

Comparing Physiological Responses During HIIT versus HIFT

MADISON MOWER, KIONTE STOREY, MARISSA FLANNERY, ADAM GESCHWINDT,
& TODD A. ASTORINO, FACSM

Department of Kinesiology; California State University San Marcos; San Marcos, CA

Category: Undergraduate

Advisor / Mentor: Astorino, Todd A. (astorino@csusm.edu)

ABSTRACT

High intensity interval training (HIIT) improves cardiorespiratory fitness, glycemic control, and body composition, yet the majority of studies used cycling which employs a smaller muscle mass. Less data have examined the acute response to whole-body HIIT. **PURPOSE:** To compare physiological responses between HIIT rowing and high intensity functional training (HIFT). **METHODS:** Healthy, non-obese men and women (N=18, age=25±8 yr) who are physically active (PA=7±2hr, VO₂max=39±8mL/kg/min) underwent graded exercise testing to determine VO₂max and peak power output (PPO) on the rowing ergometer. On two separate days, subjects performed a time-matched bout of HIFT or HIIT rowing. HIFT required 6 'all-out' sets of 10 push-ups, 10 jump squats, 20 mountain climbers, and 20 body-weight squats separated by 75 s recovery. HIIT rowing consisted of six 1min bouts at 85% PPO with 75 s of recovery. Gas exchange data, heart rate (HR), affective valence, and RPE were obtained during exercise. Blood lactate concentration (BLa) was measured at rest, bout 3, and 5, 10, and 15 min post-exercise. **RESULTS:** There were significant differences (p<0.05) in HR_{peak} between HIFT and HIIT rowing (173±4 vs. 168±4 b/min), peak BLa (9±3 vs. 6±2 mM), energy expenditure (102±6 vs. 118±9 kcal), and RER (1.20±0.02 vs. 1.10±0.02). Mean VO₂ was higher (p=0.03) with HIIT rowing versus HIFT (1.88 ± 0.51 vs. 1.67 ± 0.35 L/min) as was total O₂ (31±8 vs. 28±6L). GroupXtime interactions (p<0.01) for HR, RER, V_E, and RPE occurred, with higher values demonstrated to HIFT. **CONCLUSION:** HIFT elicited a higher peak HR, BLa, and RER, suggesting a higher peak cardiovascular stimulus and greater activation of glycolysis, likely due to greater recruitment of fast twitch fibers. Yet, HIIT rowing elicited higher energy expenditure and mean VO₂ versus HIFT. The eccentric nature of HIFT may explain the blunted VO₂ response, although more studies are needed to verify this result.