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**INDICATORS OF CARBOHYDRATE AND LIPID METABOLISM IN PATIENTS WITH
CHRONIC OBSTRUCTIVE PULMONARY DISEASE WITH CONCOMITANT TYPE 2
DIABETES MELLITUS**

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It is known that chronic obstructive pulmonary disease (COPD) is characterized by the development of a systemic inflammatory process, which results in an increase of the incidence of comorbidities, including type 2 diabetes mellitus (type 2 diabetes). It has been proven that carbohydrate and lipid metabolism disorders are more common among patients with COPD, and this is not only due to the use of medications. Recently, the pathogenetic relationships of combined pathology have been actively researched, but the issues of diagnosis and treatment have not been fully studied.

The aim is to investigate the indicators of carbohydrate and lipid metabolism in patients with COPD combined with type 2 diabetes.

Materials and methods. 20 almost healthy people and 80 patients who were treated in the pulmonology department of the Regional Clinical Hospital Chernivtsi were examined. Patients were divided into two representative groups: 53 patients with COPD (first group) and 27 patients with COPD associated with type 2 diabetes (second group).

All patients met the inclusion and exclusion criteria of the study and signed an informed consent for the study. The diagnosis of COPD and type 2 diabetes was made in accordance with international guidelines. The study included patients with GOLD stage 2 and 3 and groups B and C. All patients underwent spirometry (spirograph "BTL 08 SpiroPro" (UK), bioimpedancemetry (portable device BC-601 (TANITA, Japan) and exercise tolerance test (6-minute walk). The BODE index was calculated by BMI, shortness of breath, FEV1 and 6-minute walk.

Analysis of carbohydrate metabolism showed an increased level of fasting glucose in patients with COPD with concomitant type 2 diabetes compared with almost healthy individuals and patients with COPD 1.6 times ($p < 0.05$). Levels of HbA1c, IRI and HOMA-IR index were probably higher in patients with COPD with concomitant type 2 diabetes than in patients in the control group and PZO (1.37; 1.9 and 3 times and 37.1%, in 1, 42, 2.6 and 4.3 times, respectively, $p < 0.05$).

The analysis of blood lipid spectrum revealed a high level of total cholesterol in patients with COPD with concomitant type 2 diabetes 1.6 times compared with PZO and 32.4% - in patients with COPD ($p < 0.05$). Patients in the main group had high levels of LDL CL (1.9 times and 33.0%) and low levels of HDL CL (47.6% and 34.9%, respectively) compared with PZO and patients with COPD. In the latter group, these indicators also differed from the control (LDL CL was 44.3% higher and HDL CL - 19.5% lower, $p < 0.05$). At the same time, the atherogenic index (IA) in patients with COPD with type 2 diabetes exceeded in patients with COPD and PZO by 2.45 and 4.8 times, respectively ($p < 0.05$).

Thus, in patients with COPD with type 2 diabetes there is a severe clinical course, lower FZD, changes in body composition (higher BMI, percentage of fat mass, visceral fat and decreased muscle mass), decreased exercise tolerance, increased fasting glucose and after 2 hours, glycosylated hemoglobin, IRI and HOMA-IR on the background of severe dyslipidemia (higher levels of CX, LDL CL, LDL CL, TG, IA at lower HDL CL).