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## CARBOHYDRATE METABOLISM ACCORDING TO OBESITY PHENOTYPE

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**Abstract.** The article will determine the features of the clinical course, diagnosis of prediabetes and prognosis of the development of diabetes depending on the phenotype of obesity, which will make it possible to further optimize the diagnostic and therapeutic approach for this cohort of patients and prevent the change of the stage of "prediabetes" to manifest diabetes mellitus.

**Key words:** diabetes, obesity, insulinresistense, dyslipidemia.

### Introduction.

Diabetes mellitus is the most common disease of the 21st century. The main challenge for modern doctors is to prevent its development. All endocrinological associations of the world direct their work not only to good compensation for diabetes, but also to timely detection at the stage of prediabetes. There is an opinion that people with aggravated heredity, aged over 45 years, people with overweight who have concomitant dyslipidemia, hypertension (AH), gout are susceptible to diabetes, especially type 2. Yes, indeed, this is the main cohort of people, but on the case database we leave those patients who also have a significant risk of developing diabetes.

Research Group A. De Lorenzo (2016), developed a new classification of obesity, which evaluates not only the body mass index, but also the distribution and functional state of adipose tissue. This classification plays an important role in the screening of patients with impaired carbohydrate metabolism, because it well notes the role of insulin resistance in the launch of diabetes:

Phenotype I - metabolically healthy obesity at normal weight;

Phenotype II - metabolically unhealthy obesity at normal weight;

Phenotype III - metabolically healthy obesity;

Phenotype IV - metabolically unhealthy obesity;

**Purpose.**

Study the state of carbohydrate metabolism in individuals with different obesity phenotypes.

**Materials and methods.** We examined 96 individuals (18-64 y.) according to each obesity phenotype during 2019 - 2021 on the basis of the Vinnitsa Regional Clinical High-Specialized Endocrinological Center. An anamnesis was collected according to the FINDRISK Diabetes risk scale, an objective examination was carried out, body mass index (BMI), waist volume (WV) was determined. Glucose tolerance test was performed laboratory, glycosylated hemoglobin (HbA1c), creatinine, urea, ALT, AST, cholesterol (CL), triglycerides (TG), low-density lipoproteins (LDL) were determined. The fat distribution of the In-Body Test apparatus was examined instrumentally and the level of blood pressure was measured. All patients were assigned to 4 clinical groups, according to 4 obesity phenotypes.

**Results.**

Patients in the first clinical group have normal body weight, some have overweight (BMI -  $24.7 \pm 4.3$  kg/m<sup>2</sup>), but the waist volume (  $102.45 \pm 9.63$  cm in men,  $88.64 \pm 4.27$  cm in women) is higher than the normative values, which is tracked in all obesity phenotypes, which may indicate insulinresistance. Violations of carbohydrate (HbA1c -  $5.1 \pm 0.11\%$ ) and lipid exchanges (CL -  $4.71 \pm 0.36$  mmol/L, TG -  $0.88 \pm 0.33$  mmol/L, LDL -  $2.42 \pm 0.65$  mmol/L) according to screening surveys in this group were not found.

With normal body weight (BMI-  $23.7 \pm 2.44$  kg/m<sup>2</sup>), metabolic disorders are already observed in the second clinical group. In 8 patients, an increase in blood pressure (SAP -  $145.5 \pm 15.05$  mm Hg, DAP -  $85.0 \pm 8.42$  mm Hg). According to carbohydrate metabolism data, all patients were diagnosed with prediabetes combining fasting hyperglycemia and impaired glucose tolerance (fasting glucose -  $5.93 \pm 0.36$  mmol/L, 2 hours after glucose -  $8.45 \pm 0.27$  mmol/L, HbA1c -  $6.23 \pm 0.18\%$ ), and existing dyslipidemia (CL -  $5.88 \pm 0.26$  mmol/L).

It is worth noting that not always as we expect in obesity (BMI -  $34.57 \pm 3.31$  kg/m<sup>2</sup>) there will be changes in the lipid and carbohydrate profile, demonstrating the results of the examination of the 3rd clinical group (fasting glucose -  $5.23 \pm 0.17$  mmol/L, glucose 2 hours after glucose -  $7.4 \pm 0.32$  mmol/L, HbA1c -  $5.32 \pm 0.21\%$ ; CL -  $4.98 \pm 0.46$  mmol/L, TG -  $1.32 \pm 0.14$  mmol/L, LDL -  $2.75 \pm 0.22$  mmol/L).

In patients of the 4th clinical group, metabolic disorders were detected (fasting glucose -  $5.78 \pm 0.13$  mmol/L, glucose 2 hours after glucose -  $8.83 \pm 1.67$  mmol/L, HbA1c -  $5.97 \pm 0.32\%$ ; CL -  $6.73 \pm 0.21$  mmol/L, TG -  $2.46 \pm 0.57$  mmol/L, LDL -  $4.13 \pm 1.07$  mmol/L, SAP -  $145.58 \pm 19.34$  mm Hg, DAP -  $94.8 \pm 5.61$  mm Hg) with obesity (BMI -  $35.8 \pm 4.42$ ), waist volume (  $112,96 \pm 14.67$  cm in men,  $107.24 \pm 16.97$  cm in women) Given a long course without proper treatment, this can provoke diabetes mellitus. Having a complete characterization of each of the phenotypes, using the FINDRISK scale by the number of points scored, we can predict the development of diabetes in patients of each clinical group (Phenotype I - slightly increased, Phenotype II - moderate, Phenotypes III and IV - high risk of Diabetes). With all phenotypes, there is a significant risk of this pathology. And do not focus only on patients with severe obesity.

### **Summary and conclusions.**

Therefore, the determination of the main anthropometric indicators, the data of carbohydrate, lipid exchanges are the leading measures in early screening of precisely those patients who are in the so-called "gray zone" before diabetes. The results of the study will give rise to timely preventive measures aimed at combating diabetes mellitus.

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