Effects of infrared sauna, traditional sauna, and warm water immersion on accelerated exercise recovery and prevention of cell damage: an experimental study

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Abstract	The objectives of this study were to investigate the effects of single session infrared sauna, traditional sauna, warm water immersion, and passive recovery from fatigue and muscle cell damage in athletes and nonathletes. Eight male badminton athletes and eight male nonathletes participated in this study. The study participants were treated with submaximal physical activity assessed by ergometer, then recovered with different modalities. Each treatment was separated by one week of a resting period through a randomized crossover design. The recovery modalities of infrared sauna (IRS) were 45 +/- 2 degrees C, traditional sauna (TRS) 40 +/- 2 degrees C, warm water immersion (WWI) 40 +/- 2 degrees C, and passive recovery (PAS) for 20 minutes. Blood lactate, creatine kinase, blood glucose, heart rate, body temperature and level of pain were assessed, immediately after physical activity (pre), after recovery (post), and after 40 minutes of sitting (post-40min). Our findings indicated that the WWI and IRS were effective reducing fatigue in athletes and nonathletes. Moreover, PAS and TRS prevented muscle damage in nonathletes after 60 minutes of physical activity. All the thermal modalities decreased the BGL. The least amount of pain reported during the WWI modality, while the PAS modality tended to cause severe pain. Body temperature measurements were not significantly different among the modalities. According to our data, the WWI is more effective at increasing recovery and preventing muscle cell damage in athletes. Moreover, IRS and TRS are more effective for recovery in nonathletes. Further research needs to be conducted with different sports subjects, different types of exercise, different biomarkers, and physical performance tests.
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