TACSM Abstract

Influence of Family History of Hypertension on Vascular Function in Young Healthy Black Women

RUBY A. NYARKO, JUSTO PEREZ III, ASHLESHA D. DALVE & JASDEEP KAUR

Neural Cardiovascular Control Lab; Department of Kinesiology and Health Education, University of Texas at Austin, Austin, TX

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Advisor / Mentor: Kaur, Jasdeep (jasdeep.kaur@austin.utexas.edu)

ABSTRACT

Compared to all other racial groups, non-Hispanic Black (NHB) women have the highest prevalence of hypertension (58.4%) in the United States and experience a two-fold higher mortality from hypertension-related causes. Individuals with a positive family history of hypertension (+FHH) have been shown to exhibit blunted vascular function in response to 5-minute ischemia; however, whether the impact of positive family history of hypertension (+FHH) results in a greater attenuation of vascular function in healthy NHB women remains unknown. **PURPOSE**: Herein, we tested the hypothesis that young NHB women with +FHH will elicit attenuated increases in forearm blood flow (FBF) and forearm vascular conductance (FVC) during rhythmic handgrip exercise (RHG) compared to age- and weight-matched NHB women without a family history of hypertension (-FHH). **METHODS**: We studied 14 young normotensive women (+FHH=7) [Age (-FFH: 19 ± 1; and +FHH: 19 ± 1yr; mean ± SD, p = 0.61); BMI (-FFH: 24 ± 2; and +FFH: 24 ± 2 kg/m^2; p = 0.82)]. FBF (duplex Doppler ultrasound) and mean arterial pressure (MAP; finger photoplethysmography) were measured during rhythmic handgrip exercise performed at three workloads (15%, 30%, and 45% of maximal voluntary contraction (MVC)). FVC was calculated as FBF/MAP. **RESULTS**: Baseline FBF (-FHH: 41.9 ± 14.0 and +FHH: 48.0 ± 7.1 ml/min; p = 0.32), FVC (-FHH: 50.0 ± 15.9 and +FHH: 62.9 ± 10.2 ml/min/100 mmHg; p = 0.10), and MVCs (-FHH: 57 ± 12 and +FHH: 54 ± 7 kg; p = 0.53) were similar between the groups. Both groups exhibited intensity-dependent increases in FBF and FVC; however, contrary to our hypothesis, there were no difference between the groups [mixed-model two-way ANOVA; %Δ FBF (group effect p = 0.50, intensity effect p < 0.001, interaction p = 0.89) and %Δ FVC (group effect p = 0.34, intensity effect p < 0.001, interaction p = 0.92). For instance, in response to RHG at 45%, -FHH had 592 ± 190 % increase in FBF from baseline and +FHH had 624 ± 154 % increase. Changes in MAP were not different between the groups at any intensity (e.g., ΔMAP at 45% MVC in -FHH = 11 ± 9 and +FHH = 6 ± 5, p = 0.30). **CONCLUSION**: These preliminary data suggest that the hyperemic responses to rhythmic handgrip exercise in normotensive Black women is not influenced by a positive family history of hypertension.

Keywords: African American; brachial artery blood flow; dynamic handgrip exercise.

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