Level of erythropoietin, sVCAM-1 and VEGF in blood of obese adolescents

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Introduction. Erythropoietin is considered as a protective tissue cytokine that increases angiogenesis. Obesity is associated with the development endothelial dysfunction, playing a key role in the pathogenesis of metabolic syndrome complications.

Objective. To determine the level of erythropoietin and presence of markers of endothelial cell dysfunction sVCAM-1 and VEGF-A in the blood of adolescents with obesity.

Methods. We examined 22 teenagers with obesity (body mass index — BMI — from 30.1 to 42.87) and 22 teenagers with normal BMI. The age of patients ranged from 13 to 18 years (average of 14.25 ± 1.2). We analyzed serum concentrations of vascular cell adhesion molecule 1 (sVCAM-1) and vascular endothelial growth factor A VEGF-A — markers that indicate the presence of endothelial dysfunction. Data was analyzed with the use of statistical package Statistica 10.0 for Windows-10. The significance of the differences was determined at P value < 0.05.

Results. Concentration of sVCAM-1 (1395.23 ± 264.73 ng/ml vs 847.44 ± 190.23 ng/ml; $p < 0.0001$) and VEGF-A (75.89 ± 54.79 pg/ml vs 6.22 ± 5.74 pg/ml; $p < 0.0001$) was higher in patients with obesity compared to the adolescents with the normal BMI. The correlation between the level of sVCAM-1 and BMI ($r = 0,45$; $p < 0,05$).

Erythropoietin level in obese children was lower than in children with normal BMI (17,24 ± 10.9 and 36,31 ± 31,41; $p < 0,001$), a negative correlation between BMI and erythropoietin level ($r = -0.26$; $p < 0,05$).

Obese children revealed a negative correlation between the level of sVCAM-1 and the level of erythropoietin in the blood serum ($r = 0,48$; $p < 0,05$).

Conclusion. Obesity in adolescents characterized by decreased erythropoietin and increased level of endothelial dysfunction markers sVCAM-1 more than 2 times, VEGF-A — more than 12 times compared to adolescents with a normal BMI. Evaluation of the protective role of erythropoietin in the prevention of endothelial dysfunction and its complications is necessary.