PERFORMANCE, PHYSIOLOGICAL, AND PERCEPTUAL EFFECTS OF WEARING GRADUATED COMPRESSION STOCKINGS DURING RUNNING

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Purpose: The aims of these studies were to examine the effects of wearing different grades of graduated compression stockings (GCS) on performance, physiological, and perceptual measures before, during, and after exercise in well-trained runners. **Method:** Two separate running studies were conducted where participants wore different grades of GCS compared with a placebo control stocking in random, counter-balanced order: (1) a field study focussed on a series of 10-km running performances on a 400m track; (2) a laboratory study that examined the effects of 40-min treadmill running on physiological, perceptual, and muscle function responses. Changes in muscle function and damage were determined pre- and post-run by measuring creatine kinase (CK) and myoglobin (Mb) concentrations, counter-movement jump (CMJ) height, muscle soreness, and pressure sensitivity. Physiological measurements of heart rate (HR), oxygen uptake ($\dot{V}O_2$), blood lactate concentration [La], and ratings of perceived exertion (RPE) were measured during running. Pre- and post-run perceptual scales assessed comfort, tightness and pain associated with wearing GCS. **Results:** There were no significant differences in 10-km run time, mean HR, $\dot{V}O_2$, [La], and RPE for participants wearing different GCS in (1) and (2) ($P<0.05$). Con and Low were rated most comfortable ($P<0.05$) and Hi were tightest ($P<0.05$) and induced more pain ($P<0.05$) when GCS were compared in both studies. CMJ was better in participants wearing Low and Med GCS post-run compared with Con in (1) and for Con and all GCS at 0 h post-exercise in (2). CK and Mb levels were higher ($P<0.05$) and pressure sensitivity was more pronounced ($P<0.05$) at 0 h post-run for Con and all GCS (2). Few participants (4/10) reported muscle soreness at any one location in (2). **Conclusions:** Well-trained runners did not experience improved performance, physiological, or perceptual responses when wearing different grades of GCS during 10-km track or 40 min treadmill running compared with a control garment. 40 min treadmill running at 80% $\dot{V}O_2$ max may not be strenuous enough to elicit a loss of muscle function in well-trained runners. Runners felt more comfortable wearing GCS that had less compression.

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