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Low-level laser therapy modulates pro-inflammatory cytokines after partial tenotomy.

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Abstract

Tendon injuries give rise to substantial morbidity, and current understanding of the mechanisms involved in tendon injury and repair is limited. This lesion remains a clinical issue because the injury site becomes a region with a high incidence of recurrent rupture and has drawn the attention of researchers. We already demonstrated that low-level laser therapy (LLLT) stimulates the synthesis and organization of collagen I, MMP-9, and MMP-2 and improved the gait recovery of the treated animals. The aim of this study was to evaluate the effects of LLLT in the nitric oxide and cytokines profile during the inflammatory and remodeling phases. Adult male rats were divided into the following groups: G1-intact, G2-injured, G3-injured + LLLT (4 J/cm^2 continuous), G4-injured + LLLT (4 J/cm^2-20 Hz-pulsed laser). According to the analysis, the animals were euthanized on different dates (1, 4, 8, or 15 days after injury). ELISA assay of TNF-α, IL-1β, IL-10, and TGF-β was performed. Western blotting of isoform of nitric oxide synthase (i-NOS) and nitric oxide dosage experiments was conducted. Our results showed that the pulsed LLLT seems to exert an anti-inflammatory effect over injured tendons, with reduction of the release of proinflammatory cytokines, such as TNF-α and the decrease in the i-NOS activity. Thanks to the painreduction and the facilitation of movement, there was a stimulation in the TGF-β and IL-1β release. In conclusion, we believe that pulsed LLLT worked effectively as a therapy to reestablish the tendon integrity after rupture.

KEYWORDS:

IL-1β; Inflammatory; TGF-β; TNF-α; i-NOS

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