

IMPACT OF OBESITY AND HYPERCHOLESTEROLEMIA ON CARDIAC REMODELLING IN PATIENTS WITH CARDIOVASCULAR DISEASES

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Background. The overweight and obesity have become a global medical problem in the modern world mainly due to acceleration of cardiovascular diseases. Early aging is associated with progression of atherosclerosis which arises from metabolic abnormalities and eventually leads to down-regulation of coronary circulation and to impaired vascular tonus.

Objectives: to investigate relations between obesity, plasma cholesterol level and structural changes of the heart in patients with combined ischemic heart disease and arterial hypertension (AH).

Material and methods: 35 patients (24 males and 11 females) with long-standing ischemic heart disease and arterial hypertension were enrolled in the study. The average age of patients was 54.2 ± 8.1 years. All patients underwent routine clinical examinations including anthropometry, office blood pressure (BP) measurement, echocardiography and measurement of fasting total cholesterol (TC) in blood plasma. Left ventricular myocardial mass (LVMM) was calculated by Penn Convention formula. Indexation of LVMM was made by height in 2.7 power. Left atrium diameter (LAD) was measured in anterior-posterior direction. During investigation all patients received conventional anti-ischemic and anti-hypertensive treatment.

Results: Any significant correlations between BP in treated patients and characteristics of cardiac remodeling were not found. Meanwhile, average BP correlated significantly with BMI ($r=0.51$, $p=0.002$) and TC ($r=0.59$, $p<0.001$). Moreover, increased BMI wasn't associated with specific changes in the heart structure except LAD ($r=0.61$, $p<0.001$), and LAD itself correlated positively with LVMM index^{2,7} ($r=0.72$, $p<0.001$) and negatively with ejection fraction of left ventricle ($r=-0.49$, $p=0.003$). Interestingly, that age of patients correlated only with diameter of ascending aorta ($r=0.46$, $p=0.06$) which increasing is probably associated with pronounced atherosclerosis. Sex of patients had impact on few values. Compare to females in this study males had higher height (173.7 ± 4.3 vs. 167.0 ± 4.4 cm, $p<0.001$) and diameter of ascending aorta (35.1 ± 4.9 vs. 31.4 ± 4.1 mm, $p<0.001$).

Conclusion. AH is more resistant for conventional treatment if associated with obesity and hypercholesterolemia. Increasing of BMI is related to specific type of cardiac remodeling - namely - enlargement of left atrium (known marker of pronounced diastolic dysfunction). Large left atrium is often combined with left ventricular hypertrophy and systolic dysfunction. Finally, diameter of ascending aorta is more likely increased in males and in elderly age.