which increased from 59.7 ± 7.8 to 66.5 ± 10.9 ml · kg^{-1} · min^{-1} (P = 0.008) and RER_{max} which showed an increase of 0.077 ± 0.032 (P = 0.0137). Additionally there was a significant increase (P = 0.0038) for end power output (W_{max}) increasing from 341.8 ± 56.4 to 355.8 ± 58.3, coupled with a significant increase for time of arrival at $\dot{V}O_{2max}$ from 329.8 ± 8 W to 346.0 ± 50.2 W (P = 0.025). Haematological responses were observed for HcT, increasing from a pre-intervention score of 47.5 ± 3.6% to 51.1 ± 2.7% (P = 0.0038) and Ery (P = 0.0022) rose from 5.18 ± 0.38 µl to 5.58 ± 0.26 µl. The CON group showed no change across any variable following the 4-week intervention period (P < 0.05).

These data suggest that in a group of physically active males, four weeks of HIT elicits adaptations in the O_2-carrying capacity of the blood but would appear to have little effect on the maximal oxygen uptake. However the fact that GET occurrence as a $\%W_{max}$ did not change but that there were significant increases for W_{max} and time of arrival at $\dot{V}O_{2max}$ coupled with a trend for an increase in plateau incidence does suggest that HIT-based exercise results in adaptations to the finite anaerobic capacity. These data suggest that HIT rather than being a suitable exercise modality for increasing cardiorespiratory fitness is more suitable as a means of enhancing the efficiency of the pathways for anaerobic substrate metabolism.

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Poster – The trajectory of the centre of pressure during walking in barefoot, minimalist footwear and traditional running shoe conditions in females

A. GREENHALGH[1]*, J. HAMPSON[2], P. THAIN[2] & J. SINCLAIR[3]

[1]*London Sports Institute, Middlesex University, London, UK,* [2]*Life Sciences, University of Hertfordshire, Hatfield, UK and* [3]*Centre for Applied Sport and Exercise Sciences, UCLan, Preston, UK*
*a.greenhalgh@mdx.ac.uk

Introduction: Walking barefoot has been identified as having benefits to bone health (Shakoor & Block, 2006). However, walking barefoot without any protection for the feet can expose feet to injuries due to contact with sharp objects (Vidyadhara & Rao, 2006). Minimalist footwear designs have been developed in an attempt to encourage human movement in shod similar to that of barefoot conditions. Centre of pressure (COP) variables recorded during walking have been identified as risk factor for the aetiology of lower leg injuries (Willems et al., 2005). The purpose of this study was to investigate the differences between COP variables measured in barefoot, Huaraches and typical running shoes (TRS) during running.

Methods: Seventeen healthy female participants were examined (aged 21.2 ± 2.3 years, height 165.4 ± 5.6 m, mass 66.9 ± 9.5 kg, foot size 6.8 ± 1.0 UK). Participants performed five footfalls in each footwear condition (barefoot, minimalist and TRS) at a controlled speed of 1.25 m · s^{-1} ± 10% over an RS foot scan mat. COP data was collected at 500 Hz and various timing (initial metatarsal contact (IMC), initial forefoot contact (IFFC) and heel off (HO) times after initial foot contact), medial-lateral displacement (X-comp) and velocity data (VEL X) were calculated. Repeated measures ANOVA were used to determine the differences between footwear conditions.

Results: Significant differences (P < 0.05) between minimalist shoes and the barefoot conditions were identified during the timing of events (IMC, IFFC and HO times). No significant differences were found between the two conditions when considering the mediolateral (ML) movement of the COP. The TRS condition reported significant (P < 0.05) differences between the minimalist and barefoot conditions in the variables IMC, IFFC times, IFC, IMC and HO X-comps and IMC Vel-X and between the barefoot conditions for the variable HO time.

Discussion and conclusions: Differences in timing events between the barefoot and minimalist conditions may be due to the minor increase in cushioning in the footwear. Increased ML movement of the COP trajectory suggests a possible increase in movement about the ankle joint linked to injury (Willems et al., 2005). The minimalist footwear appears to allow for a movement strategy that replicates that of barefoot walking.

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