



P17 Comparisons of Carotid-femoral Pulse Wave Velocity Obtained from the Surface-distance Measurement and from the Population-derived Distance Formula: Associations with Macro- and Microvascular Alterations in Older Adults

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ABSTRACT

Introduction: Inaccurate determination of arterial path-length by surface-distance (SD) measurement is an inherent source of error in calculating carotid-femoral pulse wave velocity (CFPWV). A recent development in calculating arterial path-length by a simple distance formula (DF) for CFPWV has been shown to not only remove intercentre measurement variability but also strengthen the association between CFPWV and traditional cardiovascular risk factors [1]. We determined whether the association of macro- and microvascular alterations with CFPWV derived from the distance formula (CFPWV-DF) would be stronger than that with CFPWV derived from the surface-distance measurement (CFPWV-SD).

Methods: CFPWV-DF and CFPWV-SD were obtained from 489 older adults (67.2 ± 8.8 yrs, 154 F, 244 CVD). Macrovascular [carotid lumen diameter (LD), carotid inter-adventitial diameter (IAD), carotid intima-media thickness (IMT), carotid total plaque area, and ankle-brachial pressure index] and microvascular [reactive hyperaemia index and urinary albumin-creatinine ratio (UACR)] parameters were also obtained.

Results: CFPWV-DF was significantly lower than CFPWV-SD (9.27 ± 2.38 vs 9.88 ± 2.55 m/s, $p < 0.001$), which resulted from a longer arterial path-length estimated by SD than DF (495.4 ± 44.8 vs 465.3 ± 20.6 mm, $p < 0.001$). The significant associations observed between CFPWV-SD and LD ($r = 0.264$), IAD ($r = 0.303$), and IMT ($r = 0.165$) were similarly observed between CFPWV-DF and LD ($r = 0.253$), IAD ($r = 0.303$), and IMT ($r = 0.183$, all $p < 0.001$). This was also the case with UACR ($r = 0.163$ and $r = 0.141$, both $p = 0.001$). Other parameters did not show any association in either CFPWV.

Conclusion: The association of macro- and microvascular alterations with CFPWV-DF was not stronger than that with CFPWV-SD, suggesting that arterial path-length determination methods may not influence interactions between vascular biomarkers and CFPWV.

REFERENCE

- [1] Weir-McCall JR, Brown L, Summersgill J, Talarczyk P, Bonnici-Mallia M, Chin SC, et al. Development and validation of a path length calculation for carotid-femoral pulse wave velocity measurement: A TASCFORCE, SUMMIT, and caerphilly collaborative venture. *Hypertension* 2018;71:937-45.

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