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P153 Radial-finger Pulse Wave Velocity as a Measure of Microvascular Stiffness: Feasibility and Response to Nitroglycerin

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ABSTRACT

Background/Objectives: We previously demonstrated a different regional stiffness response of elastic and muscular arteries after the administration of nitroglycerin, leading to an alteration of aortic-brachial stiffness gradient. Regional stiffness of smaller arteries may respond differently to vasodilation drugs. The objectives of this study were 1- to assess the feasibility of measuring arterial stiffness of the hand, i.e. radial-finger pulse wave velocity (RF-PWV) using piezoelectric sensors, and 2- to measure RF-PWV and its response to nitroglycerin.

Methods: This exploratory study was conducted in 11 healthy participants (55% were men, mean age was 33.6 ± 10.6 yrs). Piezoelectric sensors (Complior) were placed simultaneously on carotid and radial arteries, and tip of the third finger, to obtain carotid-radial PWV (CR-PWV) and RF-PWV (in triplicates), before and after 4 minutes of 0.4 mg NTG sublingual spray.

Results: Visually, pressure curves at the finger and detection of the foot of the wave were obtained with a similar quality than radial and carotid pressure curves. The RF-PWV intra-session coefficient of variation was 7.3%. At baseline, mean CR-PWV and RF-PWV were respectively of 9.07 ± 1.24 m/s and 4.80 ± 1.42 m/s. After NTG, CR-PWV decreased (7.75 ± 1.32 m/s) and RF-PWV increased (6.75 ± 2.58 m/s), both significantly ($p < 0.01$).

Conclusion: This first attempt to measure small arteries stiffness shows that it is possible to measure hand PWV. Again, we observed opposite changes in regional stiffness of different vascular territories with a vasodilator drug. These results may open up the path to a better understanding of microcirculation consequences of an altered stiffness gradient.