

TUMOR NECROSIS FACTOR- α AND INSULIN RESISTANCE IN PATIENTS WITH NONALCOHOLIC FATTY LIVER DISEASE IN COMBINATION WITH TYPE 2 DIABETES MELLITUS

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Tumor necrosis factor- α (TNF- α) is an adipokine that can cause the cytotoxic effects and stimulate the apoptosis, impairing liver function. There is a need in further study of TNF- α influence on liver cells properties and its role in the pathogenesis of nonalcoholic fatty liver disease (NAFLD) against a background of type 2 diabetes mellitus (DM-2) in patients with different trophological status.

Purpose. The study was designed to assess the relationship between the level of TNF- α and indices of carbohydrate metabolism in patients with NAFLD and its combination with DM-2 with different trophological status.

Subjects. The study was performed on 90 patients with isolated NAFLD and in combination with DM-2 with normal weight and obesity (body mass index ≥ 30 kg/m 2). All patients were divided into 3 groups: group 1 (n=20) comprised the patients with isolated NAFLD, group 2 (n=20) patients with combination of NAFLD and DM-2 with normal body weight and group 3 (n=50) patients with comorbid disorder and obesity. The controls (n=20) were apparently healthy individuals.

Methods. The study was carried out using the following methods: the level of serum fasting blood glucose (FBG) was determined by glucose oxidase method ("Diabetes-Test" kit), immunoreactive insulin (IRI) - by immunosorbent sandwich method («DRG» kit). HOMA-IR was calculated using the formula: HOMA = IRI \times FBG/22.5. The level of TNF- α was determined by immunoassay method ("Vector-Best" kit).

Results. The mean level of TNF- α was significantly ($p<0.001$) increased in all groups in comparison with the controls, where it was (24.2 ± 1.06 pkg/ml), the level was the highest in group 3 (96.6 ± 0.72 pkg/ml) and was significantly different from that in groups 1 and 2 (66.2 ± 1.07 pkg/ml and 86.4 ± 1.21 pkg/ml, respectively). In groups 1 and 2 the correlation was established between TNF- α and IRI ($r=0.33$, $p<0.05$ and $r=0.37$; $p<0.05$, respectively). In group 3 (with comorbid disorder and obesity) the significant correlation was established between the level of TNF- α and FBG ($r=0.46$; $p<0.05$), IRI ($r=0.78$; $p<0.05$) and HOMA-IR ($r=0.64$; $p<0.05$).

Conclusion. The present study demonstrates that correlation between TNF- α and indices of carbohydrate metabolism is connected with the ability of TNF- α to enhance the carbohydrate metabolism, insulin resistance, and support the role of TNF- α in pathogenesis of NAFLD, namely, in damage of hepatic gluconeogenesis, especially in patients with associated DM-2 and obesity. In addition, isolated NAFLD can independently cause the metabolic consequences.

Determination of TNF- α level can provide an opportunity to assess the risk of progression of carbohydrate metabolism disorders on an early stage.