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Effect of Diode Laser in the Treatment of Patients with Nonspecific Chronic Low Back Pain: A Randomized Controlled Trial

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Abstract

Background data: Low back pain is a common, highly debilitating condition, whose severity is variable. This study evaluated the efficacy of treatment with Ga-Al-As diode laser (980 nm) with a large diameter spot (32 cm^2), in association with exercise therapy, in reducing pain. ***Objective:*** The present study aimed to evaluate the pain reduction efficacy of treatment with the Ga-Al-As diode laser (980 nm) in combination with exercise therapy, in patients with chronic low back pain (CLBP). ***Methods:*** This study evaluated 100 patients with CLBP (mean age 60 years) who were randomly assigned to two groups. The laser plus exercises group (Laser + EX: 50 patients) received low-level laser therapy (LLLT) with a diode laser, 980 nm, with a specific handpiece [32 cm^2 irradiation spot size, power 20 W in continuous wave (CW), fluence 37.5J/cm^2, total energy per point 1200 J] thrice weekly, and followed a daily exercise schedule for 3 weeks (5 days/week). The exercises group (EX: 50 patients) received placebo laser therapy plus daily exercises. The outcome was evaluated on the visual analogue pain scale (VAS), before and after treatment. ***Results:*** At the end of the 3 week period, the Laser + EX group showed a significantly greater decrease in pain than did the EX group. There was a significant difference between the two groups, with average Δ VAS scores of 3.96 (Laser + EX group) and 2.23 (EX group). The Student's t test demonstrated a statistically significant difference between the two groups, at $p < 0.001$. ***Conclusions:*** This study demonstrated that the use of diode laser (980 nm) with large diameter spot size, in association with exercise therapy, appears to be effective. Such treatment might be considered a valid therapeutic option within rehabilitation programs for nonspecific CLBP.

Introduction

Chronic low back pain (CLBP) was defined by van Tulder in 1998 as pain in the lumbosacral area of the spine of >12 weeks' duration, which may or not have the characteristics of limiting the patient's range of movements.[1] The etiopathology of this form of pain is not specific; however, it is often related to disc degeneration or other spinal disorders. It is a major cause of morbidity and affects 80–85% of people at some time during their lifetime.[2] The severity of symptoms is variable; some are self-limiting, others require therapy, and others again require emergency room treatment.

The main goal of CLBP therapy is rarely the complete eradication of pain. Because of the etiopathology of this disorder, there may be many underlying causes, and often no specific cause can be found. Management of CLBP can choose from a range of different strategies, including surgery and drug therapy, together with nonmedical interventions including exercise therapy, manipulation, acupuncture, electrical treatments, and cognitive-behavioral interventions. During recent years, a large number of randomized controlled trials have been published. It currently appears that the ideal treatment for CLBP is a multidisciplinary intervention with a stepwise approach; studies examining the effectiveness of this approach are now numerous.[3–5]

In a systematic review, Marienke et al.[3] analyzed 83 clinical trials on physical therapy and rehabilitation for CLBP; they suggest that the only treatments that are effective in reducing CLBP are multidisciplinary treatment and behavioral therapy. Treatment with low-laser level therapy (LLLT) has given contrasting results; Jang et al. conducted a meta-analysis on the pain relief effects of laser irradiation, and

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