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Effect of photobiomodulation therapy (808 nm) in the control of neuropathic pain in mice

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Abstract

Neuropathic pain can be defined as the pain initiated or caused by a primary lesion or dysfunction of the central or peripheral nervous system. Photobiomodulation therapy (PBM) stands out among the physical therapy resources used for analgesia. However, application parameters, especially the energy density, remain controversial in the literature. Therefore, this study aimed to investigate the PBM effect, in different energy densities to control neuropathic pain in mice. Fifty (50) mice were induced to neuropathy by chronic constriction surgery of the sciatic nerve (CCI), treated with PBM (808 nm), and divided into five groups: GP (PBM simulation), GS (sham), GL10, GL20, GL40 (energy density of 10, 20, and 40 J/cm², respectively). The evaluations were carried out using the hot plate test and Randall and Selitto test, before and after the CCI surgery, every 15 days during the 90 days experiment. β -Endorphin blood dosage was also tested. For both the hot plate and Randall and Selitto tests, the GL20 and GL40 groups presented reduction of the nociceptive threshold from the 30th day of treatment, the GL10 group only after day 75, and the GP group did not show any improvement throughout the experiment. The β -endorphin dosage was higher for all groups when compared to the GP group. However, only the GL20 group and GL40 presented a significant increase. This study demonstrates that PBM in higher energy density (20, 40 J/cm²) is more effective in the control of neuropathic pain.

Keywords: Laser therapy; Nerve injury; Pain control.

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