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P86 Can Central Blood Pressure be Accurately Estimated in Individuals with and Without Systolic Blood Pressure Amplification?

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ABSTRACT

Introduction: Systolic blood pressure (SBP) does not always amplify from central to peripheral arteries. Individuals without SBP amplification (SBPamp) have higher aortic blood pressure (BP) despite similar brachial cuff SBP. To circumvent this discrepancy, the aim of this study was to determine if aortic SBP can be accurately estimated non-invasively in patients with and without SBPamp.

Methods: Patients undergoing percutaneous coronary intervention were recruited. Individuals with atrial fibrillation, ≥10 mmHg between-arm SBP difference or severe aortic stenosis were excluded. Aortic and brachial intra-arterial BP were measured using a fluid-filled catheter. Simultaneously, brachial and central cuff BP were measured in triplicate (Mobil-o-Graph, IEM, Germany). Central BP was estimated by pulse wave analysis with Type I (SBP and diastolic BP) and Type II (mean and diastolic BP) calibrations. Aortic-to-brachial SBPamp was defined as ≥5 mmHg increase between intra-arterial aortic and brachial SBP.

Results: Of the 151 patients recruited, only 85 had SBPamp. SBPamp+ and SBPamp− patients had similar brachial cuff SBP (126 +/− 15 vs 126 +/− 16 mmHg, p = 0.8) and clinical characteristics, apart from lower augmentation index in SBPamp+ (18 +/− 10 vs 22 +/− 11, p = 0.03). Central BP estimated with Type I or Type II calibration could not accurately determine aortic SBPs in both phenotypes (Table 1). Using the mean of both estimates only provided a slightly better accuracy.

Conclusion: Central BP measurements cannot accurately identify the different aortic BP of the SBPamp phenotypes. A new central BP calibration may be needed to circumvent this problem.

Table 1

Baseline characteristics	SBPamp+ (n = 85)	SBPamp− (n = 66)	p-value
Male sex	74%	74%	1.0
Age	66 ± 11	65 ± 9	0.6
Height (cm)	171 ± 10	170 ± 10	0.6
BMI (kg/m^2)	29 ± 6	30 ± 10	0.3
Active smoking	28%	27%	0.9
Diabetes	19%	17%	0.7
Hypertension	59%	55%	0.6
Dyslipidemia	55%	55%	0.9
Prior cardiovascular disease	39%	52%	0.1
eGFR (mL/min/1.73 m^2)	80 ± 18	81 ± 18	0.7
Brachial cuff SBP	126 ± 15	126 ± 16	0.8
Brachial cuff diastolic blood pressure	78 ± 9	78 ± 12	0.9
Heart rate (bpm)	67 ± 11	65 ± 11	0.3
Augmentation index @ 75 bmp	18 ± 10	22 ± 11	0.03
Pulse wave velocity (m/s)	10 ± 2	9 ± 2	0.09

SBPamp+ and SBPamp− denotes individuals with and without SBP amplification, defined as ≥5 mmHg increase between intra-arterial aortic and brachial SBP. Values are expressed as mean ± standard deviation. All blood pressure measures are expressed in mmHg. p-values are calculated using Pearson's chi-square and Student t-tests. SBP, systolic blood pressure.

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