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THE RELATIONSHIP BETWEEN VASPIN, TNF-A LEVELS AND THE PARAMETERS OF CARBOHYDRATE METABOLISM IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

Background. It is well known that the adipose tissue is an active endocrine organ. It produces a large number of substances which are involved in the regulation of metabolic and physiological processes. One of representatives is vaspin- adipokine, which is involved in some obesity-related disease states such as insulin resistance.

Aim. To determine the level of vaspin and TNF-α in blood of patients with type 2 diabetes mellitus (T2DM) depending on parameters of carbohydrate metabolism and body mass index (BMI).

Materials and methods. The study involved 31 patients (25 men) with T2DM. The following parameters have been assessed: BMI, HbA1c, immunoreactive insulin (IRI), HOMA-IR and fasting plasma glucose (FPG). The plasma level of vaspin and TNF-α were determined by ELISA. The control group included 10 healthy volunteers.

Results and Discussion. Examined patients had statistically significant deviations of the studied parameters in comparison with the control group. It was noted that the level of vaspin correlated with FPG ($r=0.62;p<0.01$), IRI($r=0.6;p<0.001$) and HOMA-IR($r=0.45; p<0.05$). These correlations can be estimated as a compensatory pathway in the development of insulin resistance (IR). Meanwhile the relationship between TNF-α and IRI($r=0.52; p<0.01$) can be a link in the development of IR. Correlation of HbA1c with TNF-α($r=0.32;p=0.04$) and vaspin ($r=0.56; p<0.01$) can also presume the influence of vaspin on parameters of long-term compensation. The study has revealed no significant correlation between vaspin and BMI($r=0.31;p=0.052$), however there was a relationship between vaspin and waist circumference ($r=0.49;p=0.01$). TNF-α had a significant correlation with BMI($r=0.35;p=0.029$) and WHR ($r=0.41;p=0.007$). T2DM is a multiple metabolic

disorder, which is able to interfere in the secretion of vaspin simultaneously in different ways, which can eliminate the effect of body mass on the level of vaspin in T2DM. Apparently, the level of vaspin is more likely to be associated with carbohydrate metabolism disorders rather than with increase of body weight. The study obtained a statistically significant correlation between the duration of T2DM and vaspin ($r=-0.35;p=0.02$) and statistically insignificant correlation between T2DM and TNF-α($r=-0,06$; $p=0,067$). Inflammation and IR, induced by excessive fat mass, may increase the serum vaspin concentration, therefore, the relationship between vaspin and TNF-α($r=0.53$; $p<0.01$) is noteworthy. The anti-inflammatory effect of vaspin requires more detailed studies. Significant gender and age differences in the concentrations of vaspin and TNF- α were not found.

Conclusion. The obtained data suggest that vaspin and TNF-α can influence carbohydrate metabolism or at least, they can serve as biomarkers of metabolic disorders. Therefore, further research is needed to determine whether vaspin plays an important role in the development of T2DM or if it is a biomarker that improves insulin sensitivity and has anti-inflammatory action.