Determination of Travel Distance for Noninvasive Measurement of Pulse Wave Velocity: Case Closed?

To the Editor:

Carotid-femoral pulse wave velocity (cfPWV) is currently considered the gold-standard measurement for arterial stiffness.\(^1\) In clinical routine, noninvasive assessment is the only feasible method, whereas, for research purposes, catheter-based invasive determination, as well as MRI, may play a role. Precise determination of the distance traveled by the pulse wave is easily feasible with the latter 2 methods but has been a matter of debate for noninvasive techniques for the last few years.\(^1\) Therefore, we are pleased to find that absolute values for aortic pulse wave velocity, measured using MRI, were in good agreement with absolute cfPWV values, obtained by state-of-the-art noninvasive devices, in the study by Joly et al.\(^2\) Of note, pulse wave travel distance for noninvasive cfPWV assessment was measured by subtracting the distance from the carotid location to the suprasternal notch from the distance between this notch and the femoral site of measurement. This is in agreement with our recent invasive study\(^3\) in a similar age group (55.7 versus 60.3 years), where the same approach to travel distance estimation provided the closest similarity with invasive aortic pulse wave velocity, as measured during catheter withdrawal from the ascending aorta to the bifurcation. In contrast, the widely used method of direct carotid-femoral distance measurement resulted in an overestimation of cfPWV of 2 to 3 m/sec\(^3,4\) in comparison with invasive studies. We conclude that, for the purpose of standardization and comparability between different noninvasive devices, the method of subtracting the distance from the carotid location to the suprasternal notch from the distance between the suprasternal notch and the femoral site of measurement should be recommended for noninvasive cfPWV measurement. This would bring values into line with original\(^5\) and earlier methods\(^6\) which measured distance “in the line of wave travel” between recording sites.

Disclosures

M.F.O. is a funding director of AtCor medical, manufacturer of systems for pulse wave analysis and measurement of pulse wave velocity.


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