THE EFFECT OF LOWER BODY COMPRESSION GARMENTS ON PHYSIOLOGICAL AND PERFORMANCE RESPONSES ACROSS A ONE HOUR CYCLING TIME TRIAL

Dascombe Ben¹, Scanlan Aaron¹, Osborne Mark², Reaburn Peter¹
(Central Queensland University¹, Queensland Academy of Sport², Australia)

Introduction
Few studies have examined the effects of lower body compression garments (LBCG) on the physiological and performance responses during high-intensity exercise (1, 2). No previous research has examined their use during cycling. The present study investigated the effect of LBCG on physiological and performance responses in young well-trained cyclists during a one hour time trial.

Methods
Ten competitive male cyclists ((mean ± SD) 20.5 ± 3.6 yr; 177.5 ± 4.9 cm; 70.5 ± 7.5 kg; 55.2 ± 6.8 mL/kg/min) volunteered for the study. All cyclists completed two randomised incremental tests to determine anaerobic threshold and VO₂max in the LBCG (full-length SportSkin™ Classic, Skins) and control (briefs) conditions. Each subject then completed two self-selected one hour time trials in the two conditions on a Lode Exacalibur. Average power output and total work were taken as measures of cycling performance. During the time trials, heart rate was monitored using Polar s610i monitor (Polar Electro, Oy, Kempele, Finland) and blood lactate was analysed every 15 min using an Accusport lactate analyser (Boehringer Mannheim, Germany). Expired gas measures were analysed from the last five min of each 15 min period using a Medgraphics CPX/D system (Medgraphics®, Parkway, USA). Oxygenation of the v. lateralis was monitored using a custom-built near infra-red spectroscopy system. Parametric statistics and effect size comparisons were used to identify any significant or likely benefits of LBCG.

Results
No statistical or practically likely differences were observed between the LBCG and control conditions in heart rate (166.6 ± 7.2 bpm; 166.6 ± 7.2 bpm), blood lactate (5.0 ± 1.9 mmol/L; 5.0 ± 2.6 mmol/L), or oxygen consumption (39.3 ± 3.7 mL/kg/min; 38.0 ± 3.9 mL/kg/min), respectively. Similarly, no differences were observed between the mean (226.2 ± 50.0 W; 225.8 ± 46.2 W) or peak (298.8 ± 51.4 W; 301.8 ± 56.2 W) power output across between the two conditions. The total accumulative work was also similar between the LBCG and control conditions (8264.2 ± 1829.6 kJ; 8252.7 ± 1690.0 kJ). No significant difference was observed in oxygenation of the v. lateralis across the time trial, a practically likely difference (62.28:10%; µ2 = 0.6) was observed between the LBCG (57.3 ± 8.2%) and control (52.2 ± 12.2%) conditions.

Discussion/Conclusion
The likely difference in the oxygenation of the v. lateralis is suggestive of changes in muscle efficiency during prolonged steady state exercise, however this was not supported by other physiological measures. Although this may be a physiological important finding, no improvements in cycling performance were observed. Further research should investigate methods to translate the proposed physiological effects of LBCG into improvements in performance.

References
Keywords: Cycling, Sport Garments, Infrared Spectroscopy

12th Annual Congress of the ECSS, 11–14 July 2007, Jyväskylä, Finland