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Epicardial obesity as a significant predictor of leptino and insulin resistance

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Leptino (LR) and insulin resistance (IR) are significant predictors of atherosclerosis, thrombosis, type 2 diabetes. The effect of epicardial obesity (EO) (as a type of visceral obesity) on the formation of LR and IR is studied.

Objective: To study the effect of EO on the formation of LR and IR among men with arterial hypertension (AH).

Materials and methods: The study included 130 men 49.5 ± 4.3 years old, with AH of 1-3 degrees and the absence of clinical manifestations of coronary heart disease and atherosclerosis of other localizations, type 2 diabetes with a BMI of 20-35 kg/m2 and abdominal obesity according to WC = 94 cm. Patients were divided into two groups depending on the thickness of epicardial adipose tissue (EAT), measured behind the free wall of the right ventricle by echocardiography. Group 1 consisted of 60 patients with epicardial obesity (EAT=7 mm), group 2 included 70 patients without epicardial obesity (EAT<7 mm). All subjects assessed indicators of LR and IR: measured levels of serum leptin (SL), soluble receptors for leptin (SLR), free leptin index (FLI), calculated as the ratio SL / SLR (as the only currently existing marker LR); IR was estimated by calculating the HOMA-IR index. IR was diagnosed with the generally accepted HOMA-IR index> 2.7.

Results: When comparing LR indices in the studied groups, higher average values of SL, FLI were observed in the group with EO (EAT=7 mm) than in the group without EO (EAT<7 mm): (SL = 32.16 ng/ml (26.7; 37.62) versus SL = 14.92 ng/ml (11.62; 18.22), p = 0.01, respectively); (FLI = 1.67 (0.47; 2.87) versus FLI = 0.37 (0.28; 0.46), p = 0.01, respectively). Also in the EO group, higher indices of the HOMA-IR index were observed compared with the group without EO: (2.16 (1.62; 2.66) versus 1.35 (1.06; 1.64), p = 0.01, respectively). When conducting the correlation analysis between FLI (as a marker of LR) and various obesity indicators (BMI, WC, EO) in the studied groups, a significant positive correlation relationship between FLI and EO was found in both the first and second groups (r = 0.67, p = 0.01; r = 0.62, p = 0.01, respectively). The IR index HOMA-IR also significantly positively correlated with EO in the group with a EAT =7 mm (r = 0.68, p= 0.01). BMI and WC did not correlate with FLI, IR in both groups 1 and 2 (p>0.05). In the EO group, 11 patients had IR with a HOMA-IR index> 2.7. Using the linear regression analysis, the regression equation was obtained and the value of EO was calculated, from which the IR with HOMA-IR > 2.7 started to be determined. This figure was 9.5 mm.

Conclusions: EO (EAT =7 mm) is a significant predictor of LR and IR, unlike the generally accepted criteria for obesity (BMI, WC). A EAT = 9.5 mm can be a significant predictor of the development of type 2 diabetes, so these patients need additional examinations.