TACSM Abstract

Impact of Menstrual Cycle on Submaximal Exercise VO_2 and Critical Power in Active Eumenorrheic Females

EMMA W. WARE[1], ADELLE KANAAN[1], ERIKA R. ZOELLNER[1], CATHERINE MBANGO[1], DELTRA MUOKI[1], WAYNE BREWER[1], MINDY A. PATTERSON[1], DEREK C. MIKETINAS[1], SIDDHARTHA S. ANGADI FACSM[2], BRANDON J. SAWYER[3], GLENN A. GAESSER FACSM[4], & WESLEY J. TUCKER[1]

[1]Texas Woman's University; Department of Nutrition and Food Sciences; Houston, TX
[2]University of Virginia; Department of Kinesiology; Charlottesville, VA
[3]Point Loma Nazarene University; Department of Kinesiology; San Diego, CA
[4]Arizona State University; College of Health Solutions; Phoenix, AZ

Category: Doctoral

Advisor / Mentor: Tucker, Wesley (wtucker1@twu.edu)

ABSTRACT

The effects of the menstrual cycle (MC) on exercise metabolism and performance are equivocal. **PURPOSE:** To investigate whether the MC impacted submaximal exercise oxygen consumption (VO_2) and Critical Power (CP) in recreationally active, eumenorrheic females. **METHODS:** Eight eumenorrheic females (Age: 33±8 y, VO_{2max}: 36.9±3.8 ml/kg/min) completed fasted exercise testing in 3 distinct phases of the MC (early follicular, late follicular, and mid luteal). MC phase was determined using calendar-based counting, ovulation test strips, and confirmed via serum hormones (estrogen and progesterone). For submaximal exercise, participants cycled for 20 min at 50% VO_{2max} while VO_2 and respiratory exchange ratio (RER) were measured with indirect calorimetry. Rating of perceived exertion (RPE) was measured with Borg 6-20 Scale. After submaximal exercise, participants rested for 10 min and performed a 3-min all-out test to assess CP. Power output (W) was continuously measured to determine CP, which was defined as mean W in final 30 sec of 3-min all-out test. Repeated measures ANOVA was used to assess differences in submaximal responses for VO_2 and RER, and 3-min all-out CP. Friedman tests were used to assess differences in RPE. **RESULTS:** For submaximal cycling, VO_2 did not differ across MC (early follicular: 1.27±0.22 L/min, late follicular: 1.27±0.20 L/min, mid-luteal: 1.27±0.22 L/min; p-value=0.98; effect size=0.01). However, RER was higher during late follicular (0.91±0.03) than early follicular (0.89±0.05) and mid-luteal (0.89±0.03) phases (p=0.12; effect size=0.30). RPE was lower during late follicular (11±2) compared to early follicular (13±2) and mid luteal (13±2)(p=0.04). For the 3-min all-out test, CP did not differ by MC phase (early follicular: 138±31 W, late follicular: 136±33 W, mid luteal: 136±31 W; p=0.52; effect size=0.07). **CONCLUSIONS:** These preliminary results in 8 recreationally active, eumenorrheic females suggest that submaximal exercise VO_2 and CP do not differ across the MC, despite minor differences in submaximal substrate utilization and perceived exertion.