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Program Book



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LOW-LEVEL LASER REDUCES INFLAMMATION-INDUCED COX-2 AND P53 ACCUMULATION IN RATS WITH CHRONIC NERVE CONSTRICTION INJURY

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ABSTRACT

Background and Purpose: Nerve inflammation plays an important role in the development and progression of neuropathic pain after chronic constrictive injury (CCI). Among the therapeutic approaches to attenuate inflammation and increase tissue repair, low-level laser therapy (LLLT) may be a safe and effective clinical procedure. The aim of this study was to evaluate the effects of LLLT on inflammatory mediators, COX-2 and tumour suppressor protein p53 (p53), produced during a CCI of sciatic nerve in rats.

Materials/Methods: Sprague-Dawley rats were randomly divided into four groups: CCI with LLLT (CL group), CCI with sham-LLLT (CsL group), sham-CCI with LLLT (sCL group) and sham-CCI with sham-LLLT (sCsL group). The injured region was irradiated daily for 1, 2 and 3 weeks, starting at the 7th day after CCI surgery using a GaAlAs laser (continuous wave, 660 nm, tip area of 0.2 cm², power 30 mW, application time 60 seconds, energy density 9 J/cm²). The animals were sacrificed after treatments and then sciatic nerve segments were harvested. Effects of LLLT in CCI animals were determined by pain behavioral assessments, histopathological examination, and Western blot immunoassays for COX-2 and p53.

Results: In CL group, the paw withdrawal threshold was significantly improved after LLLT treatment. The CCI-induced accumulations of COX-2 and p53 were also suppressed by LLLT.

Conclusions and Clinical Relevance: LLLT modulates neuropathic pain and inflammation by reducing the inflammation-induced accumulations of COX-2 and p53. Findings suggest that LLLT as a conservative treatment is effective in treating neuropathic pain and peripheral neuropathy.