

 HYPERTENSION, LIPIDS AND PREVENTION

PULSATILE VERSUS STEADY COMPONENTS OF BLOOD PRESSURE AND THEIR RELATIONS WITH AORTIC STIFFNESS: A BONE TO PICK?

ACC Poster Contributions
 Georgia World Congress Center, Hall B5
 Tuesday, March 16, 2010, 9:30 a.m.-10:30 a.m.

Session Title: Hypertension and the artery wall
 Abstract Category: Hypertension
 Presentation Number: 1237-88

Authors: *Panagiotis Xaplanteris, Charalambos Vlachopoulos, Gregory Vyssoulis, Ioanna Dima, Katerina Baou, Konstantinos Aznaouridis, Dimitrios Terentes-Printzios, Aikaterini Siana, Christodoulos Stefanadis, 1st Cardiology Department, Athens Medical School, Hippokration Hospital, Athens, Greece*

Background: The pulsatile component of blood pressure (BP) is implicated in atherosclerosis. Aortic stiffness, measured by pulse wave velocity (PWV), reflects changes in aortic structure and predicts outcomes. We explored relations of pulsatility, and mean blood pressure (MBP) (the steady component of BP) with aortic stiffness.

Methods: 1,125 newly diagnosed, never treated hypertensives enrolled in the study. Peripheral BPs were determined by mercury sphygmomanometer; central BPs and cPWV were calculated non-invasively by validated devices (SphygmoCor®, and Complior®). MBP was calculated by integrating the aortic pulse waveform. BP pulsatility was defined as pulse pressure (PP) divided by MBP. Spearman's correlation coefficients were calculated.

Results: PWV correlated with pulsatility ($r=0.390$, $p<0.01$); so did MBP ($r=0.798$, $p<0.01$). MBP explained a larger percentage of PWV variance than pulsatility (coefficients of determination: $r^2=0.64$ and $r^2=0.15$ respectively).

Conclusion: The pulsatile component of BP correlates with PWV. Cyclic strain on aortic wall that promotes arteriosclerosis and subsequent stiffening may be implicated as a pathophysiological mechanism. MBP, the steady component of BP, however, correlates stronger with PWV in never-treated hypertensives, indicating that elevated levels of BP per se, rather than relative changes in BP from diastole to systole, drive aortic stiffening.

Baseline characteristics of the study population

	Mean (±SD)		Mean (±SD)
Age, y	52.9±11.7	Peripheral systolic BP, mmHg	150.3±18.1
Men, no. (%)	728 (59.4)	Peripheral diastolic BP, mmHg	89.5±10.8
Smokers, n (%)	509 (41.6)	Peripheral pulse pressure, mmHg	60.7±15.6
BMI, kg/m ²	28.3±4.5	Central systolic BP, mmHg	138.9±17.7
Diabetes, no. (%)	72 (5.9)	Central diastolic BP, mmHg	90.6±11.2
eGFR, mL/min/1.73 m ²	82±17.5	Central pulse pressure, mmHg	48.3±14.7
PWV, m/sec	8.16±1.58	Mean blood pressure, mmHg	110.8±13.2
Pulsatility	0.44±0.12		