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Infrared LED irradiation applied during high-intensity treadmill training improves maximal exercise tolerance in postmenopausal women: a 6-month longitudinal study.

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Source

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Abstract

Reduced aerobic fitness is associated with an increased risk of cardiovascular diseases among the older population. The aim of this study was to investigate the effects of LED irradiation (850 nm) applied during treadmill training on the maximal exercise tolerance in postmenopausal women. At the beginning of the study, 45 postmenopausal women were assigned randomly to three groups, and 30 women completed the entire 6 months of the study. The groups were: (1) the LED group (treadmill training associated with phototherapy, $n = 10$), (2) the exercise group (treadmill training, $n = 10$), and (3) the sedentary group (neither physical training nor phototherapy, $n = 10$). The training was performed for 45 min twice a week for 6 months at intensities between 85% and 90% maximal heart rate (HR(max)). The irradiation parameters were 39 mW/cm², 45 min and 108 J/cm². The cardiovascular parameters were measured at baseline and after 6 months. As expected, no significant differences were found in the sedentary group ($p \geq 0.05$). The maximal time of tolerance (Tlim), metabolic equivalents (METs) and Bruce stage reached significantly higher values in the LED group and the exercise group ($p < 0.01$). Furthermore, the HR, double product and Borg score at isotime were significantly lower in the LED group and in the exercise group ($p < 0.05$). However, the time of recovery showed a significant decrease only in the LED group ($p = 0.003$). Moreover, the differences between before and after training (delta values) for the Tlim, METs and HR at isotime were greater in the LED group than in the exercise group with a significant intergroup difference ($p < 0.05$). Therefore, the infrared LED irradiation during treadmill training can improve maximal performance and post-exercise recovery in postmenopausal women.

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