Whole-body cryotherapy's enhancement of acute recovery of running performance in well-trained athletes.

Randomized controlled trial


Abstract

PURPOSE: To examine the effects of a whole-body cryotherapy (WBC) protocol (3 min at -110°C) on acute recovery and key variables of endurance performance during high-intensity intermittent exercise in a thermoneutral environment.

METHODS: Eleven endurance athletes were tested twice in a randomized crossover design in which 5×5 min of high-intensity running (HIR) were followed by 1 h of passive rest at ~22°C, including either 3 min of whole-body exposure to -110°C (WBC) or a placebo intervention of 3 min walking (PBO). A ramp-test protocol was performed before HIR (R1) and after the 1-h recovery period (R2). Time to exhaustion (tlim) was measured along with alterations in oxygen content of the vastus lateralis (TSI), oxygen consumption (VO2), capillary blood lactate, heart rate (HR), and rating of perceived exertion (RPE) during submaximal and maximal running.

RESULTS: The difference in tlim between R1 and R2 was lower in WBC than in PBO (P<.05, effect size d=1.13). During R2, TSI was higher in WBC during submaximal and maximal running (P<.01, d=0.68-1.01). In addition, VO2, HR, and RPE were lower at submaximal level of R2 after WBC than in PBO (P=.04 to <.01, d=0.23-0.83).

CONCLUSION: WBC improves acute recovery during high-intensity intermittent exercise in thermoneutral conditions. The improvements might be induced by enhanced oxygenation of
the working muscles, as well as a reduction in cardiovascular strain and increased work economy at submaximal intensities.

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