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Comparison of aortic and carotid arterial stiffness parameters in patients with verified coronary artery disease.

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Source

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Abstract

BACKGROUND:

Arterial stiffness parameters are commonly used to determine the development of atherosclerotic disease. The independent predictive value of aortic stiffness has been demonstrated for coronary events.

HYPOTHESIS:

The aim of our study was to compare regional and local arterial functional parameters measured by 2 different noninvasive methods in patients with verified coronary artery disease (CAD). We also compared and contrasted these stiffness parameters to the coronary SYNTAX score in patients who had undergone coronary angiography.

METHODS:

In this study, 125 CAD patients were involved, and similar noninvasive measurements were performed on 125 healthy subjects. The regional velocity of the aortic pulse wave (PWV_{ao}) was measured by a novel oscillometric device, and the common carotid artery was studied by a

Doppler echo-tracking system to determine the local carotid pulse wave velocity (PWV_{car}). The augmentation index (AIx), which varies proportionately with the resistance of the small arteries, was recorded simultaneously.

RESULTS:

In the CAD group, the PWV_{ao} and aortic augmentation index (AIx_{ao}) values increased significantly (10.1 ± 2.3 m/sec and $34.2\% \pm 14.6\%$) compared to the control group (9.6 ± 1.5 m/sec and $30.9\% \pm 12\%$; $P < 0.05$). We observed similar significant increases in the local stiffness parameters (PWV_{car} and carotid augmentation index [AIx_{car}]) in patients with verified CAD. Further, we found a strong correlation for PWV and AIx values that were measured with the Arteriograph and those obtained using the echo-tracking method ($r = 0.57$, $P < 0.001$ for PWV; and $r = 0.65$, $P < 0.001$ for AIx values).

CONCLUSIONS:

Our results indicate that local and regional arterial stiffness parameters provide similar information on impaired arterial stiffening in patients with verified CAD.