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Effects of Capsaicin on the Hemodynamic Responses to Handgrip Exercise: Potential Influence of Race

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Previous work in vitro suggests that capsaicin, the spicy ingredient in peppers, attenuates the vascular response to sympathetic activity (“sympatholysis”), likely mediated through vascular transient receptor potential vanilloid type 1 (TRPV1), improving vascular function, though translational studies are needed. Further, given racial disparities in cardiovascular health, exploring the potential physiological mechanisms underpinning these differences is warranted. **Purpose:** To determine the impact of acute capsaicin ingestion on the central hemodynamic responses to sympathetic stimuli, such as lower body negative pressure (LBNP) at rest. **Methods:** In a single-blind crossover design, 23 young healthy black (n=13) and white males (n=10) were given placebo (fiber) or capsaicin (Chile pepper) capsules. Stroke volume (SV), cardiac output (CO), mean arterial pressure (MAP), and heart rate (HR), were measured continuously using a Finometer, at rest and during LBNP (-20 mmHg). **Results:** Baseline SV was significantly different between black and white males (black male capsaicin: 81±15 vs white male capsaicin: 98±17, p=0.032). Baseline CO in the capsaicin trial was trending towards a significant difference (black male capsaicin: 4.6±0.8 vs white male capsaicin: 5.4±0.9, p=0.076). The LBNP-induced changes at rest appeared larger for black males (SV -18±4ml vs. -8±11ml and MAP 4.6±6 vs. 1.3± 5mmHg, black vs. white), which were reversed with acute capsaicin (SV -10.7±13 vs. -9±16ml and MAP -2±9 vs. 1.2± 8mmHg, black vs. white). **Conclusion:** Capsaicin, and assumed activation of TRPV1 receptors in afferent neurons, seems to affect the hemodynamic response to LBNP, in a race-specific manner. However, further work is needed to determine the mechanisms for the differences in hemodynamics at rest and in response to LBNP and acute capsaicin between races.