A Comparison of Cryotherapy and Intermittent Compression Therapy and Their Effect on Muscle Recovery Following Exercise

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Context: Optimizing recovery during training is beneficial for performing successive bouts of training or competition over a season without associated fatigue or overtraining effects. The inability to repeat the same level of performance in the days following intense training is frequently attributed to peripheral fatigue involving metabolite accumulation and muscle damage. Thus, various techniques have been suggested to accelerate the clearance of muscular damage or metabolite accumulations and optimize recovery. Cold water immersion (CWI) and intermittent pneumatic therapy (ICT) using extremity compression sleeves are two modalities commonly used to enhance recovery. However, at this time their efficacy is not fully understood and comparisons between the two have not been investigated.

Objective: To examine and compare the effects of CWI and ICT on recovery following a bout of intense exercise. Design: A randomized and counterbalanced single blind cross over design. Setting: Athletic training facility. Participants: Twelve healthy varsity athletes and recreationally active males and females (age=20 ±0.7 y, height=166.2 ±16.9 cm, mass=70.9 ±12.6 kg) who did not suffer from any contraindication to CWI or ICT volunteered. Interventions: Each participant reported to the facility for three sessions separated by a period of at least one week. At each session, the participants completed a drop jump protocol consisting of 100 drop jumps (5 sets of 20). The participants dropped off a 0.61-m platform with both legs and performed a maximal vertical jump in place immediately upon landing. A 10-s rest was provided between jumps and a 2-min rest between sets. Immediately following exercise, the participants completed one of three treatment conditions, CWI, ICT or control. The CWI condition consisted of immersion in 10°C water to the level of the iliac crests for 20-min. The ICT condition utilized the NormaTec MVP Recovery System (Normatec, Newton Center, MA) that was applied using manufacturer's instructions for a 20-min treatment. The control condition consisted of seated recovery with no modality for 20-min. Main Outcome Measures: General muscle soreness using a visual analogue scale (VAS), maximum vertical jump height (Vert\text{max}), 54.9-m shuttle time, and Yo-Yo intermittent recovery test (Yo-Yo IR1) performance were assessed immediately prior to and 24-h following the bout of exercise. Results: Muscle soreness was greater 24-h after exercise (F\text{1,11}=55.06, p=.001), however no treatment effect was observed. Likewise, Vert\text{max} (F\text{1,11}=10.28, p=.008) and 54.9-m shuttle time (F\text{1,11}=8.65, p=.013) performance declined 24-h following exercise however the treatment had no effect on these measures. In contrast, a significant decline in Yo-Yo IR1 (F\text{2,22}=4.77, p=.019) performance was observed following the CWI and control conditions, but not following ICT. Conclusions: While CWI and ICT did not appear to affect short duration anaerobic performance, ICT did provide improved recovery for aerobic performance. Thus, this treatment can be considered beneficial for training recovery. Word Count: 450.