TACSM Abstract

The Effect of Cardiovascular Drift on the Efficacy of Exercise Prescription

KATHERINE FORESTER, JIMMY SMITH, and SCOTT McLEAN

Department of Kinesiology; Southwestern University; Georgetown, TX

Category: Undergraduate

ABSTRACT

Due to the difficulty in measuring metabolic cost in the field, heart rate (HR) is often used to prescribe exercise intensity. **Purpose:** To examine the effect of cardiovascular drift (CV_drift) on the efficacy of exercise prescription (ExRx). **Methods:** Eight women with a mean (sd) age 21.6(2.0) years, body mass 70.9(11.0) kg, height 163.7(6.0) cm, and VO_{2\text{max}} of 33.7(4.2) mL/kg/min, each performed two cycling trials for 30 to 45 min at work rates that elicited 50% and 70% of VO_{2\text{max}}. HR (bpm) and VO_{2} (mL/kg/min) were recorded throughout each trial and values at the beginning, middle, and end of exercise across both intensities were compared using 3 x 2 two-way repeated measures ANOVAs. Repeated measures ANOVAs were used to compare responses across time within each exercise intensity. **Results:** Estimated work rates accurately elicited 50% and 70% of HR_{max} and VO_{2\text{max}} at 5 min of exercise. For HR, there was a significant effect of both time (F(1,2) = 124.8, p < .001) and intensity (F(1,1) = 312.0, p < .001), and a significant interaction between time and intensity (F(1,2) = 6.14, p = 0.012). There was a significant effect of time on HR at both the 50% intensity (F(1,2) = 40.74, p < .001) and 70% intensity (F(1,2) = 101.9, p < .001). VO_{2} increased significantly due to both time (F(1,2) = 6.63, p = .009) and intensity (F(1,1) = 312.0, p < .001) but there was no interaction, and the significant effect of time was only at the 70% intensity (F(1,2) = 3.90, p = .05). **Discussion:** The main finding of this study was that HR and metabolic demand became increasingly dissociated across time at both intensities. This dissociation was more pronounced at an intensity of 70% of VO_{2\text{max}} than 50% of VO_{2\text{max}}. This finding implies that during prolonged exercise at a steady work rate, HR becomes increasingly less valid as a surrogate for metabolic demand of exercise.