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](#_ENREF_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 $cPWVmod $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 $cPWVmod$, 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](#_ENREF_2)], whereas it is known that the white coat effect may also increase vessel tone [[3](#_ENREF_3), [4](#_ENREF_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](#_ENREF_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.

## References

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