

Noninvasive indicators of arterial stiffness in patients with coronary artery disease and type 2 diabetes mellitus

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In patients with type 2 diabetes mellitus (T2DM) increased cardiovascular risk. It is still relevant search noninvasive methods for early diagnosis of atherosclerotic vascular lesions and arterial stiffness in patients with T2DM and coronary artery disease (CAD).

Aims: To assess noninvasive indicators of arterial stiffness (AS) in patients with coronary artery disease (CAD) and concomitant type 2 diabetes mellitus (T2DM).

Methods: We examined 64 patients with CAD (19 males, age 60.5 ± 4.7 years). All patients with CAD were divided into 2 groups: the 1st (n=32) – patients with concomitant T2DM, the 2nd (n=30) - patients without T2DM. Baseline characteristics of patients included history of CAD (7.2 ± 2.3 years), T2DM (4.7 ± 0.5 years). The level of HbA1c was less than 7.5%. We conducted coronary angiography, ultrasound of the carotid arteries with determination of intima-media thickness (IMT) of the common carotid artery (CCA), AS was measured as carotid-femoral pulse wave velocity (cf-PWV) on the rheovasography, ankle-brachial index (ABI) was evaluated by the ratio of the systolic blood pressure on the leg and arm in all patients.

Results: According to coronary angiography among 1st group of patients in 75% cases registered atherosclerotic lesion of two or more coronary arteries (CA), in the 2nd group at 70% cases registered atherosclerotic lesion of one CA ($p < 0.05$). IMT-CCA values were significantly higher in the 1st group of patients compared with the 2nd group (1.38 ± 0.12 vs 1.12 ± 0.11 , $p < 0.05$). cf-PWV and ABI value also were significantly higher in the 1st group 9.31 ± 1.54 vs 7.58 ± 0.97 m/s and 1.49 ± 0.08 vs 1.13 ± 0.09 respectively. There were correlations between cf-PWV and IMT-CCA ($r=0.41$, $P=0.043$), cf-PWV and ABI ($r=0.32$, $P=0.039$), IMT-CCA and ABI ($r=0.39$, $P=0.037$). There were registered correlation between cf-PWV and extent of coronary atherosclerosis ($r=0.31$, $P=0.044$). And also there were registered correlation between IMT-CCA and extent of coronary atherosclerosis ($r=0.32$, $P=0.045$).

Conclusion: Determination of noninvasive indicators of arterial stiffness, such as cf-PWV, IMT-CCA and ABI, are necessary in the routine clinical practice for the early diagnosis and prevention of vascular complications, including coronary atherosclerosis in patients with type 2 diabetes mellitus.