

Laser Therapy Effective for Reducing Neck Pain

Reduces acute pain immediately, chronic pain up to 22 weeks following treatment, concludes literature review.

By Peter W. Crownfield, Executive Editor

A literature review and meta-analysis of randomized placebo or active-treatment controlled trials concludes that low-level laser therapy "reduces pain immediately after treatment in acute neck pain and up to 22 weeks after completion of treatment in patients with chronic neck pain" and compares favorably with other forms of therapy for neck pain - particularly pharmacological interventions.¹ The authors of the review study, published in the *Lancet*, note that clinical benefits take place when laser therapy is administered as a stand-alone treatment or in conjunction with an exercise/stretching program, and that adverse effects from treatment are mild and similar to placebo.

Inclusion Criteria

Researchers identified 16 randomized, controlled trials suitable for inclusion after conducting a comprehensive database search that included Medline (January 1966 - July 2008), Embase (January 1980 - July 2008), Cinahl (January 1982 - July 2008), the Physiotherapy Evidence Database (January 1929 - July 2008), Biosis (January 1926 - July 2008), Allied and Complementary Medicine (January 1985 - July 2008), and the Cochrane Central Register of Controlled Trials (second quarter of 2008).

Inclusion criteria included abstracts/studies for which neck pain outcomes measures could be distinguished from outcomes data for other areas of the body; abstracts/studies in which investigators utilized "a laser device that delivered irradiation to points in the neck identified by tenderness, local acupuncture points, or on a grid at predetermined points overlying the neck; and abstracts/studies with control groups that received either 1) placebo laser treatment with an identical laser device as the treatment group, but with the emission function deactivated, or 2) active treatment such as exercise.

Study Parameters

Of the 16 qualifying studies, 14 reported the effect of laser therapy on chronic, nonspecific neck pain without radiculopathy, while two reported on laser therapy for acute neck pain - one treating acute whiplash-associated disorders and one treating acute neck pain without defined cause. Nearly 80 percent of the 820 patients included in the chronic pain studies were women, with a mean age of 43 years, symptom duration of 90 months and baseline pain of 56.9 mm on a 100 mm VAS. Frequency of treatment in all studies ranged from one application only (830 nm wavelength, continuous wave) to six treatments per week for up to five weeks (904 nm wavelength, pulsed). The longest treatment plan noted in any study was seven weeks (twice-weekly treatments); the most treatments administered were 30 (six per week for five weeks).

Effect size for pain intensity, the primary outcome measure, was defined as a "pooled estimate of mean difference in change in mm on a 100 mm visual analogue scale." In analyzing the qualifying studies, the reviewers considered five levels of evidence to describe the strength of the treatment effect: strong evidence (consistent findings in several high-quality trials), moderate evidence (findings from one high-quality trial or consistent findings in several low-quality trials), limited evidence (findings from one low-quality trial), unclear evidence (inconsistent or contradictory results in several trials), and no evidence (no studies identified).

Weighing the Evidence

After analyzing the 16 studies, the reviewers determined that in the two acute-pain studies, subjects receiving low-level laser therapy "had a significant RR [relative risk] of 1.69 ... for improvement immediately after treatment versus placebo." For the 14 studies investigating chronic neck pain, reviewers determined that relative risk for pain improvement with low-level laser therapy was 4.05 compared to placebo by the end of the treatment period. Moreover, seven studies providing follow-up data 1-22 weeks following the conclusion of treatment showed that "the pain-relieving effect in the short term (<1 month) persisted into the medium term (up to six months)" and that for chronic pain, there was an "average reduction in visual analogue scale [scores] of 19.86 mm, which is a clinically important change." Compared with placebo, adverse effects seen in the treatment groups were similar and mild for all studies reviewed.

"Whatever the mechanism of action, clinical benefits of LLLT occur both when LLLT is used as monotherapy and in the context of a regular exercise and stretching programme," the reviewers conclude. "In clinical settings, combination with an exercise programme is probably preferable. The results of LLLT

in this review compare favourably with other widely used therapies, and especially with pharmacological interventions, for which evidence is sparse and side-effects are common."

Reference

1. Chow RT, Johnson MI, Lopes-Martins RAB, Bjordal JM. Efficacy of low-level laser therapy in the management of neck pain: a systematic review and meta-analysis of randomized placebo or active-treatment controlled trials. *Lancet*, 2009;374:1897-1908.



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