Hemodynamic and metabolic disorders in obese patients with resistant hypertension

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Resistant hypertension (RH) is an important cause of cardiovascular morbidity and mortality. Both true and pseudo-resistant arterial hypertension (AH) represent a big problem not only in blood pressure (BP) control, but also in those possible adverse cardiovascular events, the development of which is associated with failure to achieve target BP levels.

The aim of the study was to establish the features of hemodynamic and metabolic parameters in obese patients with true and pseudo-resistant AH.

Material and methods: The study included 200 patients with uncontrolled AH and obesity. Patients were initially prescribed dual antihypertensive therapy. Those patients who did not reach target BP levels after 3 months on dual therapy were additionally assigned a third antihypertensive drug. Of the 98 patients who were assigned triple therapy, 48 patients did not reach target BP (27 patients had pseudo-resistant and 21 patients had true resistant AH). These patients were additionally prescribed a fourth antihypertensive drug (spironolactone). The effectiveness of the treatment was evaluated 6 months after the start of antihypertensive therapy.

Results: After 6 months of therapy, patients with RH had higher body mass index (BMI) and higher BP levels compared to patients without this condition. Patients with RH also had more pronounced cardiovascular remodeling, higher levels of triglycerides, insulin, HbA1c, more pronounced insulin resistant (IR), which was confirmed by greater HOMA-IR, greater imbalance of adipokines, proinflamation activity and higher activity of the renin-angiotensin-aldosterone system (RAAS). A comparative assessment of pseudo-resistance and true resistance showed that patients with true resistance differed from pseudo-resistant patients with significantly lower BMI (p=0.02). In addition, in the absence of differences in BP levels, cardiovascular remodeling, lipid and carbohydrate profiles, patients with true resistance had significantly higher levels of aldosterone (p=0.04), higher activity of oxidative stress (malonic dialdehyde, p=0.01 and diene conjugates, p=0.03), a lower level of total antioxidant protection (p=0.00), a higher level of adiponectin (p=0.00), and a lower level of leptin (p=0.00), compared with pseudo-resistant patients.

Conclusions: Patients with resistant hypertension differed from hypertensive obese patients without resistance with higher BMI and BP, higher levels of triglycerides, insulin, HbA1c, more pronounced IR, cardiovascular remodeling, imbalance of oxidative stress - antioxidant protection system, higher proinflammatory and RAAS activity. Patients with true resistance differed from pseudo-resistant patients with significantly lower BMI, higher aldosterone levels, more pronounced imbalance of the system of oxidative stress - antioxidant protection and less pronounced adipokines imbalance.