

Is 24 hour central aortic pressure superior to single measurement of central aortic pressure in well controlled hypertensive patients

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Background: Non-invasive measurements of 24 h ambulatory central aortic systolic pressure (24hCASP) is now feasible method than single measurement of CASP. There is growing interest in CASP as cardiovascular risk marker beyond conventional brachial blood pressure (BP). Pulse wave velocity estimates arterial stiffness, whereas CASP is representative of the BP in major organs.

Purpose: To evaluate non-invasive parameters for arterial stiffness using oscillometric method and to compare 24hCASP with single measurement of CASP in well-controlled hypertensive patients to detect target organ damage (TOD).

Methods: A total 95 patients (57±14 years) with hypertension, were separated in two groups: 22 patients with normal EA/Ees ratio (Arterial elastance (EA) and ventricular elastance (Ees)) and 73 hypertensive patients with decrease EA/Ees ratio, marker for ventriculo-arterial coupling. EA and Ees were calculated as $\frac{\text{end-systolic pressure}}{\text{stroke volume}}$ and

$\frac{\text{end-systolic pressure}}{\text{end-systolic volume}}$. Parameters for arterial stiffness – 24hCASP, ambulatory central systolic pressure (CASP), 24-hour pulse wave velocity (PWV24h) and ambulatory PWV were measured non-invasively with oscillometric method by Mobil-O-graph PWA.

Results: Statistically significant differences in parameters of vascular stiffness were found in patients with normal ventriculo-arterial coupling in comparison with disturbed EA/Ees: 24hCASP (107.64±9.19 vs. 116.64±16.7 mm Hg, $p=0.02$), CAP (117.45±9.26 vs. 128.42±16.15 mm Hg, $p<0.0001$). There were no statistically significant differences in PWV and PWV24h. Multiple regression analysis demonstrated that CAP ($B=-0.264$ $p=0.003$; 95% CI: $-0.003-0.014$) is independent predictor of TOD in hypertensive patients, than 24 hour central aortic pressure.

Conclusion: There is no superiority of 24hCASP than single measurement of CASP. CASP could predict preclinical damage and cardiovascular outcome.