



Conference Abstract

P.37 An Assessment of Potential Sources of Error that May Arise in the Measurement of Carotid-Femoral Pulse Wave Velocity

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Keywords

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ABSTRACT

Objectives: Carotid-femoral pulse wave velocity (cfPWV) approximates aortic stiffness and is a predictor of cardiovascular events. Despite the literature highlighting the clinical relevance of cfPWV, there is minimal integration of this parameter in clinical assessments. An underlying reason may stem from potential measurement errors. This paper investigates the potential sources of error in the measurement of cfPWV.

Methods: Participants ($n = 15$, age 30 ± 15 years, 12 female) had supine cfPWV measured using the SphygmoCor XCEL device. Sources of error investigated included: 1) operator experience; 2) poor carotid waveform acquisition; 3) low placement of the leg cuff; and 4) tape measurement of distance. True cfPWV was obtained by averaging twenty cfPWV measurements (regression to the mean). Comparisons were made with regression analysis and Bland-Altman plots.

Results: All cfPWV measurements, for both the experienced and less experienced operator, were within ± 0.5 m/s of the true cfPWV when three (but not two) measurements were averaged. cfPWV acquired with a poor carotid waveform and lower placed leg cuff did not significantly differ from the measured cfPWV ($p > 0.05$), however, there were some physiological meaningful errors (cfPWV error $> \pm 0.5$ m/s). Excluding four distance measurements, three of which made by the same operator for a single individual, all distance measurements were within 5% of the true distance.

Conclusions: Irrespective of the operators' experience, with good cuff placement and carotid waveform acquisition, three measurements quantifies cfPWV accurately. Measurement error should not be a factor in the lack of clinical uptake of cfPWV.

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