Exploring the Potential Role of Family History of Hypertension on Racial Differences in Sympathetic Vascular Transduction

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ABSTRACT

The prevalence of hypertension in Non-Hispanic Black (BL) men surpasses all other racial groups. Our laboratory has previously demonstrated exaggerated vasoconstrictor and blood pressure (BP) responses to spontaneous bursts of muscle sympathetic nerve activity (MSNA; sympathetic vascular transduction) in young, healthy BL men compared to their Non-Hispanic White (WH) counterparts. Because a family history of hypertension (FHH) further compounds cardiovascular risk, we wanted to begin to explore the potential impact of a positive (+) FHH on sympathetic vascular transduction. Whether a +FHH influences sympathetic vascular transduction within and between racial groups remains unknown.

PURPOSE: To begin to explore if +FHH influences sympathetic vascular transduction within and between racial groups.

METHODS: 22 men, nine with a +FHH (4 BL men) and 13 without a FHH (-FHH; 6 BL men) were recruited. Beat-to-beat BP (Finometer), femoral artery blood flow (Doppler ultrasound), and MSNA were measured during a 20-minute quiet rest. The mean BP and leg vascular conductance (LVC; blood flow/mean BP) responses to spontaneous bursts of MSNA were quantified via a signal averaging technique.

RESULTS: Resting heart rate, BP, and MSNA were not significantly different between groups (all p>0.05). As previously demonstrated by our laboratory, the BL men exhibited an augmented sympathetic vascular transduction compared to the WH men (e.g., peak BP response, WH men: Δ4.1±0.3, BL men: Δ5.6±0.7 mmHg, p=0.04). When accounting for FHH within the groups, the peak BP (WH +FHH: Δ4.4±0.6 vs. WH -FHH: Δ3.8±0.4 mmHg, p=0.4) and nadir LVC responses (WH +FHH: Δ-0.5±0.07 vs. WH -FHH: Δ-0.5±0.09 ml min⁻¹·mmHg⁻¹, p=0.7) were not significantly different between WH men +FHH and WH men -FHH. Likewise, the BL men +FHH exhibited similar peak BP (BL +FHH: Δ6.2±0.7 vs. BL -FHH: Δ5.3±1.1 mmHg, p=0.5) and nadir LVC (BL +FHH: Δ-1.1±0.44 vs. BL -FHH: Δ-0.6±0.10 ml min⁻¹·mmHg⁻¹, p=0.2) responses to bursts of MSNA compared to the BL men -FHH.

CONCLUSION: These preliminary findings do not support a role for +FHH in augmented sympathetic vascular transduction, therefore suggesting that racial differences in sympathetic vascular transduction are independent of FHH.