Clinical effectiveness of laser acupuncture: a systematic review
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CRD summary
The authors concluded that there appeared to be support for use of laser acupuncture for myofascial pain, postoperative nausea and vomiting, and chronic tension headache. Overall the authors' conclusions are likely to be reliable, although there were limitations in the review methods and the conclusions were based on a small number of studies for some conditions.

Authors' objectives
To examine the effectiveness of laser acupuncture as the primary intervention.

Searching
SPORTDiscus, MEDLINE, EMBASE, CINAHL, British Nursing Index and AMED were searched for studies published in English over dates that ranged from 1960 to September 2005. Search terms were reported. More limited searches were undertaken on PEDro and Acubriefs using one keyword. Related articles in PubMed were tracked, reference lists of primary studies and reviews were screened and the journal Laser Surgery Medicine was searched.

Study selection
Randomised controlled trials (RCTs) that evaluated laser acupuncture as the primary intervention in adults (aged >18 years) with soft tissue injury, an acute or chronic pain condition or any systemic illness were eligible for inclusion. Cross-over studies were excluded. The review defined laser acupuncture as low intensity laser radiation to classical meridian or trigger points. Studies of needling, acupressure and sham laser acupuncture were excluded. Studies had to compare laser acupuncture with no treatment, placebo or sham laser, other sham procedure or other therapeutic intervention. Studies had to assess pain intensity or a global measure of patient improvement or an appropriate outcome for a non-painful condition. The primary focus of the review was musculoskeletal pain.

Included studies involved patients with the following conditions: fibromyalgia; musculoskeletal pain; myofascial pain/musculoskeletal pain; lateral epicondylitis; postoperative nausea and vomiting; smoking cessation; nocturnal enuresis; interstitial cystitis; and headache. Some studies were in children. Studies used different irradiation parameters.

One reviewer selected studies.

Assessment of study quality
Two reviewers independently assessed validity using the van Tulder scale. Disagreements were resolved by discussion with the help of a third reviewer if required. Studies that scored 6 or more out of 11 possible points were classified as high quality.

Data extraction
One reviewer extracted means and standard deviations. Where possible standardised mean differences (SMD) with 95% confidence intervals (CI) were calculated for continuous data and risk ratios (RR) were calculated for dichotomous data.

Two reviewers independently extracted details about laser interventions. One reviewer then assessed accuracy and clinical appropriateness of the laser treatment dose and adequacy of the acupuncture point.

Methods of synthesis
Studies were grouped by medical condition and combined in a narrative synthesis. The level of evidence for laser acupuncture in each condition was classified according to hierarchy of evidence as strong, moderate, limited, conflicting or weak.
Results of the review
Eighteen RCTs were included (n=1,169). Sample size range from 24 to 268; sample size was less than 70 for all except two studies. Five studies were classified as high quality. None of the studies reported adequate allocation concealment or intention-to-treat analysis. Three reported adequate randomisation methods. Four studies did not provide adequate results data for analysis.

Musculoskeletal pain: There was moderate evidence for use of laser acupuncture in myofascial pain/musculoskeletal pain. Seven out of nine studies reported positive outcomes. Two studies reported no significant difference between active and placebo irradiation (the authors stated that both of these studies were estimated as using inappropriate laser power outputs and dosages). There was insufficient evidence for use of laser acupuncture in lateral epicondyliitis. Three studies reported no significant difference between intervention and placebo.

Other medical conditions: There was moderate evidence for use of laser acupuncture applied to the P6 point to reduce postoperative nausea and vomiting. Two studies reported a significant effect of laser acupuncture in children. There was limited evidence for use of laser acupuncture in chronic tension headache. One study reported a significant effect of the intervention compared to placebo. There was insufficient evidence for use of laser acupuncture in: smoking cessation (one study reported no significant difference between intervention and placebo); nocturnal enuresis (one study reported no significant difference between intervention and medication); and interstitial cystitis (one study reported no significant difference between intervention and placebo).

Authors' conclusions
There appeared to be support for use of laser acupuncture for myofascial pain, postoperative nausea and vomiting, and chronic tension headache.

CRD commentary
The review question was clear and supported by appropriate inclusion criteria. However, criteria for participants (adults>18 years) were not adhered to (studies of children were included). Several relevant sources were searched, but no attempts were made to minimise publication and language biases. Methods were used to minimise reviewer error and bias in assessment of validity, but only one reviewer selected studies and extracted results data and so reviewer error and bias could not be ruled out. Validity was assessed and results were reported. The statistical significance of treatment differences was reported, but not results data and so it was not possible to verify findings reported in the review. Studies were appropriately combined in a narrative synthesis and differences between studies were discussed with respect to the appropriateness of the laser intervention characteristics. There were limitations in the review methods, but overall the authors' conclusions reflected the evidence presented and are likely to be reliable. It should be borne in mind that the conclusions were based on a small number of studies in some groups.

Implications of the review for practice and research
Practice: The authors stated that laser acupuncture could be considered an alternative treatment for myofascial pain (when used with a power of at least 10mW and a dosage of 0.5J per point).

Research: The authors did not state any implication for research.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.