

## Whole body cryotherapy and recovery from exercise induced muscle damage: A systematic review

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### ABSTRACT

#### Introduction

Cold therapies are used regularly in medicine for their analgesic and anti-inflammatory effects. Whole-body cryotherapy (WBC) involves exposure to air maintained between -110 and -160°C, and is hypothesised to reduce pain, local and systemic inflammation. WBC has recently become popular in an exercise and sporting context as a recovery method after skeletal muscle damage, however, research examining the efficacy of WBC in an athletic context is minimal. This review seeks to summarise the evidence for the effects of WBC on exercise recovery measures.

#### Methods

Electronic database searches were conducted from March to April 2013. Six large online databases were used; MEDLINE, SPORTDiscus, Scopus, Web of Science, PubMed and AMED. The search targeted human studies with an exercise task, and WBC intervention. Results included randomised controlled trials (RCT's), uncontrolled trials and crossover designs.

#### Results

A total of 8 studies were included in the review. Two RCT's, four crossover trials and two uncontrolled trials were identified. Five studies showed WBC had no effect on markers of muscle damage or inflammation post exercise, while 3 studies show a positive effect. Three out of the eight studies measured maximal muscle force production and subjective pain levels following exercise and WBC, with two showing WBC had a positive effect on muscle force recovery and pain. A meta-analysis was not conducted due to the heterogeneity of the studies.

#### Conclusion

The current evidence for the efficacy of WBC on exercise recovery is unclear. Published studies report mixed findings, and the study designs make these results difficult to interpret. As WBC is proposed as an aid to recovery in an athletic population, repeated measures of performance, muscle force production and pain are of importance to the athlete, however, are minimally reported in the literature. Cold water immersion (CWI) is widely used in an athletic setting for recovery, and has much literature supporting its use for the reduction of pain post-exercise. Well-designed RCT's with controlled exercise interventions targeting performance measures are needed, in particular comparison of WBC with CWI data is needed for evaluation.

