



## 2.5 Differential Association of Central and Peripheral Arterial Compliance with Resting and Recrutable Endothelial Function in Healthy Human Subjects

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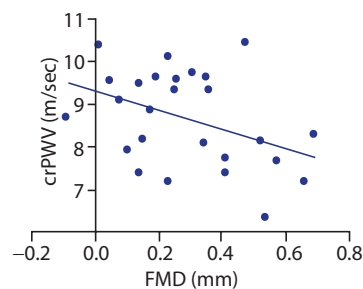
### ABSTRACT

**Background:** Regional arterial compliance in peripheral arteries is known to be associated with ‘recrutable’ endothelial function probably mediated by an increase in smooth muscle tone [1]. However, the association between regional arterial stiffness and ‘resting’ endothelial function has not been evaluated.

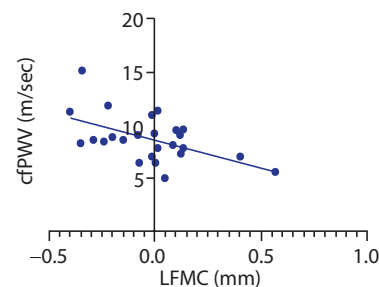
**Methods:** Low Flow Mediated Constriction (LFMC) and Flow Mediated Dilation (FMD) were measured to evaluate ‘resting’ and ‘recrutable’ endothelial function as change in diameter of the brachial artery ( $\Delta D$ ) during and after 5 minutes of suprasystolic occlusion of the forearm in comparison to baseline artery diameter using B-mode ultrasound (M7, MindRay) in 27 healthy subjects (Age  $50.8 \pm 9.6$  years). Central and peripheral regional arterial stiffness was assessed using applanation tonometry (Sphygmocor $\text{\textcircled{O}}$ ) to calculate carotid-femoral (cf) and carotid-radial (cr) Pulse Wave Velocity (PWV) respectively.

**Results:** FMD showed a significant negative correlation with crPWV ( $r = -0.39, p = 0.04$ ) (Figure 1) while LFMC did not correlate with peripheral arterial stiffness. A significant negative correlation was observed between LFMC and cfPWV ( $r = -0.53, p = 0.006$ ) (Figure 2) but not between FMD and cfPWV.

**Conclusion:** Impaired NO bioavailability has been identified as the key mechanism associated with reduced FMD and may result in increased smooth muscle tone thereby contributing to a functional decrease in peripheral arterial compliance. The results of the current study suggest that withdrawal of resting vasodilatory influence of NO may not be a major factor involved in LFMC. The exact mechanisms associating resting endothelial function with structural arterial stiffness in the central vessels needs to be further investigated.



**Figure 1** | Correlation between recruitable endothelial function assessed by flow mediated dilation and peripheral arterial stiffness assessed by carotid-radial Pulse Wave Velocity.



**Figure 2** | Correlation between resting endothelial function assessed by low flow mediated constriction and central arterial stiffness assessed by carotid-femoral Pulse Wave Velocity.

**REFERENCE**

- [1] Badhwar S, Chandran DS, Jaryal AK, Narang R, Deepak KK. Regional arterial stiffness in central and peripheral arteries is differentially related to endothelial dysfunction assessed by brachial flow-mediated dilation in metabolic syndrome. *Diab Vasc Dis Res* 2018;15:106–13.

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