

TACSM Abstract

The Effects of Two Different Sprint Training Modalities on Sprint Speed, Aerobic Fitness and Body Composition

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ABSTRACT

Previous studies on sprint training have shown subjects to improve not only sprint speed, but also aerobic fitness and body composition. However, it is unclear whether sprint training on the track is more effective in improving these variables compared to training on a high-speed treadmill. The purpose of this study was to examine the effects of a 6-week track (TR) vs. high-speed treadmill (TM) sprint training on maximal aerobic capacity (VO_2max), sprint speed and body composition. Twelve subjects were randomly assigned to the TR ($n=6$; 3 males, 3 females) or TM training group ($n=6$; 3 males, 3 females). All subjects performed 2 training sessions weekly, performing 4 maximal sprints with 3-4 minutes rest in between attempts. Four cones were placed along the track to simulate progression of speed to replicate treadmill conditions. TR started from an upright jog position and progressively increased speed at each cone (60%, 70%, 80%, and 90%) of maximal speed and 100% maximal speed through the recording zone (5-6 seconds). A treadmill speed test was applied increasing treadmill speed to the subjects' loss of control, while suspended in a safety harness. VO_2max was measured by Parvomedics True Max 2400 metabolic cart and body composition was measured by Dual Energy X-ray absorptiometry (DXA) at baseline and after the 6 weeks of training. Treadmill sprint speed improved significantly in both groups (TR 16.36 ± 0.54 to 17.79 ± 0.52 miles/hr, $p=0.0003$; TM 17.13 ± 0.84 to 18.63 ± 0.93 miles/hr, $p=0.0018$). VO_2max was improved in both groups (TR 46.60 ± 2.03 to 49.54 ± 1.71 ml/kg/min, $p=0.03$; TM 47.59 ± 4.152 to 51.05 ± 4.445 ml/kg/min, $p=0.04$). There was no significant change in body mass index (TR 24.1 ± 1.0 to 24.0 ± 1.0 kg/m²; $p=0.51$; TM 24.5 ± 0.7 to 24.1 ± 0.8 ; $p=0.30$) or in lean mass (TR 44.08 ± 3.12 to 43.80 ± 2.62 kg; $p=0.73$; TM 48.41 ± 5.29 to 44.55 ± 7.49 kg; $p=0.36$) in either group. There was a significant decrease in percent body fat in the TR group (30.36 ± 3.75 to $29.20 \pm 3.75\%$; $p=0.01$) but not in the TM group (27.83 ± 5.50 to $27.20 \pm 5.95\%$; $p=0.38$). In summary, both the track and treadmill sprint training modalities appear to be effective to improve sprint speed and aerobic power after only 6 weeks of training. However, only track sprint training appears to be beneficial towards decreasing body fat.