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Whole-body Cryotherapy on Proprioception and Muscle Damage

Effects of whole-body cryotherapy (-110°C) on proprioception and indices of muscle damage.

Costello JT, Algar LA, Donnelly AE. *Scand J Med Sci Sports*. 2011 Apr 8. doi: 10.1111/j.1600-

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Cryotherapies (e.g., cold water immersion, ice packs) are extensively used in sports medicine with the aim of reducing symptoms, minimizing secondary hypoxic injury, etc. Recently, a new form of cryotherapy has gained attention within the sports medicine community: whole-body cryotherapy (WBC; for a narrative review on the topic [click here](#)).

WBC exposes the patient to very cold air (typically -110°C) for a short period of time (e.g., 2 to 3 minutes). It has been hypothesized that WBC can relieve pain, edema, inflammation (particularly with rheumatic diseases), improve recovery from muscle injury, and enhance recovery between training sessions. While very few papers have evaluated these claims in healthy participants (including athletes) the number of articles is beginning to grow.

The authors evaluated the immediate effects of WBC on proprioception (knee joint position sense and muscle force reproduction) and tympanic (ear) temperature as well as the effectiveness of WBC in the treatment of muscle soreness and function (maximal voluntary isometric contraction force, peak power output, muscle soreness questionnaire) following eccentric exercise damage.

Thirty-six healthy college-aged participants were randomized to receive WBC (-60°C for 20 seconds, then -110°C for 3 minutes) or control interventions (15°C for 3 minutes and 20 seconds). Both groups received 2 treatments separated by 2 hours (based on standard procedures). All of the participants completed the assessments in a random order before treatment, 2 to 3 minutes after treatment, and 15 minutes later (some of the tests were done after the first exposure and others after the second exposure). A subset of 18 participants also performed 100 high-force maximal eccentric contractions of the left knee extensors 24 hours before their treatment. Among this subset, maximal contraction force, peak power output, and muscle soreness were assessed before, 24, 48, and 72 hours after treatment.

WBC caused the tympanic temperature to decrease. However, proprioception and maximal contraction force were not different between the WBC group and controls. Furthermore, WBC did not influence maximal contraction force, peak power output, or muscle soreness following eccentric exercises.

Overall the study suggests that WBC does not impair proprioception or isometric muscle force but when it is administered 24 hours after a eccentric muscle damaging protocol it is not effective at reducing muscle soreness (self-reported) or measures reflective of muscle damage (maximal contraction force, peak power output). The authors note that further testing is needed to determine if other protocols (including when to initiate the treatment) could be effective and if prophylactic treatments may be beneficial. WBC is quickly becoming popular in some regions and much like our current arsenal of modalities it is important for us to carefully evaluate its safety and efficacy. Unlike pharmaceutical interventions, therapeutic modalities, which can have strong physiologic influences, are often embraced without vigorous phases of clinical trials. More studies like this one as well as larger randomized clinical trials should be performed to ensure that WBC is safe and appropriate for our patients. Does anyone have any experience with WBC? If so, what are your experiences?

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