

## **The effects of custom-made compression garments on recovery and performance parameters after high intensity running**

**Bolessa, J.<sup>1</sup> & Galbraith, A.<sup>1</sup>**

<sup>1</sup>Applied Sport and Exercise Sciences, School of Health Sport and Bioscience, University of East London, London, UK.

✉ [u1405642@uel.ac.uk](mailto:u1405642@uel.ac.uk) [A.J.Galbraith@uel.ac.uk](mailto:A.J.Galbraith@uel.ac.uk)  @jordonbolessa @running\_science

Returning to optimal performance can be achieved through balancing training stress and recovery (Kellmann [2010] *Scandinavian Journal of Medicine and Science in Sports*, 20, 95-102). Insufficient recovery can leave individuals feeling muscle pain and discomfort (DOMS), lasting for up to 5-7 days after exercise (Valle et al [2013] *Muscles Ligaments Tendons Journal*, 3, 295–302). In recent years, interest in compression garments (CG) has grown as a non-invasive recovery modality. CG create an external pressure gradient, reducing space for swelling thus reducing muscle damage (Jimenez et al [2016] *Physiology and Behaviour*, 153, 133-148). CG have also been found to improve performance through improved blood flow to the muscles (Hill et al [2013] *British Journal of Sports Medicine*, 48, 1340-6). Previous research has focused on 'off-the-shelf' CG, with limited research of made-to-measure CG, tailored to fit the individual athlete. Accordingly, the present study aimed to investigate the effects of made-to-measure CG on performance and recovery indicators, during and after high intensity running. Eleven recreationally trained runners performed two time to exhaustion treadmill trials (TTE) at 110% of their identified critical speed. One trial was performed in running shorts and the other in compression garments. Trials were presented in a counter-balanced order. CG were a full-length lower limb design, custom made to each participant (Kurio Compression, Nottinghamshire, UK). Performance CG were worn during the trial and recovery CG were worn for 12 hours, immediately after the completion of the CG trial. A variation in applied pressure distinguished between the garments. TTE, pre and post blood [lactate] and running economy were recorded. Participants recorded their perceived level of DOMS through a visual analogue scale (VAS), pre, post, 12 hr and 24 hr after running trials, thus assessing recovery. TTE was significantly Improved ( $P = 0.01$ ;  $d = 0.39$ ) when wearing CG ( $687 \pm 254$  vs.  $599 \pm 189$  s), along with a reduced perception of DOMS after 12 hr ( $14.4 \pm 12.9$  vs.  $22.7 \pm 15.2$  mm;  $P = 0.01$ ;  $d = 0.59$ ) and 24 hr ( $5.8 \pm 6.0$  vs.  $13.27 \pm 11.9$  mm;  $P = 0.01$ ;  $d = 0.79$ ). No significant differences between conditions, in response to the running trial, were found in blood [lactate] or heart rate, however, a small effect ( $38.89 \pm 11.6$  vs.  $42.6 \pm 10.2$  ml·kg·min<sup>-1</sup>;  $d = 0.34$ ) for improved running economy was reported during the CG trial. This data confirms CG improved high intensity running performance and recovery, however, mechanisms remain somewhat unclear. It should be noted that improvements might be a result of individual's self-belief or a potential placebo effect.