

Red (660 nm) and infrared (830 nm) low-level laser therapy in skeletal muscle fatigue in humans: what is better?

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Source

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Abstract

In animal and clinical trials low-level laser therapy (LLLT) using red, infrared and mixed wavelengths has been shown to delay the development of skeletal muscle fatigue. However, the parameters employed in these studies do not allow a conclusion as to which wavelength range is better in delaying the development of skeletal muscle fatigue. With this perspective in mind, we compared the effects of red and infrared LLLT on skeletal muscle fatigue. A randomized double-blind placebo-controlled crossover trial was performed in ten healthy male volunteers. They were treated with active red LLLT, active infrared LLLT (660 or 830 nm, 50 mW, 17.85 W/cm², 100 s irradiation per point, 5 J, 1,785 J/cm²) at each point irradiated, total 20 J irradiated per muscle) or an identical placebo LLLT at four points of the biceps brachii muscle for 3 min before exercise (voluntary isometric elbow flexion for 60 s). The mean peak force was significantly greater ($p < 0.05$) following red (12.14%) and infrared LLLT (14.49%) than following placebo LLLT, and the mean average force was also significantly greater ($p < 0.05$) following red (13.09%) and infrared LLLT (13.24%) than following placebo LLLT. There were no significant differences in mean average force or mean peak force between red and infrared LLLT. We conclude that both red than infrared LLLT are effective in delaying the development skeletal muscle fatigue and in enhancement of skeletal muscle performance. Further studies are needed to identify the specific mechanisms through which each wavelength acts.

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