Fibroblast growth factor 21, dyslipidemia in patients with coronary artery disease and concomitant obesity

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Recent studies have revealed that fibroblast growth factor 21 (FGF21) plays important role in energy metabolism regulation. FGF21 contributes to many age-related metabolic disorders, e.g. atherosclerosis, obesity, type 2 diabetes, and some cardiovascular diseases.

Purpose. To evaluate the lipid disorders and expression of fibroblast growth factor 21 in patients with coronary artery disease (CAD) and concomitant obesity.

Material and methods. 72 patients with CAD have been studied. All patients were divided into 2 groups: 1st group – patients with CAD with concomitant obesity (n=53), 2nd group – patients with CAD without obesity (n=19). The average age of the patients 1st group was 52.45±1.08 years, and of the 2nd group – 51.87±1.98; men – 52.9 %, women 47.1 % have been examined. The control group included 20 healthy persons. All participants underwent complex laboratory and instrumental cardiovascular assessment. Fibroblast growth factor 21 (FGF21) was measured by Elisa Kit using Aviscera Bioscience SK00145-01 (USA). The statistical analysis was conducted using Mann – Whitney, Spearman`s rank correlation.

Results. The level of FGF21 was 3-fold higher in patients with CAD and concomitant obesity 277.01 (185.63; 328.75) ng/l compared to the control group 109.3 (96.0; 116.6) $p<0.01$. The FGF21 level in the group with CAD without obesity was lower 221.68 (186.81; 231.5) ng/l that in the 1st group $p=0.038$, but higher that in the control group $p<0.01$. Total cholesterol 5.9 (5.65; 6.24) mmol/l, low density lipoprotein cholesterol 4.34 (4.09; 4.63) mmol/l and triglycerides 1.6 (1.4; 1.9) mmol/l in patients with CAD and concomitant obesity there were increased compared to the control group 4.6 (4.2; 4.8) mmol/l, 2.78 (2.41; 2.95) mmol/l, 0.81 (0.77; 0.9) mmol/l respectively $p<0.05$. FGF21 correlated with total cholesterol $r=0.407$, low density lipoprotein cholesterol $r=0.44$, triglycerides $r=-0.31$.

Conclusions. Our findings suggest that, FGF21 is associated with the level of dyslipidemia. It may be speculated that FGF21 related to the risk factor of coronary artery disease and may be considered an as independent marker of lipid metabolism impairment.

The lipid metabolism in depending on genotype of the gene of the tumor necrosis factor-α in patients with coronary artery disease and obesity

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The purpose – to examine the state of lipid metabolism in patients with coronary artery disease and obesity depending on the genotype polymorphism of the tumor necrosis factor-α (G-308A).

Material and methods. For the expression study and genomic investigation, fresh blood was obtained from 222, clinically and biochemically well-characterized patients with coronary artery disease and obesity (average age: 62.24±1.09 years). All 222 individuals underwent detailed clinical and biochemical investigation. The lipid metabolism such as high-density lipoproteins (HDL)-cholesterol, low-density lipoproteins (LDL)-cholesterol, total-cholesterol, triglycerides (TG) and genetic variants of the tumor necrosis factor-α (TNF-α), namely – 308G>A were investigated. The statistical processing of results was performed with the help of software package «Statistika» (StaSoft Inc, USA). The standard programme of correlation analysis with calculation of average arithmetic means was used: M+m, σ, and level of accuracy (p). Pearson correlation coefficient was applied to evaluate the interaction stage between the samples (r).

Results. The TG level in the group of patients with AA genotype of TNF-α gene was significantly higher at 30.80 % and 33.33 % than in patients with genotypes GA and GG, it was 2.37±0.08 mmol/L against 1.64±0.07 mmol/L and 1.58±0.09 mmol/L ($p<0.05$). We have not been established relationship between levels of HDL-cholesterol, LDL-cholesterol, total-cholesterol and genotype polymorphism of the gene of the TNF-α in patients with coronary artery disease and obesity ($p>0.05$).

Conclusions. Consequently, the leading feature of the lipid metabolism alteration in patients with coronary artery disease and obesity was a statistically significant hypertriglyceridemia, which was associated with the AA genotype of the G-308A polymorphism of the TNF-α gene.

Assessment of heart function in comorbid cardiorespiratory pathology

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Hypertensive disease (HD) and chronic obstructive pulmonary disease (COPD) are widespread diseases in mid and late adulthood, which are characterized by a chronic progressive course and require lifelong treatment. Comorbidity contributes to symptom burden and is associated with poor prognosis. The development of chronic heart failure, as an outcome of HD and complicated course of COPD, is a well-known phenomenon. However, there is still a lack of understanding about their common impact on the heart function.

The aim was to assess systolic and diastolic function of left (LV) and right (RV) ventricles in patients with HD and COPD.

Material and methods. The study included 73 patients with COPD with the level of bronchoobstruction more than 50 %. A study group was comprised of 42 patients with COPD and accompanying HD stage II without obvious symptoms of heart insufficiency. The comparison group involved 31 patients with COPD and no rising of blood pressure. The control group was formed from 23