374
Impact of acute hyperhomocysteinemia on coronary flow reserve in healthy adults.
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Background: Hyperhomocysteinemia has been related to preclinical structural and functional arterial abnormalities. Aim of the present study was to evaluate the impact of hyperhomocysteinemia on coronary flow reserve.

Methods: Twenty healthy subjects (mean age 41 ± 7 years) were studied twice, before and after methionine load (100 mg/kg) or placebo, according to a crossover, double blind design. Homocysteine levels were measured by liquid chromatography and coronary flow reserve was evaluated by transthoracic echocardiography.

Results: After methionine load, homocysteine levels increased from 10.7 ± 2.8 micromol/L to 30.4 ± 5.1 micromol/L (p < 0.0001) and coronary flow reserve decreased from 4.1 ± 0.49 to 2.3 ± 0.3 (p < 0.001). Coronary flow reserve was inversely related to post-load homocysteine levels (r = -0.21). After placebo, there was no significant change in coronary flow reserve.

Conclusion: In healthy adults, acute hyperhomocysteinemia was associated to a significant reduction in coronary flow reserve.

379
Myocardial inotropic reserve is associated with coronary flow reserve in patients with dilated cardiomyopathy. A pilot study.
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Background: Coronary flow reserve (CFR) has been shown to be diminished in patients (pts) with idiopathic dilated cardiomyopathy (IDC) and have been proposed as a predictor of poor prognosis in those patients (pts). Myocardial inotropic reserve represents also a prognostic index and has been hypothesized that is related to CFR.

Purpose: To assess coronary microvascular function in patients with angina pectoris without epicardial coronary artery stenosis.

Methods: Twenty-two patients with stable angina pectoris but without angiographic evidence of coronary artery stenosis and 20 controls entered the study. Angina pectoris was associated to ECG changes during acute event and/or positive treadmill maximal exercise test while inducible myocardial ischemia at dipyridamole (Dip) SPECT was not considered as inclusion criterion. Patients were excluded for diabetes mellitus, arterial hypertension, valvular heart disease, heart failure, primitive and familial cardiomyopathies and use of cardiac drugs. Transhoracic standard echocardiography and color-guided, second harmonic Doppler analysis of coronary flow velocities in distal left anterior descending artery were performed in the same morning. Coronary flow reserve (CFR) was measured as the ratio of coronary flow diastolic peak velocity after Dip infusion (0.56 mg/kg I.V. in 4) to resting coronary diastolic peak velocity.

Results: The 2 groups were comparable for age, body mass index, heart rate (HR) and blood pressure (BP). Standard echocardiography showed no difference in left ventricular mass index and ejection fraction. By analysis of coronary flow, resting diastolic peak velocity was higher (p < 0.01) and Dip-induced, hyperemic diastolic peak velocity lower (p < 0.01) in patients with angina. Thus, CFR was reduced in patients with angina (1.80 ± 0.7) in comparison with controls (2.70 ± 0.3) (p < 0.0001), even after adjusting resting and Dip flow velocities for the respective mean BP (p < 0.01). Only in the group of patients with angina, a negative relation was found between the double product (HR x systolic BP) measured after Dip infusion and CFR (r = -0.62, p < 0.01).

Conclusions: In patients with angina pectoris but no coronary stenosis CFR is impaired in relation to elevated resting coronary flow velocities and reduced hyperemic velocities and also to an increased myocardial oxygen consumption during low-dose Dip infusion. The alteration of coronary microvascular function, whose CFR is a reliable marker in absence of epicardial coronary stenosis, is a possible determinant of myocardial ischemia in this set of patients.

380
Angina pectoris caused by reduced coronary vasodilator reserve in patients without stenosis of coronary arteries.
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Purpose: To assess coronary microvascular function in patients with angina pectoris without epicardial coronary artery stenosis.

Methods: Twenty-two patients with stable angina pectoris but without angiographic evidence of coronary artery stenosis and 20 controls entered the study. Angina pectoris was associated to ECG changes during acute event and/or positive treadmill maximal exercise test while inducible myocardial ischemia at dipyridamole (Dip) SPECT was not considered as inclusion criterion. Patients were excluded for diabetes mellitus, arterial hypertension, valvular heart disease, heart failure, primitive and familial cardiomyopathies and use of cardiac drugs. Transhoracic standard echocardiography and color-guided, second harmonic Doppler analysis of coronary flow velocities in distal left anterior descending artery were performed in the same morning. Coronary flow reserve (CFR) was measured as the ratio of coronary flow diastolic peak velocity after Dip infusion (0.56 mg/kg I.V. in 4) to resting coronary diastolic peak velocity.

Results: The 2 groups were comparable for age, body mass index, heart rate (HR) and blood pressure (BP). Standard echocardiography showed no difference in left ventricular mass index and ejection fraction. By analysis of coronary flow, resting diastolic peak velocity was higher (p < 0.01) and Dip-induced, hyperemic diastolic peak velocity lower (p < 0.01) in patients with angina. Thus, CFR was reduced in patients with angina (1.80 ± 0.7) in comparison with controls (2.70 ± 0.3) (p < 0.0001), even after adjusting resting and Dip flow velocities for the respective mean BP (p < 0.01). Only in the group of patients with angina, a negative relation was found between the double product (HR x systolic BP) measured after Dip infusion and CFR (r = -0.62, p < 0.01).

Conclusions: In patients with angina pectoris but no coronary stenosis CFR is impaired in relation to elevated resting coronary flow velocities and reduced hyperemic velocities and also to an increased myocardial oxygen consumption during low-dose Dip infusion. The alteration of coronary microvascular function, whose CFR is a reliable marker in absence of epicardial coronary stenosis, is a possible determinant of myocardial ischemia in this set of patients.