TACSM Abstract

Effect of Prior Aerobic Exercise on High-Sugar Meal Induced Endothelial Dysfunction in Postmenopausal Women

SARAH BAILEY[1], ADAM GLOCKENER[1], ANDREAS KREUTZER[1], EMILY GARRITY[1], LACHRISTINA ADAMS[1], CARMEN COOK[1], JOEL MITCHELL[1], BEVERLEY ADAMS-HUET[2], DENNIS CHEEK[1], JONATHAN OLIVER[1], MELODY PHILLIPS[1], and MEENA SHAH[1]

[1]Metabolic Lab, Department of Kinesiology, Texas Christian University, Fort Worth, TX
[2]Department of Internal Medicine, UT Southwestern Medical Center, Dallas, TX

Category: Masters

Advisor / Mentor: Shah, Meena (m.shah@tcu.edu)

ABSTRACT

High-sugar meals may cause endothelial dysfunction. It is unclear if aerobic exercise performed 13-16 h prior to consumption of a high-sugar meal (HSM) attenuates endothelial dysfunction in postmenopausal women (PMW). **PURPOSE**: To examine if prior aerobic exercise attenuates endothelial dysfunction induced by a HSM in PMW. **METHODS**: Twenty-two PMW were recruited for the study. All subjects completed 2 trials, one with exercise (EX) and the other without exercise (NE), in a randomized cross-over design, with a washout period of ≥ 7 days. During the EX trial, the subjects completed a 60 min bout of supervised aerobic exercise, at 75% of their age predicted max heart rate, 13-16 h prior to the HSM consumption. The subjects in the NE did not perform any exercise prior to the HSM consumption. In both trials, the HSM was consumed in the morning after a 12-h overnight fast. The meal contained 33% of the subjects' daily energy needs, and comprised 73.1% energy from CHO, 23.4% energy from fats, and 3.5% energy from protein. Flow mediated dilation (FMD) was assessed at baseline, and at 60, 120, and 180 minutes after the meal began. Blood samples, collected at the same time, were analyzed for glucose, insulin, endothlin-1 (ET-1), and nitric oxide (NO) concentrations. **RESULTS**: Repeated measures analysis test showed a significant exercise condition by time interaction effect for ET-1(p=0.03) but not FMD (p=0.93), glucose (p=0.79), insulin (p=0.36), or NO (p=0.46). Post-hoc analysis revealed no difference by condition during any of the time points for ET-1, however. Area under the curve responses in the EX compared to the NE condition were also not different (median (25-75th percentiles)) for FMD (26.6 (21.1-29.4) vs. 25.5 (22.5-31.1) %*h ; p=0.11), glucose (286.8 (260.6-336.6) vs. 277.5 (246.1-342.6) mg/dL*h; p=0.93), insulin (97.2 (62.6-127.5) vs. 102.0 (75.3-138.5) µIU/mL*h; p=0.44), ET-1 (4.58 (3.88-4.98) vs. 4.73 (3.91-5.47) pg/mL*h; p=0.30), or NO (70.4 (57.2-103.3) vs. 71.5 (56.7-112.3) µmol/L*h; p=0.67). Further analysis with the magnitude based inference (MBI) method, showed a possible clinical benefit of the EX compared to NE condition at 180 min for FMD (mean (95% confidence intervals)) (EX: 9.2% (7.5- 10.9%) vs. NE: 7.9% (6.3-9.6%)). **CONCLUSION**: Prior exercise compared to no exercise did not affect endothelial function, or blood glucose, insulin, ET-1, or NO after a HSM in PMW. There was a possible clinical benefit of the EX compared to NE condition at 180 min for FMD.