INFLUENCE OF METABOLIC INFLAMMATORY MARKERS ON THE FORMATION OF DIABETIC CARDIOMYOPATHY IN OBESITY PATIENTS

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Rationale. Type 2 diabetes mellitus (DM-2) is directly involved in the pathogenesis of cardiovascular disease. Due to cardiomyotropic cytotoxic action, an important role in the development of myocardial pathology is played by the proinflammatory interleukin-1β (IL-1β). It leads to the activation of apoptosis of cardiomyocytes, weakens the contractile function of the heart muscle in vitro and in the cell culture, etc. The metabolic disorders characteristic of DM-2 lead to an increase in factors that can influence the development of myocardial pathology. One such marker of a pathological metabolic cascade is leptin. In patients with diabetes mellitus 2 and obesity, leptin can bind cardiovascular and metabolic disorders, as this hormone is the most important component of the hypothalamic-pituitary system's connection with adipose tissue.

Purpose. To determine the relationship between leptin and IL-1β on the formation of diabetic cardiomyopathy in patients with DM-2.

Methods and Material. Our work is part of the study of Department of Internal Medicine №3 and endocrinology of Kharkiv National Medical University "Diabetes mellitus and comorbid pathology". The analysis of the data of the survey of 82 patients with SD-2 with a body mass index of less than 29.9 kg / m2 with diabetes of 1 to 9 years of moderate severity was carried out. The control group consisted of 20 relatively healthy individuals who were comparable in age and gender. The levels of leptin and IL-1β were determined by the enzyme immunoassay. As markers of diabetic cardiomyopathy, the determination of echocardiographic (EchoCG) parameters was adopted. For this purpose, the maximum peak of diastolic filling during rapid filling of the left ventricle E, the maximum peak of diastolic filling of the left ventricle during systole of the left atrium A, and their relationship E/A, were determined.

Results. Comparing the level of leptin (ng/ml) in the control group and the group of patients, it was found that this level was significantly different - it was respectively 7.59±0.35 and 12.72±0.65 ($p \leq 0.05$). The level of IL-1β (pg/ml) was 10.59±0.27 in the group of patients and 8.12±0.24 ($p \leq 0.05$) in the control group, and differed significantly in the groups. When comparing EchoCG data, the E/A values in the two groups were significantly different: the E/A level in the control group was 1.4±0.075, and in the patient group - 0.94±0.03 ($p \leq 0.05$). which confirms the presence of cardiomyopathy. Correlation analysis between leptin and IL-1β revealed a relationship in the patient group ($R = 0.580$ ($p \leq 0.05$), whereas no correlations was found in the control group.

Conclusions. We believe that in patients with diabetes mellitus 2 and obesity, proinflammatory agents such as the proinflammatory IL-1β, as well as leptin, which has a multifaceted effect on the body and appear to have pro-inflammatory properties, make a significant contribution to the development of cardiac pathology, in particular, diabetic cardiomyopathy.

THE FEATURES OF HEPATIC VASCULAR BLOOD FLOW UNDER CONDITIONS OF NON-ALCOHOLIC FATTY LIVER DISEASE AND ITS RELATION TO CHRONIC SYSTEMIC INFLAMMATION

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Relevance. Non-alcoholic fatty liver disease (NAFLD) is a stage-based process that involves benign fatty liver infiltration (fatty hepatosis) with subsequent possible development of steatohepatitis, hepatocellular carcinoma and cirrhosis.

Purpose. The aim of the research was to study the status of blood flow in the portal vein (PV),
hepatic veins (HV), indicators of blood lipid spectrum and chronic systemic inflammation (CSI) in patients with NAFLD at the stage of fatty hepatosis and their relationship.

Materials and methods. We examined 110 patients of both sexes, aged 40-69 years, with NAFLD. 30 healthy individuals formed the control group. In patients' blood, we measured the level of total cholesterol (CS), low-density lipoprotein (LDL) cholesterol, tumor necrosis factor α (TNFα), interleukin-6 (IL-6), ceruloplasmin (CP) content, the expression level of mRNA gene of kappa B α inhibitor (IKBα) of nuclear transcription factor kappa B (NF-kB) in the mononuclear cells. The blood flow rate (v) in PV and HV was evaluated by impulse Doppler ultrasonography. Statistical data processing was performed using Pearson or Kendall correlation analysis.

Results. We found the increased levels of CS, LDL cholesterol, TNFα concentration (10.56+3.74 pg/ml) and IkBα mRNA gene expression (by 88.5%), which reflects the presence of dyslipidemia and the severity of CSI. Furthermore, we found the increased blood flow velocity in PV (v=0.38 m/s vs. v=0.23 m/s in healthy subjects), and in HV (v=0.20 m/s vs. v=0.15 m/s). A direct correlation was found between IkBα mRNA gene expression and TNFα content ($r= 0.365$, $p<0.05$) and IL-6 ($r=0.381$, $p<0.05$), confirming the activating role of NF-κB in CSI. The level of IkB mRNA expression was positively correlated with the level of CS and LDL cholesterol, reflecting the association between dyslipidemia and CSI. Blood flow velocity in PV was found to have a direct close correlation with IkB mRNA expression level ($r=0.597$, $p<0.001$) and IL-6
content ($r=0.534$, $p<0.001$). CP concentration had an inverse correlation with blood flow velocity in both PV ($r=0.403$, $p<0.05$) and HV ($r=0.353$, $p<0.05$). The increased blood flow velocities in PV and HV may be associated with the increased density of liver tissue in fatty hepatosis under conditions of CSI.

Conclusions. The obtained data demonstrate the relationship of CSI with dyslipidemia and increased blood flow rates in PV and HV in NAFLD. The results of the study enable us to recommend the use of blood flow velocities in PV and HV as a marker of the severity of CSI in this
pathology.