

Analgesic Effect of He-Ne (632.8 nm) Low-Level Laser Therapy on Acute Inflammatory Pain

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Abstract

Objective: The aim of this study was to evaluate the analgesic effect of the low level laser therapy (LLLT) with a He-Ne laser on acute inflammatory pain, verifying the contribution of the peripheral opioid receptors and the action of LLLT on the hyperalgesia produced by the release of hyperalgesic mediators of inflammation.

Background Data: All analgesic drugs have undesired effects. Because of that, other therapies are being investigated for treatment of the inflammatory pain. Among those, LLLT seems to be very promising.

Materials and Methods: Male Wistar rats were used. Three complementary experiments were done. (1) The inflammatory reaction was induced by the injection of carrageenin into one of the hind paws. Pain threshold and volume increase of the edema were measured by a pressure gauge and plethysmography, respectively. (2) The involvement of peripheral opioid receptors on the analgesic effect of the laser was evaluated by simultaneous injection of carrageenin and naloxone into one hind paw. (3) Hyperalgesia was induced by injecting PGE₂ for the study of the effect of the laser on the sensitization increase of nociceptors. A He-Ne laser (632.8 nm) of 2.5 J/cm² was used for irradiation.

Results: We found that He-Ne stimulation increased the pain threshold by a factor between 68% and 95% depending on the injected drug. We also observed a 54% reduction on the volume increase of the edema when it was irradiated.

Conclusion: He-Ne LLLT inhibits the sensitization increase of nociceptors on the inflammatory process. The analgesic effect seems to involve hyperalgesic mediators instead of peripheral opioid receptors.