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Comparison of the Effects of Sprint Interval Exercise, Steady State Exercise and Control on RMR

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Exercise is a modality that may result in an elevation of resting metabolic rate (RMR) due to homeostatic disruption. Sprint Interval Training (SIT) exercise is widely recognized as a time efficient, low-volume, high-intensity alternative to endurance training and, in acute phases, may elevate RMR for longer durations. **PURPOSE:** To compare the effects of an acute bout of SIT vs. steady state (SS) vs. control (CON) on 24-h RMR in recreational active college-aged males. **METHODS:** In this randomized crossover design, 13 recreationally active males ages 18-30 yrs. (24.1 ± 2.3) participated in three exercise sessions using an electronically braked cycle ergometer: SIT (5, 30-sec. sprints, interspersed with 4-min. active recovery), SS (70% $VO_{2\ peak}$ for 30 min.) and CON. Exercise sessions were separated by one week. All sessions included 7 RMR measurements taken at the same times over a 24-h period (8am resting, 8:50am pre-ex, 10:10am post-ex, 12:10pm 2-h post-ex, 1:00pm 3-h post-ex, 4:00pm 6-h post-ex and 10:10am the following morning 24-h post-ex). RMR comparisons were made using two-way ANOVA with repeated measures. **RESULTS:** There was a significant main effect for group with regard to RMR (F=5.706; p=.043) with no effect of time (F= 5.351; p=.113) or group x time interaction (F=1.486; p=.066). There was a significant difference between SS (2116 kcal) and CON (1891 kcal) (p=.009) and SIT (2105 kcal) and CON (1891 kcal) (p=.012). SS (2116 kcal) and SIT (2105 kcal) were not different (p=.994). There was a significant effect for time between combined exercise (CE) condition vs. CON when comparing rest to pre (ΔCE = 582 kcal vs. Δ CON = 498 kcal) (p=.002), rest to post-ex (ΔCE = 628 kcal vs. ΔCON = 211 kcal) (p=.034), and rest to 6-h post (ΔCE = 716 kcal vs. ΔCON = 193) (p=.016). There was a significant group x time interaction for CE vs. CON (p = .043). Post-hoc analysis revealed statistical differences in measurements 2-h post (p= 0.018; 455 kcal), 3-h post (p= 0.002; 599 kcal) and a trend towards statistical significance at 6-h post (p= .076; 340 kcal) and 24-h post (p=0.103; 313 kcal). **CONCLUSION:** A single bout of SIT may significantly elevate post-exercise RMR, and if repeated regularly, may confer longer-term benefits similar to that produced by 30 minutes of SS exercise.