

## CRITIQUE OF A COCHRANE REVIEW

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#### ABSTRACT OF THE COCHRANE REVIEW

**Background:** This review is one in a series of reviews of interventions for lateral elbow pain. Lateral elbow pain, or tennis elbow, is a common condition causing pain in the elbow and forearm as well as a lack of strength and function of the elbow and wrist. Acupuncture has long been used to treat lateral elbow pain in China, and in Western countries, practitioners and consumers are increasingly exploring acupuncture as a first-line treatment for musculoskeletal disorders. No previous systematic review of the available evidence has been conducted to determine whether acupuncture is efficacious in the treatment of lateral elbow pain.

**Objectives:** To determine the effectiveness of acupuncture in the treatment of adults with lateral elbow pain with respect to pain reduction, improvement in function and grip strength, and adverse effects.

**Search Strategy:** MEDLINE, CINAHL, EMBASE, SCISEARCH, the Cochrane Clinical Trials Register, and the Musculoskeletal Review Group's specialist trial database were searched from 1966 to June 2001.

**Selection Criteria:** Two independent reviewers assessed all identified trials against predetermined inclusion criteria. Randomized and pseudo randomized trials in all languages were included in the review, provided they were testing acupuncture compared with placebo or another intervention in adults with lateral elbow pain (tennis elbow). Outcomes of interest were pain, function, disability, quality of life, strength, participant satisfaction with treatment, and adverse effect.

**Data Collection and Analysis:** Means and standard deviations for continuous variables were extracted or imputed to allow the analysis of weighted mean difference, and binary data numbers of events and total population were analyzed and interpreted as relative risks. Trial results were combined only in the absence of clinical and statistical heterogeneity.

**Main Results:** Four, small, randomized, controlled trials were included, but because of flaws in study designs (particularly small populations, uncertain allocation concealment and substantial loss to follow-up) and clinical differences between trials, data from trials could not be combined in a metaanalysis. One randomized controlled trial found that needle acupuncture results in relief of pain for significantly longer than placebo (weighted mean difference = 18.8 hours, 95% CI: 10.1-27.5) and is more likely to result in a 50% or greater reduction in pain after one treatment (relative risk [RR] 0.33, 95% CI: 0.16-0.69).<sup>1</sup> A second randomized controlled trial demonstrated needle acupuncture to be more likely to result in overall participant-reported improvement than placebo in the short-term (RR = 0.09, 95% CI: 0.01-0.64).<sup>2</sup> No significant differences were found in the longer term (after three or 12 months). A randomized controlled trial of laser acupunc-

tuncture versus placebo demonstrated no differences between laser acupuncture and placebo with respect to overall benefit.<sup>3</sup> A fourth included trial published in Chinese demonstrated no difference between vitamin B-12 injection plus acupuncture and vitamin B-12 injection alone.<sup>4</sup>

**Conclusions:** There is insufficient evidence to either support or refute the use of acupuncture (either needle or laser) in the treatment of lateral elbow pain. This review has demonstrated needle acupuncture to be of short-term benefit with respect to pain, but this finding is based on the results of two small trials, the results of which were not able to be combined in metaanalysis. No benefit lasting more than 24 hours following treatment has been demonstrated. No trial assessed or commented on potential adverse effect. Further trials, utilizing appropriate methods and adequate sample sizes, are needed before conclusions can be drawn regarding the effect of acupuncture on tennis elbow.

#### CRITIQUE OF COCHRANE REVIEW

Green et al's review<sup>5</sup> of acupuncture for lateral epicondyle pain followed the rigorous Cochrane protocol for systematic reviews. Overall, the review was very well conducted. Three areas deserve special consideration: articles not identified through their comprehensive search, synthesis of evidence from heterogeneous studies, and expectations of the length of treatment effectiveness.

When we first read the Green et al review in 2002, we were surprised that they identified only three randomized or pseudo-randomized studies evaluating acupuncture for elbow pain. At that point, we heard of Grua et al's work<sup>6</sup> from my colleague in Italy and were able to identify this paper through our search. We also have a copy of Imich et al's<sup>7</sup> work because one of the authors of this study is a colleague of K.T. in the Cervical Overview Group. This paper remained unpublished

**Table 1.** Description of Criteria for Evidence Levels

Evidence Level	Criteria for Level
Strong evidence	Consistent findings in multiple high-quality RCTs
Limited evidence	Finding in a single low-quality RCT
Conflicting evidence	Inconsistent results in multiple RCTs
No evidence	No studies were identified

for various reasons until 2003. Davidson et al's study<sup>8</sup> was identified by a Medline search alone. We heard of Fink et al's studies<sup>9</sup> during casual conversations with colleagues at acupuncture research meetings. Green et al conducted their search up to June 2001. In reviewing the author list in Green et al's paper, we do not recognize any of these authors as being regular attendees at international acupuncture conferences. It may be helpful in future acupuncture Cochrane reviews to include an author actively involved in acupuncture research or literature.

The second area involved synthesizing the evidence. Green et al determined that the two small studies they found could not be meta-analyzed. Even with the larger number of studies we found, they were too heterogeneous for meta-analysis in our opinion. Therefore, it is more appropriate to use the best evidence synthesis approach. This method has been used in many Cochrane reviews and protocols.<sup>10,11</sup> It synthesizes the evidence in terms of the strength of the evidence,<sup>12</sup> as described in Table 1.

Confusion may arise with this approach. The strength of evidence for the effectiveness of a therapy is based on the consistency of evidence of high- or low-quality randomized controlled trials (RCTs).

The fact that there is strong evidence for the effectiveness of a therapy does not mean that the therapy has a strong effect. Quite the contrary, many of the therapies found for musculoskeletal pain in the Cochrane database have small therapeutic effects. The definition of consistency is often arbitrary, and vote counting is discouraged. Experts are asked to examine the estimates on the forest plot and arrive

at a global impression of treatment effectiveness. With respect to study quality, reviewers should use quality-assessment tools that are valid and reliable. There are many quality-assessing tools available, but very few have been validated or have any reliability data. Despite these shortcomings, the best evidence synthesis approach is a common method used to synthesize evidence in light of heterogeneity.

Heterogeneity can be broadly classified into design, statistical, and clinical heterogeneity. Design heterogeneity can be minimized by including only randomized and pseudo-randomized studies. Pseudo-randomized studies can still be classified as "high" quality studies according to the Jadad scale, provided that blinding and withdrawal/dropout recordings are conducted appropriately. Statistical heterogeneity reflects issues in clinical and design heterogeneity, as opposed to the homogeneity of the statistical tests. Personal judgment determines the appropriateness of performing a meta-analysis by evaluating clinical issues such as the patient population, the interventions, and the outcomes measured.

The issues with clinical heterogeneity have already been discussed at length in our elbow review<sup>13</sup> and will be summarized here.

A consistent definition of lateral epicondyle pain does not exist in the literature. Without it, the population in the studies was likely heterogeneous with regard to the cause of the pain and the condition itself.

The intervention was also heterogeneous. Although acupuncture was used as the primary intervention in all of the studies, how the intervention was administered appeared to be different in terms of dosing, including the total number of treatments, frequency and duration of treatments, number of needles being used, type of acupuncture (classical vs anatomical), and others. Furthermore, there is currently much debate regarding what defines a reasonable sham control.<sup>14</sup> Sham acupuncture might in fact produce nonspecific analgesic effects. According to Ezzo et al,<sup>15</sup> the proportion of improvement reported by the sham groups was significantly higher than the inert placebo groups. Research is ongoing to help give clearer guidance for the selection of appropriate sham controls.<sup>16-18</sup>

Another source of heterogeneity was the outcomes used among the studies. There was no uniform definition of pain relief or improvement. In particular, the definition of short-term pain alleviation varied from immediately following a single treatment to three months after a series of treatments. Although pain relief is an important measure, it is subjective. More objective measures, such as recovery of function and return to work, are important to quantify. Insurance and medical coverage are also important to consider, especially when using "return to work" as an outcome measure.

Finally, reviewers for acupuncture should be comparing acupuncture with conventional therapies. For example, with the exception of trigger-point injection, we found that there was very little evidence to support the use of medicine or injections for chronic neck pain in our series of Cochrane neck reviews.<sup>19</sup> It is perhaps unrealistic to expect several doses of nonsteroidal antiinflammatory drugs (NSAIDs) to produce long-lasting effects for chronic conditions such as lateral epicondylitis. Likewise with acupuncture treatments: expecting a few treatments to have a long-lasting benefit is perhaps too unrealistic.

## REFERENCES

1. Molsberger A, Hille E. The analgesic effect of acupuncture in chronic tennis elbow pain. *Br J Rheumatol*. 1994;33:1162-1165.
2. Haker E, Lundeberg T. Acupuncture treatment in epicondylalgia: a comparative study of two acupuncture techniques. *Clin J Pain*. 1990;6:221-226.
3. Haker E, Lundeberg T. Laser treatment applied to acupuncture points in lateral humeral epicondylalgia: a double-blind study. *Pain*. 1990;43:243-247.
4. Wang Y. Acupuncture and injection for the treatment of tennis elbow: 30 cases. *Shanghai Acupunct J*. 1997;16:20.
5. Green S, Buchbinder R, Barnsley L, et al. Acupuncture for lateral elbow pain. *Cochrane Database Syst Rev*. 2002;1: CD003527.
6. Grua D, Mattioda A, Quirico P, Lupi G, Allais G. L'agopuntura nel trattamento dell'epicondilitis laterale: valutazione dell'efficacia e confronto con ultrasonoterapia. [Acupuncture in the treatment of lateral epicondylitis: evaluation of the effectiveness and comparison with ultrasound therapy]. *G Ital Rflessot Agopunt*. 1999;11:63-69.

7. Irnich D, Karg H, Behrens N, et al. Controlled trial on point specificity of acupuncture in the treatment of lateral epicondylitis (tennis elbow). *Phys Med Rehab Kurors.* 2003;13:215-219.
8. Davidson JH, Vandervoort A, Lessard L, Miller L. The effect of acupuncture versus ultrasound on pain level, grip strength and disability in individuals with lateral epicondylitis: a pilot study. *Physiother Can.* 2001; 53:195-202.
9. Peloso P, Gross A, Haines T, Trinh K, Goldsmith CH, Aker P, Cervical Overview Group. Medicinal and injection therapies for mechanical neck disorders. *Cochrane Database Syst Rev.* 2005;2:CD000319.
10. Peloso P, Gross A, Haines T, Trinh K, Goldsmith C, Aker P. Medicines and injections for neck pain: a systematic review. *J Pain.* 2004;5:S1-S83.
11. Trinh K, Kay T, Graham N, Goldsmith C, Gross A, Cervical Overview Group. *Acupuncture for Mechanical Neck Disorders* (Protocol for a Cochrane Review). Issue 3. In *The Cochrane Library*. Chichester, UK: John Wiley & Sons, Ltd; 2004.
12. Sackett DL, Straus SE, Richardson WS, et al. *Evidence-Based Medicine: How to Practice and Teach EBM.* 2nd ed. Edinburgh, UK: Churchill Livingstone; 2000.
13. Trinh KV, Phillips SD, Ho E, Damsma K. Acupuncture for the alleviation of lateral epicondyle pain: a systematic review. *Rheumatology.* 2004;43:1085-1090.
14. Trinh K. The challenges of nonpharmacological trials: blinding and other issues using acupuncture research as an example. *Drug Information J.* 2002;36:509-511.
15. Ezzo J, Berman B, Hadhazy VA, Jadad AR, Lao L, Singh BB. Is acupuncture effective for the treatment of chronic pain? A systematic review. *Pain.* 2000;86:217-225.
16. Streitberger K, Kleinhenz J. Introducing a placebo needle into acupuncture research. *Lancet.* 1998;352:364-365.
17. White AR, Ernst E. A systematic review of randomized controlled trials of acupuncture for neck pain. *Rheumatology.* 1999;38: 143-147.
18. Park J, White A, Lee H, Ernst E. Development of a new sham needle. *Acupunct Med.* 1999;17:110.
19. Peloso P, Haines T, Gross A, Trinh K, Goldsmith CH, Aker P, Cervical Overview Group. *Medicinal and Injection Therapies for Mechanical Neck Disorders.* In *The Cochrane Library*. Chichester, UK: John Wiley & Sons, Ltd; 2004.

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