MARKERS OF ENDOTHELIAL DYSFUNCTION IN CHILDREN WITH OBESITY

Liudmila Alekseevna Firsova[1], Nina Viktorovna Evdokimova[1], Valeria Pavlovna Novikova[1], Alevtina Alekseevna Pokhlebkina[2], Yuriy Valentinovich Petrenko[1], Olga Petrovna Gurina[1], Alexandr Evgenievich Blinov[1], Olga Nikolaevna Varlamova[1]

[1] Saint-Petersburg State Pediatric Medical University. 2 Litovskaya str., Saint-Petersburg, Russia, 194100

[2] «AVA PETER» LLC. Liteyny Ave., 55a, litera A, room 3-N com. 31, fl. 1, Saint-Petersburg, Russia, 191014

E-mail: ludmila.firsova@list.ru

KEY WORDS: children; obesity; endothelial dysfunction.

Background and Aims. Vascular endothelium plays an important role in regulation of blood pressure and blood flow by continuous vascular tone modulation which is carried out with vasoactive substances. Obesity in children is associated with an increased risk of arterial hypertension (AH).

The aim of this research is to determine the endothelial cells dysfunction markers, such as endothelin-1 (ET-1), serum concentration of vascular cell adhesion molecule (sVCAM-1), vascular endothelial growth factor (VEGF-A) and homocysteine in obese adolescents.

Materials and Methods. Clinical, laboratory and instrumental examination of 60 children aged 12-17 years with obesity and 20 children without obesity was carried out.

Results. Obesity in 35% of children was accompanied by AH. The concentration of ET-1 in obese children was 18.5 [4;33] pg/ml, in children with normal body mass — 1 [0;2] pg/ml ($p < 0.0001$). sVCAM-1 level — 1274 [1020;1528] ng/ml against 822 [661;983] ng/ml ($p < 0.0001$); VEGF-A 74 [22;96] pg/ml against 6 [1;11] pg/ml ($p < 0.0001$); homocysteine — 27.5 [16;39] mmol/l against 4.5 [0;9] mmol/l in group 2.

Conclusions. Endothelial dysfunction was detected in 72% of obese adolescents. The level of ET-1 in adolescents with obesity was 18 times higher than in adolescents with a normal body mass index, sVCAM-1 — 2 times higher, VEGF-A — 12 times higher, homocysteine — 6.5 times higher respectively. The determination of vascular endothelial dysfunction markers in patients with obesity is important for identifying the risk of AH on early stages.