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THE STATE OF CARBOHYDRATE AND LIPID METABOLISM IN OBESE PATIENTS AFTER BILIOPANCREATIC BYPASS SURGERY

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Summary. The paper presents material on the problem of surgical treatment of patients with severe forms of obesity. Based on factual material, an assessment is given of the methods of combined bariatric operations used by the authors.
Key words: obesity, obesity treatment, bariatric surgery, laparoscopic longitudinal resection of the stomach, bariatric surgery, sleeve gastrectomy, gastric bypass, longitudinal resection of the stomach in combination with small intestinal bypass.

Relevance. The prevalence of obesity has now reached epidemic proportions. According to data published in 2009 by the World Health Organization (WHO, International Obesity Task Force), about 2.1 billion people worldwide were overweight or obese. In Russia (WHO, 2010), 51.7% of women and 46.5% of men were overweight or obese, including morbid obesity [163]. According to analysts' forecasts, by 2025 the number of obese people in the world will almost double; 40% of men and 50% of women will suffer from this disease. [1,2]. Lifestyle changes in combination with drug therapy are the basis for the treatment of obesity and type 2 diabetes. However, according to the US National Institutes of Health, up to 60% of obese patients cannot maintain their body weight (BW) reduced by diet and exercise for a year, and after 5 years, the reduced BW returns to its original level in almost all of them. In morbid obesity (MO), the effectiveness of conservative therapy does not exceed 5-10% [1,2,6,8,10].

In recent decades, surgical methods for treating severe forms of obesity have become widely used throughout the world, and there is an obvious trend both towards an increase in the number of operations performed and towards an expansion of the number of countries where bariatric surgery is becoming increasingly widespread. The main goal of surgical treatment of obesity is to influence the course of associated diseases by significantly reducing BW, since only achieving optimal glycemic control and target parameters of lipid metabolism can prevent the development and progression of complications of T2DM, including CVD. The experience of using bariatric surgeries in patients with obesity combined with metabolic disorders and diseases has shown the significant potential of surgery in achieving compensation for type 2 diabetes mellitus that developed against the background of obesity. In 1978, Buchwald H. and Varco R. formulated the concept of “metabolic” surgery [1,4]. Some of the first works in this area were the publications of Pories W. et al. [1,23,24,25,26,27,28], which discussed the possibility of persistent compensation for type 2 diabetes mellitus in obese patients after gastric bypass surgery (GBS). Later, other authors, including Russian ones, also demonstrated an improvement in the course of type 2 diabetes mellitus after bariatric surgeries, the original purpose of which was to reduce BW [3,4,20,21,22].

Russian experience of using bariatric surgeries in patients with obesity and associated T2DM, as well as numerous publications [11,13,15] on the positive impact of bariatric surgeries on the

course of T2DM, determine the need for a thorough study of the mechanisms underlying the improvement of metabolic control in obese patients with various carbohydrate metabolism disorders, primarily with T2DM, after bariatric treatment.

It turned out that in most patients with obesity and T2DM or another carbohydrate metabolism disorder, normalization of glycemia occurs relatively quickly after bariatric surgery - long before clinically significant loss of BW. After bypass operations (BS, biliopancreatic diversion (BP)), normoglycemia, according to the literature, was restored in 84% - 98% of patients, and after restrictive ones - in 48% - 72% of patients [30 - 33]. A possible explanation for this is the phenomenon of the "incretin effect" identified in the 60s of the last century [1,2,6,8,10], a more pronounced stimulation of insulin secretion after oral administration of glucose compared to its intravenous infusion, leading to an identical increase in glycemia [1,4,29]. However, the mechanisms of the positive effect of bariatric operations on the parameters of metabolic control in patients with obesity and type 2 diabetes have not yet been fully studied, and the potential of their incretin-directed action has not been revealed.

However, despite good results in terms of weight loss, bariatric surgeries are associated with disruption of the physiologically balanced and holistic digestion process, and therefore are not without the development of a number of long-term metabolic complications.

Purpose of the study. To evaluate the effectiveness of BPSh in achieving long-term compensation of carbohydrate and lipid metabolism in patients with obesity and type 2 diabetes.

Materials and methods. This work is based on an analysis of the results of examination and treatment of 49 patients with various types of external hernias of the anterior abdominal wall, who were examined and inpatiently treated in the 1st surgical department of the Bukhara Regional Multidisciplinary Medical Center and the Department of Thoracoabdominal Surgery of the Multidisciplinary Clinic of the Tashkent Medical Academy for the period from 2011 to 2023 The analyzed material included women of reproductive age who planned to have children in the future. The control group consisted of all women with hernias of the anterior abdominal wall who underwent traditional hernial orifice repair without the use of allomaterial. The main group is all women with hernias of the anterior abdominal wall who underwent alloplasty according to our recommendations.

Research results and discussion. To study the state of carbohydrate and lipid metabolism before and after BPS in patients with obesity and type 2 diabetes mellitus, a retrospective analysis of case histories of patients operated on for obesity and concomitant diseases was performed in accordance with the objectives. Of the 70 patients included in the retrospective observation, there were 45 women (64%) and 25 men (36%) aged 28 to 60 years (median 46 [38.0; 51.0] years) with severe obesity (BMI from 35.0 to 68.0 kg/m², median 47.9 [43.9; 53.2] kg/m²) and type 2 diabetes mellitus, 43 people (61.4%) had arterial hypertension. Of the entire examined group, 22 patients (31%) were under 40 years of age before the operation, 48 patients (69%) were aged 40 to 60 years. Before surgery, 58 patients (83%) had MO: 33 patients (47%) had a BMI of 40.0-49.9 kg/m², 21 (30%) had a BMI of 50.0-59.9 kg/m², and 4 (6%) had more than 60 kg/m²; the rest (12 people, i.e. 17%) had stage II obesity. The duration of T2DM before surgery ranged from newly diagnosed to 15 years; the median for the group as a whole was 2.0 [0; 6.0] years. There were 30 patients (42.8%) with a disease duration of up to 1 year from diagnosis verification, 27 (38.6%) from 1 year to 10 years, and 13 patients (18.6%) with a disease duration of more than 10 years. Before the operation, only diet therapy for diabetes mellitus was administered to 28 patients (40%), in combination with OADs - 31 (44.3%), insulin therapy - 11 (15.7%). Of the group of

patients receiving OADs, 9 people took a drug from the biguanide group (metformin), 8 from the sulfonylurea group, 4 from the DPP-4 inhibitor group, 1 from the glinide group, 4 - a combination drug (biguanide + sulfonylurea), 5 - a combination drug (biguanide + DPP-4 inhibitor). Considering that the median age in the group as a whole was 46 [38.0; 51.0] years and the patients did not have severe complications of diabetes mellitus and/or risk of severe hypoglycemia, the following target levels were adopted [1]: HbA1c level < 7%, fasting glycemia < 7 mmol/l, TC < 4.5 mmol/l, LDL-C < 2.6 mmol/l, TG < 1.7 mmol/l, HDL-C > 1.0 mmol/l (in men) and > 1.2 mmol/l (in women). Before the operation, against the background of the conducted hypoglycemic therapy, 27 patients (39%) had target HbA1c values, fasting glycemia - only 17 (24%). That is, the vast majority of patients were in a state of chronic decompensation of carbohydrate metabolism: in 43 patients (61%) the HbA1c level was more than 7%, and in 8 (11%) – more than 10%.

Initially, 16 of 59 patients (27%) who did not receive insulin therapy were found to have fasting hyperinsulinemia and all (n = 59) had a high HOMA-IR insulin resistance index. Before the operation, there were no patients with a C-peptide level below the norm, the minimum recorded value was 1.3 ng/ml.

Before the operation, only 17 patients (24%) had the target values for this category of patients [1] for TC, 22 (31%) for LDL-C, 23 (32%) for TG, 10 (40%) for HDL-C among men and 10 (22%) among women. Thus, the vast majority of patients with obesity and type 2 diabetes before bariatric surgery, despite conservative therapy, did not achieve target indicators of carbohydrate (more than 60% of patients) and lipid metabolism (about 70% of patients).

Our results of long-term observation of patients with obesity combined with type 2 diabetes after BPS (a retrospective 5-year study) demonstrate the high efficiency of the operation in terms of reducing BW (by 42% from the initial value), continuing for 2 years after the operation, as well as the stability of the reduced BW during the subsequent observation period.

Conclusions:

1. Already 3 months after BPSH, patients with obesity and type 2 diabetes achieve satisfactory glycemic control and significant improvement in lipid metabolism parameters.
2. The vast majority of patients with obesity and type 2 diabetes experience partial and complete remission of type 2 diabetes after BPSH.

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