

Effect of compression tights on thermoregulation and performance during high intensity intermittent running.

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The use of compression garments has become common place in many team sports, irrespective of environmental conditions, both in training and matches. Many competitions take place in hot environmental conditions which can impair both intermittent running (Morris et al., 2005, *International Journal of Sports Medicine*, 26, 805-814) and skill performance (Sunderland & Nevill, 2005, *Journal of Sports Sciences*, 23, 531-540). Therefore the aim of the research was to ascertain whether wearing compression leggings influenced thermoregulation and performance during simulated team games activity.

Following institutional ethical approval 7 physically active, non-acclimated, healthy males (mean±SD age 23±4 years, height 1.83±0.11 m and body mass 83.9±10.9 kg) volunteered to participate. In a randomised order, four main trials involving repeated sprint exercise (5 x 6 s maximal sprints, 24 s recovery) before and after two 45 min bouts of a football specific intermittent treadmill protocol were completed. Three trials were completed in hot conditions (32 °C, 50% RH): 1) wearing graduated compression tights; 2) sham tights and 3) control (normal sports clothing). The fourth trial was completed in moderate conditions (15 °C, 50 % RH) in normal sports clothing. Sprint performance (mean and peak power output), rectal temperature, heart rate, blood lactate, rating of perceived exertion (RPE) and thermal sensation were all recorded. The effect size (Cohen's *d*) was calculated using paired comparisons and interpreted using the following thresholds: 0.2 – 0.5 = small effect; 0.5 – 0.8 = moderate effect and > 0.8 = large effect. 95% of the confidence intervals of the difference were also calculated. Data are presented as mean±SD.

While there were performance, physiological and perception differences between the hot and moderate trials (all medium to large effect sizes), there were no differences between hot trials with and without compression garments. Mean power output was greater in the moderate trial than the hot trials (moderate vs hot compression -81 W (-123 to -40) $d=0.69$; moderate vs hot sham -94 W (-126 to -62) $d=0.60$ and moderate vs hot control -64 W (-115 to -130) $d=0.52$). Rectal temperature was lower in the moderate trial than the hot trials from 30 min onwards (moderate vs hot compression -0.5 °C (-0.9 to -0.1) $d=1.21$; moderate vs hot sham -0.4 °C (-0.7 to -0.1) $d=1.01$ and moderate vs hot control -0.4 °C (-0.8 to 0.0) $d=0.93$). RPE, thermal sensation and heart rate were lower during the moderate trial, but were not different in the 3 heat trials.

When exercising in the heat, compression tights do not alter repeated sprint performance, thermoregulation, heart rate or perceptual responses compared with a sham garment or normal sports clothing.