Adjustment for blood pressure when measuring pulse wave velocity in newly diagnosed untreated hypertensive patients

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Aim

To investigate if mean arterial pressure (MAP) was superiorly correlated to pulse wave velocity (PWV) compared to systolic blood pressure (sysBP) in newly diagnosed untreated hypertension.

Background

PWV:

- A valid and well-documented predictor of cardiovascular risk in hypertensive patients
- Age and blood pressure (BP) modulate the level of PWV
- Essential to adjust for these potential confounders
- SysBP has been widely used for adjustment

Laurent S et al. Aortic stiffness is an independent predictor of all-cause and cardiovascular mortality in hypertensive patients Hypertension 2001; 37: 1236-1241

- In recent years, MAP has been favoured

Determinants of pulse wave velocity in healthy people and in the presence of cardiovascular risk factors: "establishing normal and reference values". Eur Heart Jour 2010; 31: 2338-2350

Methods

- 126 newly diagnosed untreated hypertensive patients
- Recruited at the general practitioners' office in the municipality of Aalborg, Denmark

BP:

- 24h ambulatory BP measurements

PWV:

- Applanation tonometry with the Sphygmocor device

Results

Table I:

Baseline characteristics

n	126
Female (n)	67 (53%)
Age (years)	50 [26;73]
Smoking (n)	23 (18%)
Diabetes mellitus (n)	3 (2%)
Body mass index (kg/m ²)	27 [19;41]
Systolic BP (mmHg)	145 [121;186]
Diastolic BP (mmHg)	89 [62;122]
Mean arterial pressure (mmHg)	107 [89; 145]
Heart rate (min ⁻¹)	73 [48; 113]
PWV (m/s)	8.5 [5.3; 16.8]

Table II:

Correlation between PWV and age

	β coefficient	p
Age	.09	<.0001

Figure I

Correlation between PWV and MAP

Figure II

Correlation between PWV and sysBP

- Steiger's test for equal correlation shows that despite numeric and graphic differences in correlation coefficients the correlations are not statistically different (p=.2)

Conclusion

- PWV measurements must be adjusted for age as well as BP
- Adjusting for sysBP may be superior to adjusting for MAP in newly diagnosed untreated hypertensive patients
- Both numerically and graphically the correlation coefficients are different but can not reach statistically different levels

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