The cumulative effect of risk factors on endothelial dysfunction in patients with chest pain and normal coronary angiogram


Background: patients with chest pain but normal coronary angiography often have both reduced coronary circulation and impaired systemic endothelial function. The aim of the study was to assess the effect of risk factors on systemic endothelial function in patients with chest pain but without hemodynamically significant coronary lesions.

Patients and Methods: In 90 patients (54 males, mean age 57±10 years) with a normal coronary angiogram the flow-mediated dilatation (FMD) was assessed by measuring the change in brachial artery diameter in response to hyperemic flow by vascular ultrasound. Hypercholesterolemia, hypertension and diabetes mellitus were considered as risk factors. Student's t-test and the logistic regression model was used to establish the effect of the risk factors on FMD.

Results: FMD was significantly lower in patients with hypertension (0.8±2.0 vs 9.0±2.4; p<0.01), diabetes mellitus (5.1±1.3 vs 9.0±4.0; p<0.01), and hypercholesterolemia (7.0±2.8 vs 9.0±4.0; p<0.05).

Using the logistic regression model, diabetes mellitus emerged as the most important risk factor damaging the endothelial response to the FMD, followed by hypertension. Patients with hypertension had significantly higher FMD than patients with all 3 risk factors (10.3±4.8 vs 5.1±2.6; p<0.01).

Conclusion: usual cardiac risk factors have a cumulative effect on endothelial dysfunction which can be detected by FMD in patients with negative coronary angiogram.

Mitrail annular calcification and aortic valve calcification: relationship with carotid intima media thickness and carotid dissection sensitivity

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Background: Mitrail (MAC) and aortic annular calcification (AVC) are observed more frequently in the elderly and represent a progressive degenerative process. Alterations in vascular structure and function, including increased arterial wall thickness (increased intima-media thickness, IMT), and increased arterial wall stiffness or reduced distensibility (DST), are also increasingly recognized as significant independent predictors of adverse cardiovascular outcomes. We undertook a cross-sectional study to examine the association between degree of calcification at mitral and/or aortic valve annulus and large artery structure (thickness) and function (distensibility).

Methods: We evaluated 145 consecutive patients who underwent transthoracic echocardiography and carotid artery echo Doppler for various indications. The following variables were measured: systemic blood pressure (BP), pulse pressure (PP), BP, body mass index (BMI) (kg/m²), total, HDL, LDL cholesterol, triglycerides, cIMT, cDST (C = (CCAsD - CCAdD)/PP)/CCAsD, where CCAsD and CCAdD were respectively systolic and diastolic common carotid artery diameters). Patients were classified according to a grading of valvular/annular lesions with independent scores based on echo density: 1 = annular/valvular sclerosis/calcification abroad; 2 = annular/valvular sclerosis; 3 = annular calcification; 4 = annular-valvular calcification, 5 = valvular calcification with no impact on the leaflets. The resulting patient score was the highest observed.

Results: Mean cIMT increased linearly with increasing of valvular calcification score, ranging from 1.4±1.8 mm in controls to 13.8±1.3 mm in subjects with score 5 (p<0.001). Mean cDST showed decreasing values from score 1 to 5, ranging from 147.8±23.9 to 50.5±17.5 (p<0.001). In the first to fourth quartile of cIMT values, respective maximal percent of scores were: score 1 77.4%, score 2 50.0%, score 4 51.5% and score 5 71.1% (p<0.001). Percentages of cIMT score 1 were more represented in the first quartile of cDST (46.7%), while score 5 were 59.4% in the fourth quartile (p<0.001), the remnant two quartiles showed a lower but more represented in the first quartile of cDIST (46.7%), while score 5 were 59.4% in the fourth quartile (p<0.001); the remnant two quartiles showed a lower but more represented in the first quartile of cDIST (46.7%), while score 5 were 59.4% in the fourth quartile (p<0.001; 10.3±4.8 vs 5.1±2.6; p<0.01).

Conclusion: usual cardiac risk factors have a cumulative effect on endothelial dysfunction which can be detected by FMD in patients with negative coronary angiogram.

Effect of weight loss with orlistat on aortic stiffness

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Aim: Obesity has reached epidemic levels and carries a risk for cardiovascular disease. Obesity may also be associated with early vascular changes. The aim of this study was to assess the effect of weight loss with orlistat on aortic stiffness in obese patients.

Methods: Study groups were composed of 18 (3 men and 15 women, mean age 50±6 years) obese participants. Aortic stiffness was assessed by transthoracic echocardiography at baseline and six months later after weight loss with orlistat. Aortic stiffness and compliance were determined in the same day from Doppler measurements of the aortic diameters measured by transthoracic echocardiography and blood pressure was obtained by sphygmomanometry.

Results: Values showed a significant differences between the two period in body mass index. Stiffness, aortic compliance and beta index. A significant decrease was noted in body mass index (37±5 vs 33±5 kg/m², p<0.001) and in beta index (22±11 vs 25±5, p<0.001). A significant increase was noted in aortic compliance. 0.62±0.01 vs 0.94±0.02, p<0.01 and in aortic strain 4.5±0.3% vs 7.1±3.2%, p<0.011.

Conclusion: These data show strong associations between weight loss and arterial stiffness regression. Six months treatment with orlistat and weight loss improves aortic stiffness. These data greatly underscore the vascular benefit of weight loss.

Interrelationship between non-invasive predictors of atherosclerosis: coronary flow reserve, flow mediated dilation, carotid intima-media thickness, aortic elasticity


Background: Several noninvasive methods have been introduced into research area to assess atherosclerosis in its proximal stages. In this study we have conducted to correlate between transthoracic coronary flow reserve (CFR) and well established surrogates of coronary atherosclerosis.

The study was conducted on totally healthy 136 subjects (53 male and 83 female, mean ages 33.4±7.3) of coronary risk factors. Using transthoracic echocardiography, aortic stiffness index (AoSI), aortic distensibility (AoD) and aortic elastic modulus (AoEM), using high-resolution ultrasound, brachial artery endothelium-dependent dilation (EID) and endothelium independent dilation (EID) and carotid intima-media thickness (IMT), and transthoracic echocardiographic coronary flow reserve (CFR) in left anterior descending coronary artery (LAD) were recorded from each subject.

Results: All of the parameters significantly correlated with each other except (EID). CFR significantly correlated with brachial EDD (r=0.302, P<0.001), carotid IMT (r=0.412, P<0.001), brachial artery resting diameter (BAD) (r=0.356, P<0.001), AoSI (r=0.298, P<0.001), AoD (r=0.310, P<0.001), and AoEM (r=0.312, P<0.001).

Carotid IMT significantly correlated with brachial EDD (r=0.388, P<0.001). BAD