ANALYSIS ASSOCIATION OF K121Q POLYMORPHISM *ENPP1* GENE FROM DEVELOPMENT OF HYPERTENSION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Actuality. Type 2 diabetes mellitus (T2DM) and hypertension are major health problems worldwide, associated with increased prevalence of obesity and excess morbidity and mortality. Furthermore, patients with hypertension having diabetes mellitus or obesity are more likely predisposed to target organ damage. Increasingly, in the general population there is a combination of arterial hypertension and type 2 diabetes mellitus. This combination pathogenetically substantiated by the presence of insulin resistance and hyperinsulinemia. Comorbidity hypertension and T2DM is often associated with the presence of other components of the cluster of metabolic abnormalities – dyslipidemia and central obesity, causes an increase in cases of morbidity of this disease. Due to the wide prevalence of hypertension in patients with type 2 diabetes, there is an interest to explore new genetic markers responsible for insulin resistance and high blood pressure level in its environment. T2DM and hypertension may share a common genetic background. Among these candidate genes, ectonucleotide pyrophosphate/phosphodiesterase 1 (*ENPP1*), also known as PC-1, is located on the long arm of chromosome 6 (6q23.2) and encodes for a protein which is one of the factors determining the insulin sensitivity. We investigated the role of IR-associated K121Q polymorphism (rs1044498) on hypertension in individuals with T2DM.

Materials and methods. Venous blood of 163 patients with T2DM and 110 healthy individuals (control group) was used for genotyping. Analysis of K121Q polymorphism *ENPP1* gene (rs1044498) was examined by PCR-RFLP with the following restriction fragment length analysis of the allocation of them

by electrophoresis in agarose gel. Statistical analysis was performed by using the software package SPSS-17. The value of $P<0.05$ was considered as significant.

Results. Analyzing the distribution of genotypes with or without hypertension in patients in both groups were found true association between hypertension and T2DM, regardless of genotype on K121Q polymorphism *ENPP1* gene ($P<0,001$). Value of individuals with K/K and K/Q + Q/Q genotype among patients with T2DM with normal values of blood pressure (BP) and hypertension were not significantly different ($P = 0.365$). There was no association of K121Q polymorphisms *ENPP1* gene investigated the development of type 2 diabetes mellitus as in patients with normal blood pressure values ($P=0.469$) and in patients who had hypertension ($P=0.499$). Established that both in healthy individuals ($P=0.307$) and in patients with T2DM ($P=0.365$), no significant association between K121Q polymorphism *ENPP1* gene and the development of hypertension. Analyzing blood pressure in comparison groups based on genotype variants on K121Q polymorphism *ENPP1* gene in patients with type 2 diabetes mellitus significant differences were found. Analysis of the comparison between the groups showed that patients with T2DM – homozygotes for the major allele (K/K) – had significantly higher rates all kinds of pressures (systolic, diastolic, pulse) than practically healthy person. Found that in patients with T2DM, carriers of the minor allele, the value of BP sys. and BP diast. significantly higher than the control group ($P<0.001$).

Conclusion. There is no association between K121Q polymorphism *ENPP1* gene and the development of hypertension in patients with type 2 diabetes. But based on the results established a link between hypertension and the development of T2DM regardless of genotype.