Inhibitory effects of visible 650-nm and infrared 808-nm laser irradiation on somatosensory and compound muscle action potentials in rat sciatic nerve: implications for laser-induced analgesia

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Abstract:

Low-level laser therapy (LLLT) has been shown in clinical trials to relieve chronic pain and the World Health Organization has added LLLT to their guidelines for treatment of chronic neck pain. The mechanisms for the pain-relieving effects of LLLT are however poorly understood. We therefore assessed the effects of laser irradiation (LI) on somatosensory-evoked potentials (SSEPs) and compound muscle action potentials (CMAPs) in a series of experiments using visible ([lambda] = 650 nm) or infrared ([lambda] = 808 nm) LI applied transcutaneously to points on the hind limbs of rats overlying the course of the sciatic nerve. This approximates the clinical application of LLLT. The 650-nm LI decreased SSEP amplitudes and increased latency after 20 min. CMAP proximal amplitudes and hip/ankle (H/A) ratios decreased at 10 and 20 min with increases in proximal latencies approaching significance. The 808-nm LI decreased SSEP amplitudes and increased latencies at 10 and 20 min. CMAP proximal amplitudes and H/A ratios decreased at 10 and 20 min. Latencies were not significantly increased. All LI changes for both wavelengths returned to baseline by 48 h. These results strengthen the hypothesis that a neural mechanism underlies the clinical effectiveness of LLLT for painful conditions.