

Correction of Diabetic Dyslipidemia in Patients with Ischemic Heart Disease and Type 2 Diabetes Mellitus

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Worldwide growing number of patients with type 2 diabetes mellitus (T2DM). In patients with T2DM cardiovascular risk increased 10 times compared with age-matched persons without diabetes. Such patients constitute a group of very high cardiovascular risk because 75% of death cases are due to cardiovascular disease. Prevalence of coronary artery disease (CAD) in patients with T2DM reaches 50-60%. However, in spite of current standards of medical care, including the achievement of target levels of low-density lipoprotein cholesterol (LDL), intensive control of blood pressure and glucose levels, patients with CHD with concomitant T2DM are at significant risk of macrovascular events and microvascular complications, which is primarily associated with the presence of atherogenic diabetic dyslipidemia, which is characterized by increased very LDL (VLDL) and related increase in triglycerides (TG), small dense LDL cholesterol (SDLDL) and lower high density lipoprotein cholesterol (HDL) levels.

Purpose: to investigate effects of combination therapy with fenofibrate and α -lipoic acid (ALA) on lipid metabolism and proinflammatory mediators in patients with CAD and T2DM.

Materials and methods. The study involved 40 patients with stable CAD, which were divided into 2 groups: Group 1 (n = 30) - patients with CAD combined with T2DM, Group 2 (n = 10) - patients with CAD without concomitant diabetes, which amounted group of comparison. Patients of group 1 were divided into 2 subgroups depending on the version of dyslipidemia correction and lipid metabolism disturbances: 1 subgroup - 15 patients who carried the standard therapy of CAD, subgroup 2 - 15 patients - the standard therapy of CAD with the inclusion of fenofibrate 145 mg once a day and ALA 600 mg 1 per day. Patients with CAD without concomitant diabetes also received standard therapy. Control group was 10 healthy age-matched volunteers. All patients were examined according to clinical protocols of care for patients with CAD and T2DM before treatment and after 2 months of therapy. We established indicators of lipid metabolism: total cholesterol, TG, LDL, VLDL, HDL by enzymatic colorimetric method; carbohydrate metabolism by determining fasting glucose using GOD-POD method, glycated hemoglobin (HbA1c) – by chromatographic methods, liver function by serum alanine transaminase (ALT) and aspartate transaminase (AST) levels, the levels of proinflammatory mediators (TNF- α , hsCRP) by ELISA method at baseline and in 2 months.

Results: The study found that among 1st group of patients dominated the presence of combined dyslipidemia, which is manifested in a reliable increase levels of total cholesterol, LDL, VLDL, TG, lowering HDL, while in patients with CAD without concomitant diabetes increased levels of total cholesterol, LDL ($p < 0,05$). In patients with CAD with concomitant T2DM was established correlation between level of LDL and HbA1c ($r = 0.31$, $P = 0.043$), between level of LDL and fasting glucose ($r = 0,76$, $p = 0,002$). After 2 months of treatment in all patients were seen lowering LDL by 12.2% and 13%, VLDL by 8.3% and 17%, TG by 7 and 16% in the 1st and 2nd groups respectively ($p < 0,05$). In 2nd subgroup in 2 months significantly increased levels of HDL by 14% ($P = 0.022$). Combination therapy with fenofibrate and ALA substantially lowered plasma levels of TNF- α by $6 \pm 1,5\%$ ($P < 0.05$) and hsCRP from 1.28 ± 0.13 to 0.92 ± 0.11 mg/l ($P < 0.05$) compared with the 1st group. There was no statistical difference between the levels of serum transaminases ALT and AST before treatment and after 2 months of therapy.

Conclusions: Implementation of combined therapy with the inclusion of fenofibrate and ALA significantly reduced proinflammatory mediators and improves control parameters of lipid metabolism in patients with CAD combined with T2DM.