Does sex influence near-infrared spectroscopy-derived indicators of vascular reactivity and the response of acute dietary capsaicin

Kendall S. Zaleski

Advisor: Dr. Stephen J. Ives

Abstract

Introduction: Endothelial dysfunction precedes cardiovascular disease development, is associated with deficiencies in nitric oxide (NO), and may be sex-specific. Although, it is unknown if Capsaicin, an agonist for transient receptor potential vanilloid channel 1 (TRPV$_1$), alters endothelial function in a sex-dependent manner, as assessed via near-infrared spectroscopy (NIRS)-derived measures of tissue oxygen saturation (StO_2) rate of reperfusion. Purpose: Therefore, this study sought to determine if there was sex-specificity in the effect of capsaicin on NIRS-derived vascular responsiveness, as estimated via reperfusion rates, in the forearm and thigh. Methods: In a blinded crossover design, the reperfusion rates of 45 young males (M: n=25) and females (F: n=20) were assessed after acute ingestion of placebo or capsaicin. Urine samples were assayed for nitrate/nitrite (NOx) concentrations and antioxidant capacity. Results: In the placebo condition, females had greater reperfusion rates in both the forearm (M: 0.44±0.24 vs. F: 0.98±0.46 %/sec; p=0.002, d=1.50) and quadricep (M: 0.86±0.31 vs. F: 1.17±0.43 %/sec; p=0.010, d=0.85). There was a significant interaction of sex*treatment for NOx concentrations, where males increased (M: placebo 21.13±2.83µM, capsaicin 23.82±13.34µM), while females decreased (F: placebo 22.78±14.40 µM, capsaicin 14.43±0.01 µM; p=0.037, ^{2}