obesity is closely associated with the development of venous thromboembolic complications, so in people with a BMI of more than 25 kg / m², the risk of thrombosis increases by 1.7 times, with a BMI of more than 30 kg / m², the risk increases by 2.4 times, with a BMI of more than 40 kg / m² - more than 3 times [7, 99]. Currently, scientists and clinicians consider diseases associated with obesity in a complex. Back in 1990, metabolic disorders and obesity-associated diseases were combined into "metabolic syndrome" [1, 2, 3,25,26,27,28,29]. In Uzbekistan, the results of the study showed that 20.6% of people of working age have metabolic syndrome. With the development of metabolic syndrome, the risk of developing cardiovascular diseases increases twofold over the next 5-10 years, in addition, the risk of stroke increases 2-4 times, the risk of myocardial infarction increases 3-4 times. The risk of death from these complications increases twofold compared to patients without metabolic syndrome, regardless of the history of cardiovascular diseases. The prevalence of metabolic syndrome is 2 times higher than the prevalence of diabetes mellitus, and in the next 25 years its growth rate is expected to increase by 50% [1, 2]. In subsequent years, the concept of a single pathogenesis of the components of metabolic syndrome continued to be intensively studied, discovering new components. Therefore, liver steatosis and obstructive sleep apnea syndrome are proposed to be considered as components of metabolic syndrome [1,20,21,22,23,24,35]. The prevalence of various clinical forms of non-alcoholic fatty liver disease is significantly higher in obese patients than in the general population and, according to various studies, is 75-93%, with non-alcoholic steatohepatitis diagnosed in 18.5-26%, fibrosis in 20-37%, and cirrhosis in 9-10% of patients. Among patients with morbid obesity, the incidence of non-alcoholic fatty liver disease increases to 95-100% [1,2,9,10,11,12,13,14,34]. Obstructive sleep apnea syndrome is detected in 50-98% of obese people. This disease increases the risk of myocardial infarction, heart rhythm disturbances, and sudden death.



The aim of the study

Improving the results of surgical treatment of patients with morbid obesity.

Materials and methods

The present work is based on the analysis of the results of examination and treatment of 59 patients with morbid obesity, operated on using combined techniques, who were examined and hospitalized in the 1st surgical department of the Bukhara Regional Multidisciplinary Medical Center and the thoracoabdominal surgery department of the multidisciplinary clinic of the Tashkent Medical Academy for the period from 2021 to 2024. The patients' age ranged from 31 to 59 years. Among them, 18 were men, 41 were women.

Results and discussion

Based on a retrospective analysis of the use of each of the above-described scales and the specified indices, as well as clinical data, laboratory and instrumental research results, individual factors with the greatest prognostic significance in the development of complications of bariatric surgeries were identified in patients of the retrospective group. The set of factors with prognostic significance and their ratings were integrated into the "Bariatric Surgery Individual Risk Assessment Scale". Depending on the degree of clinical and statistical significance, each factor was assessed from 1 to 4 points. The criteria for the "Bariatric Surgery Individual Risk Assessment Scale" were selected based on existing risk assessment scales, as well as taking into account the analysis of the examination results of patients of the retrospective group. To assess the influence of a factor (for example, the presence of anemia), the risk ratio of complications (RRO) was calculated in patients with and without the factor. This indicator clearly reflected the significance of the factor for assessing the risk of complications, fluctuated between 0.00 and 4.76, high values (>2.00) were achieved in subgroups stratified by age, BMI, chronic kidney disease, liver dysfunction, anemia and long surgery. The patient's age at the time of surgery is considered a significant risk factor for complications according to the scales and indices: "Scaling the risk of mortality in bariatric surgery" (OS-MRS), "HAS-BLED" and "Charlson Comorbidity Index". According to the data obtained, the risk of complications differed in subgroups with different ages. Significant differences were found in patients aged 50-59 years (ORO 2.16). Considering the relative small number of observations in the subgroup of patients aged 60-69 years, the assignment of points was carried out taking into account the experience of using the "Bariatric Surgery Mortality Risk Assessment Scale" (cutoff value - 45 years), the "HAS-BLED" scale (cutoff value - 65 years) and the "Charlson Comorbidity Index" - 1 point for those over 40 years of age every 10 years. The body mass index is taken into account by the "Joseph A. Caprini Scale". In our sample, there was a relationship between the risk of complications and BMI, which reached pronounced values (ORO 2.62) in the subgroup with maximum BMI values of 65-69.9 kg / m². With BMI < 50 kg / m², no increase in the risk of complications was observed. Thus, the points of the "Bariatric Surgery Individual Risk Assessment Scale" are assigned as follows: 50-54.9 kg/m² - 1 point, 55-59.9 kg/m² - 2 points, 60-64.9 kg/m² - 3 points, 65-69.9 kg/m² - 4 points. The patient's gender is taken into account by the "Bariatric Surgery Mortality Risk Assessment Scale"



(OS-MRS). According to the obtained results, males had a fairly significant increase in the risk of complications compared to females (ORO 1.74 and 0.68, respectively). In this regard, in the "Bariatric Surgery Individual Risk Assessment Scale", males are assigned 2 points. In our sample, 96.5% of patients had abdominal obesity, thus, a direct effect of this factor on the risk of complications was not registered, however, the maximum values of the waist to hip ratio are associated with a significant increase in the duration of surgery ($p = 0.023$, Mann Whitney test). In addition, the combination of abdominal obesity is often associated with arterial hypertension, insulin resistance or diabetes mellitus, and is also an independent risk factor for cardiovascular events, so this factor was also taken into account to calculate the risk of complications (1 point). Hypertension is a known risk factor for cardiovascular events and is taken into account as a risk factor by the Bariatric Surgery Mortality Risk Assessment Scale and the HAS-BLED scale. According to our data, a slight increase in the risk of complications in the subgroup of patients with hypertension (ORO 0.80 and 1.05, respectively) was noted. Taking this into account and the experience of using other scales, this factor was taken into account when determining the risk of complications (1 point). Acute cerebrovascular accident or transient ischemic attack in the anamnesis occurred only in one patient, therefore, it was not possible to assess the influence of this factor on the risk of complications. However, given the severity of this condition, its presence in other known indices and scales: "Charlson Index", in the "Bariatric Surgery Individual Risk Assessment Scale" (OS-MRS), 2 points were assigned in the presence of this factor.

Atherosclerosis of the brachiocephalic arteries is a known risk factor for stroke and heart attack. Given that this condition is often associated with atherosclerotic lesions of other vessels (e.g. coronary arteries), the presence of this factor was taken into account as a risk factor for the development of postoperative cardiovascular complications. Given that in our sample the risk of complications was slightly higher in patients with and without atherosclerosis of the brachiocephalic arteries (ORO 1.08 and 0.85, respectively), the factor was assigned 1 point. Diabetes mellitus is a risk factor for atherosclerosis, cardiovascular events, arterial hypertension, and the development of infectious postoperative complications. This factor is taken into account by the Charlson Index. According to our data, the presence of diabetes mellitus significantly increased the risk of complications (ORO 1.46). The effect of diabetes mellitus on insulin therapy could not be assessed given the small number of patients in the subgroup, but the use of insulin for therapy is usually associated with a long history of hyperglycemia, as well as the presence of diabetic complications (nephropathy, polyneuropathy), therefore, in the presence of diabetes mellitus without insulin therapy, 1 point was assigned, and in the case of insulin therapy - 2 points. Stable angina and / or previous myocardial infarction is a known risk factor for myocardial infarction. Despite the small number of patients, according to our data, some increase in the risk of complications was noted in the subgroup of patients with stable angina or myocardial infarction in the anamnesis (ORO 0.97 and 1.74, respectively), this factor was taken into account when determining the risk of complications (2 points). Impaired liver function was defined as the presence of chronic viral hepatitis and/or liver cirrhosis and/or an increase of 3 times the upper limits of normal aspartate aminotransferase/alanine aminotransferase/alkaline phosphatase. These phenomena were associated with a very high risk of 70 complications (ORO 3.49), therefore, when compiling the scale, this factor was assigned 3 points. The presence of anemia is taken into account



in the HAS-BLED scale. According to our data, one of the highest ORO values (3.92) was achieved in patients with anemia. In this regard, when compiling the “Bariatric Surgery Individual Risk Assessment Scale”, 3 points were assigned accordingly in the presence of anemia. Another factor that significantly increased the risk of complications was a decrease in the glomerular filtration rate (SFR). Considering the severity of the risks, with an SCF of 75 - 31 ml / min / 1.73 m² and an SCF of 30 ml / min / 1.73 m², the ORO value is 2.24 and 2.62, respectively, in connection with this factor, 3 points and 4 points were assigned. The presence of a history of venous thromboembolic complications is taken into account by many scales (the OS-MRS Mortality Risk Assessment Scale and the Joseph A. Caprini Scale), and significantly increases the risk of complications according to our data (ORO 2.32), therefore, 3 points were assigned for this factor. Low functional activity of the patient affects the results of surgical treatment and the prognosis for the patient's life in general. According to the literature and our data, this factor influenced the risk of complications (ORO 0.75 and 1.11, respectively), therefore, it was assigned 2 points. The maximum differences in the ORR among the analyzed factors were achieved when analyzing the duration of surgical intervention (p=0.001, Fisher's exact test). The duration of surgery of 180 minutes or more was associated with a significant increase in the risk of complications, and the duration of 300 minutes or more - with the maximum. In this regard, when compiling the "Scale for assessing the individual risk of bariatric surgery", these parameters of the operation duration indicator were assigned 3 and 4 points, respectively.

Conclusions:

Thus, the developed “Scale for assessing the individual risk of bariatric surgery” has sufficient sensitivity and specificity to predict any complications, and can be used in clinical practice to predict and manage the risks of this type of surgical intervention.

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