

Pressure-dependence of arterial stiffness: potential clinical implications

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PRESSURE-DEPENDENCE OF ARTERIAL STIFFNESS: POTENTIAL CLINICAL IMPLICATIONS

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SUPPLEMENTAL DIGITAL CONTENT 1. POTENTIAL WHITE-COAT EFFECT ON ARTERIAL STIFFNESS MEASUREMENTS

Introduction

It is well known that the white-coat effect can cause office blood pressures (BPs) to show higher values than a patient's actual BP as measured using ambulatory BP measurement [1]. As pulse wave velocity (PWV) is dependent on BP, the white-coat effect potentially also has an influence on measured PWVs. In this supplemental digital content (SDC), we will assess the white-coat effect of BP on PWV.

Methods

Baseline modeled P-A curves were used to calculate cPWV_{mod} values for ambulatory BP values. These values were used to assess the white-coat effect on arterial stiffness measurements.

Results

Table SDC1 shows for both age-groups the differences in cPWV as measured during the study and the calculated cPWV_{mod}, based on ambulatory BP values and the (individual) baseline P-A curves. A roughly similar 1 m/s difference in stiffness linked to a

10 mmHg difference between night-time ambulatory and study DBP was noted, corroborating the pressure-dependence rate described above.

Discussion

Our analysis of the white-coat effect on arterial stiffness measurements showed a similar 1 m/s difference in stiffness linked to a 10 mmHg difference between mean ambulatory and study DBP. It should be noted (1) that for the young the effect was smaller than in the older group and (2) that in our white-coat PWV illustration, only the BP effect is included [2], whereas it is known that the white coat effect may also increase vessel tone [3, 4], which would increase PWV beyond the mere BP effect. Schillaci et al. established the effect of white-coat hypertension on (office) arterial stiffness measurements, using a statistical approach at clinical population level [5]. They concluded that stiffness values should be adjusted based on the office versus ambulatory BP difference. This, however, is only possible at individual patient level either using our model-based approach or using a 1 m/s per 10 mmHg thumb-rule.

Table SDC1. Potential white-coat effect on arterial stiffness measurements

	BP-lowered patients							
	age <50 yrs				age >50 yrs			
	study baseline (n=6)	ambulatory (n=6)			study baseline (n=6*)	ambulatory (n=6*)		
		day	mean	night		day	mean	night
SBP mmHg	149 ± 17	143 ± 17	137 ± 16	124 ± 14	164 ± 22	147 ± 14	142 ± 14	133 ± 18
DBP mmHg	95 ± 12	99 ± 10	93 ± 10	80 ± 10	92 ± 5	94 ± 12	89 ± 11	80 ± 13
PP mmHg	54 ± 4	44 ± 10	44 ± 8	44 ± 5	72 ± 22	53 ± 11	53 ± 11	53 ± 11
cPWV m/s	8.4 ± 1.2				12.0 ± 2.4			
cPWVmod m/s		8.4 ± 1.2	8.1 ± 1.2	7.5 ± 1.2		11.6 ± 1.9	11.4 ± 2.0	10.9 ± 2.2

Mean \pm SD. *For one subject, ambulatory data were unavailable. BP, blood pressure; SBP and DBP, systolic and diastolic blood pressures; PP, pulse pressure; cPWV, carotid pulse wave velocity; cPWVmod, cPWV calculated from baseline, study *P-A* relationship and ambulatory blood pressures.

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