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# PARAMETERS OF DAILY BLOOD PRESSURE MONITORING AND SERUM LEVELS OF CHEMERIN AND NESFATIN-1 IN HYPERTENSIVE PATIENTS WITH OBESITY

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Hypertension and obesity both are key cardiovascular risk factors. Known mechanisms of combined impact of obesity and other major cardiovascular risk factors are still not clear, but the data of epidemiological and clinical studies indicate the leading role of adipokines (a group of cytokines produced by adipose tissue) in the onset and progression of cardiovascular complications in obese patients [ 1]. In this aspect, the recently discovered adipokines, chemerin and nesfatin-1, are of interest.

Chemerin is mainly synthesized in adipocytes and preadipocytes of perivascular and white adipose tissue, fibroblasts and platelets in the form of prochemerin. It has several active isoforms, which causes its pleiotropic effects, including prohypertensive action. A series of research has shown that chemerin has no effect on basal inflammatory status, but it promotes the production of nitric oxide and activates the PI3K-Akt-eNOS signaling pathway. The presence of endothelial dysfunction, which occurs in many cardiovascular diseases, increases the ability of chemerin to increase arterial tone, which causes the vasoconstrictor effect of this adipocytokine in the processes of vascular tone regulation and may contribute to the development of hypertension [2].

The main place of synthesis of nesfatin-1 is the hypothalamic nuclei. It is also synthesized in adipocytes, pancreatic beta cells, cells of gastric mucose and reproductive system. Nesfatin-1 is able to regulate the need for food, reduces the appetite and the amount of body fat produced, participates in the regulation of carbohydrate metabolism. Recent data suggests that nesfatin-1 is involved in the pathogenesis of hypertension, which is potentially implemented through the central

system of melanocortin and oxytocin, and also expresses vasoconstrictor effects by suppressing the synthesis of nitric oxide [3].

Aim: To study the relationship between serum levels of chemerin and nesfatin-1 and parameters of daily blood pressure monitoring (DBPM) in hypertensive patients depending on the presence and degree of obesity.

Material and methods. 82 patients with hypertension, aged 60 (55; 66) years, including 26 patients with overweight, 39 with obesity and 17 patients with normal body weight, undergone DBPM. The serum levels of chemerin and nenfatin-1 were determined by the immune enzyme method using Human Chemerin and Human Nesfatin-1 ELISA kits (Kono Biotech Co., Ltd., China). Statistical processing was performed using Mann-Whitney, Pearson criteria, K-mean cluster analysis. Quantitative attributes are presented as median (Me), upper (UQ) and lower (LQ) quartiles.

Results. Serum levels of chemerin and nesfatin-1 were significantly higher in patients with hypertension ($p = 0.001$) compared with healthy subjects. In order to detect the joint effect of the concentration of both cytokines on DBPM parameters, a cluster analysis was performed using the K-mean method; four non-intersecting clusters were obtained with a studying error $p = 0.138$. The inter-cluster analysis revealed statistically significant differences between clusters in the DBPM parameters that characterize the dynamics of changes of blood pressure in the morning, namely, the rate (HRSAT and SHPPAV) and the magnitude of the morning rise of BP (VRPSAT and VRPDAD), daytime systolic and diastolic variability of BP (VarSBP (D) and VarDBP (D)) and circadian rhythm of BP. The first cluster, where the high level of serum chemerin of 11.12 (8.2; 14.02) ng/ml was associated with high values of BMI (33.31 (30.47; 36.15) kg/m2) was characterized by the most unfavorable type of distribution of circadian rhythms of BP, VarSBP and VarDBP. In contrast, the patients of the 3rd cluster with high serum levels of both cytokines: chemerin of 7.7 (6.52; 8.44) ng/ml, nesfatin-1 of 8.96 (8.55; 9.37) ng/ml, and low BMI (25.2 (23.1; 26.8) kg/m2), had a predominant distribution of circadian rhythms of blood pressure by dipper type, but high SHPPSAT and SHPPDAT. The most

favorable in relation to the parameters of DBPM was the 2nd cluster with moderately low content of chemerin: 4.91 (4.42; 5.26) ng/ml and high level of nesfatin-1: 8.02 (7.67; 8.43) ng/ml. A significant direct correlation has been revealed between serum chemerin and the following parameters of DBPM: SHPPSAT and SHRPDAT: r = 0.35, p <0.05; VRPSAT and VRPDAT: r = 0,3, p <0,05; VarSBP and VarDBP: r = 0.34, p <0.05. There were no correlations between the parameters of DBPM and serum nesfatin-1.

Conclusions. Serum levels of chemerin and nesfatin-1 were significantly elevated in patients with hypertension. The relationship between serum chemerin and circadian rhythm, daytime variability of blood pressure and DBPM parameters that characterize the dynamics of morning changes of blood pressure was revealed. There was no convincing data on the effect of serum nesfatin-1 on DBPM indices.

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