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

Randomized controlled trial

Krüger M, et al. *Int J Sports Physiol Perform.* 2015.

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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 $\sim 22^{\circ}\text{C}$, 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 (t_{lim}) was measured along with alterations in oxygen content of the vastus lateralis (TSI), oxygen consumption (VO_2), capillary blood lactate, heart rate (HR), and rating of perceived exertion (RPE) during submaximal and maximal running.

RESULTS: The difference in t_{lim} 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, VO_2 , 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

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the working muscles, as well as a reduction in cardiovascular strain and increased work economy at submaximal intensities.

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