Impact of Blood Pressure Cuff Inflation Rates on Flow-Mediated Dilatation and Contralateral Arm Response

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Abstract

Flow-mediated dilatation (FMD) is widely used as an index of nitric oxide-mediated vasodilator function, yet its methodology has not been well established. Previous research indicates that rapid inflations of a blood pressure cuff evoke systemic vasoconstriction as it was observed on non-occluded contralateral arm. This would potentially contribute to the well-known variability of FMD readings and could complicate the emerging evidence that non-occluded contralateral arm responses during the FMD procedure is associated with the presence of coronary artery disease. **Purpose:** To test the hypotheses that fast inflation of a blood pressure cuff could reduce FMD values and influence contralateral vasodilatory states. **Method:** Thirty-three apparently healthy adults (18 males and 15 females, 29±6 years) were studied in two randomized FMD trials. The blood flow-occluding cuff was inflated fast (<1s with a Hokanson rapid cuff inflation device) in one trial or slow (over a period of 10s) in the other during the FMD procedure. Arterial diameter, fingertip temperature, and infrared thermal images were obtained throughout each session. **Results:** FMD values were not different between the fast and slow cuff inflation trials (5.9±0.6% vs. 5.9±0.4%). There were no differences in fingertip temperature rebound between the trials (1.8±0.3 vs. 1.9±0.3°C). The infrared thermal imaging revealed greater reductions in hand and finger temperature as well as more variable responses in the contralateral arm when the cuff was inflated more rapidly. **Conclusion:** Rates to inflate a blood pressure cuff do not appear to affect FMD readings although a fast cuff occlusion would evoke greater neurovascular changes in the non-occluded contralateral arm.