TACSM Abstract

Assessments of Vascular Function via Flow-Mediated Dilation and Rhythmic Handgrip Exercise in Black and White Men

BRANDI Y. STEPHENS, THALES C. BARBOSA, JASDEEP KAUR, and PAUL J. FADEL

Human Neural Cardiovascular Control Lab; Department of Kinesiology; University of Texas at Arlington; Arlington, TX

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Advisor / Mentor: Fadel, Paul (paul.fadel@uta.edu)

ABSTRACT

Young, otherwise healthy Non-Hispanic Black individuals have been shown to exhibit blunted vascular responsiveness compared to their Non-Hispanic White counterparts, which may be a potential mechanism leading to higher cardiovascular disease risk in this group. Racial differences in vascular function have largely been assessed using flow-mediated dilation (FMD). However, more recent studies have proposed the use of rhythmic handgrip (HG) as an alternative measure of vascular function. **PURPOSE**: To compare whether rhythmic HG exercise could be an alternative technique to FMD in assessing differences in vascular function between black and white individuals. **METHODS**: Brachial artery vasodilation was assessed in young healthy black (N = 7; 21 ± 2 years; BMI: 25.5 ± 1.4 kg/m^2; mean ± SEM) and white (N = 7; 23 ± 2 years; BMI: 24.0 ± 0.5 kg/m^2) men via a standard FMD protocol and rhythmic HG exercise. FMD was assessed by inflating a forearm cuff suprasystolic for 5 min. Rhythmic HG consisted of 3 min HG exercise at 30% of their maximal voluntary contraction (MVC) with a duty cycle of 1-sec contraction/2-sec relaxation. Heart rate (ECG), mean arterial blood pressure (MAP; finger photoplethysmography and automated sphygmomanometer), brachial artery diameter and blood velocity (duplex Doppler ultrasound) were continuously measured during FMD and HG exercise. Brachial artery vasodilation for FMD and rhythmic HG exercise were calculated as a % increase from baseline diameter to peak diameter. **RESULTS:** Both groups had similar MVCs (black men: 53 ± 1 vs. white men: 54 ± 3 kg; P = 0.80) and resting MAP (black men: 83 ± 2 vs. white men: 85 ± 2 mmHg; P = 0.43). Rhythmic HG dilation (P = 0.72) and FMD (P = 0.43) were not different between groups. Interestingly, white men had greater vasodilation with FMD compared to HG (FMD: 5.76 ± 0.58 vs. HG: 4.13 ± 0.52%; P < 0.01). In contrast, black men had similar vasodilation between FMD and HG (FMD: 4.51 ± 1.01 vs. HG: 4.46 ± 0.89%; P = 0.97). **CONCLUSION**: These preliminary data suggest that rhythmic HG exercise and FMD provide similar information in the assessment of vascular function between racial groups.