

A Superiority of Arterial Stiffness Index Over Pulse Wave Velocity and Ankle Brachial Index for the Evaluation of Arterial Stiffness

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ABSTRACT

BACKGROUND Although pulse wave velocity (PWV) is widely used to provide a quantitative measure of arterial stiffness, it is affected by blood pressure level at the time of measurement, which is clearly a drawback of this method. We compared arterial stiffness index (ASI), PWV, and ankle brachial index (ABI) in the measurement of arterial stiffness in relation to hypertension and age.

METHODS Data relative to 175 subjects were analyzed: mean age 66 years, and BP 135/78 mmHg. ASI was obtained directly through computerized oscillometry. Those receiving and not receiving antihypertensives were classified as HT (n = 104) and non-HT (n = 71) groups, respectively, irrespective of BP at the time of study.

RESULTS After adjusting for age, SBP, and pulse pressure (PP), ASI (OR 1.006, 95% CI 1.001-1.011, p = 0.0236), but not PWV and ABI, was significantly related to HT. ASI was strongly correlated with PP ($\beta = 0.674$, p < 0.0001); however, PWV was strongly correlated with SBP ($\beta = 0.642$, p < 0.0001). ABI was not correlated with SBP. ASI and PWV significantly increased with age, but ABI did not change with age. When ASI and PWV were plotted as a function of age, the regression line was significantly steeper in the HT group than in the non-HT group only for ASI.

CONCLUSIONS Acceleration of age-related increase in arterial stiffness in HT subjects was detectable by ASI, but not by PWV and ABI. Thus, ASI may be the most sensitive noninvasive measure of arterial stiffness among currently available methods.

KEY WORDS: arterial stiffness index; pulse wave velocity; ankle brachial index.