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Low-level laser therapy and sodium diclofenac in acute inflammatory response induced by skeletal muscle trauma: effects in muscle morphology and mRNA gene expression of inflammatory markers.

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Abstract

Pharmacological therapy is widely used in the treatment of muscle injuries. On the other hand, **low-level laser** therapy (LLLT) arises as a promising nonpharmacological treatment. The aim of this study was to analyze the effects of sodium diclofenac (topical application) and LLLT on morphological aspects and gene expression of biochemical **inflammatory** markers. We performed a single trauma in tibialis anterior muscle of rats. After 1 h, animals were treated with sodium diclofenac (11.6 mg g(-1) of solution) or LLLT (810 nm; continuous mode; 100 mW; 3.57 W cm(-2) ; 1, 3 or 9 J; 10, 30 or 90 s). Histological analysis and quantification of gene expression (real-time polymerase chain reaction-RT-PCR) of cyclooxygenase 1 and 2 (COX-1 and COX-2) and tumor necrosis factor-alpha (TNF-α) were performed at 6, 12 and 24 h after trauma. LLLT with all doses improved morphological aspects of muscle tissue, showing better results than injury and diclofenac groups. All LLLT doses also decreased ($P < 0.05$) COX-2 compared to injury group at all time points, and to diclofenac group at 24 h after trauma. In addition, LLLT decreased ($P < 0.05$) TNF-α compared both to injury and diclofenac groups at all time points. LLLT mainly with dose of 9 J is better than topical application of diclofenac in acute inflammation after muscle trauma.

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