Effectiveness of corticosteroid injections compared with physiotherapeutic interventions for lateral epicondylitis: a systematic review

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CRD summary
The authors concluded that corticosteroid injections were effective in the short term, and that physiotherapeutic interventions were effective in the intermediate and long term in treating patients with lateral epicondylitis (tennis elbow), although these conclusions should be interpreted with caution. Due to the limited evidence presented and potential biases in the search strategy, the authors' cautious recommendation appears to be justified.

Authors' objectives
To evaluate the effectiveness of corticosteroid injections compared with physiotherapeutic interventions in patients with lateral epicondylitis (tennis elbow).

Searching
MEDLINE, CINAHL, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), AMED, SPORTDiscus, and the Physiotherapy Evidence Database (PEDro), were searched for published English-language articles from 1966 to March 2009. Search terms were reported. The meta-register of controlled clinical trials was also searched. Reference lists of identified studies were screened for additional articles.

Study selection
Randomised controlled trials (RCTs) of patients (aged at least 18 years) diagnosed with lateral epicondylitis, and receiving corticosteroid injections or a physiotherapeutic intervention, were eligible for inclusion in the review. Physiotherapeutic interventions could be ultrasound, electrotherapy, frictions, taping, acupuncture, mobilisations, manipulations, exercises, home exercise programmes, and mills manipulation. Trials had to include at least one clinically relevant and validated measure of outcome (for example, pain severity, pain-free or maximum grip strength, elbow disability, and global improvement) and followed up for at least six weeks.

The mean age of included male and female patients ranged from 43 to 48.6 years (where reported). The average duration of tennis elbow varied, as did the characteristics of physiotherapeutic interventions. Triamcinolone was administered as part of the injection intervention in the majority of included trials, but the injection site, strength of local anaesthetic, and number of injections varied. A number of different outcome measurements and assessment tools were reported, although variations in pain and grip strength were assessed in all trials.

The review authors independently selected the studies for inclusion.

Assessment of study quality
Trial quality was assessed using the PEDro scale, which included randomisation, baseline comparability, allocation concealment, blinding, follow-up, and intention-to-treat analysis. Trials were scored out of a maximum of 10.

The quality assessment was carried out independently by the review authors, and disagreements were resolved by consensus.

Data extraction
Data were extracted to enable the calculation of standardised mean differences (SMD) and 95% confidence intervals (CI), where possible in the short term (three to six weeks), intermediate term (six and 26 weeks), and long term (52 weeks).

Data extraction was carried out independently by the review authors.

Methods of synthesis
Where possible, standardised mean differences and 95% confidence intervals were pooled in a meta-analysis using
fixed-effect and random-effects models. A descriptive synthesis was also undertaken, where appropriate. For the analysis, the corticosteroid injection groups were classed as the experimental group, and data from the physiotherapeutic or "wait and see" groups were classed as the control group. Data from physiotherapeutic intervention groups were classed as the experimental group where this was compared only with control.

**Results of the review**

Five RCTs were included in the review (597 patients). Two RCTs (383 patients) measuring pain-free grip strength and assessor's rating of severity were included in the meta-analysis. These scored 8 out of 10 on the PEDro scale. Two of the remaining three trials scored 7, and one trial scored 4. All included trials used some method of randomisation; the majority were comparable at baseline and reported adequate follow-up. Blinding was not present due to the nature of the interventions. Intention-to-treat analysis was used in three trials.

The meta-analysis (two RCTs) showed that corticosteroid injections were more effective than physiotherapeutic interventions in the short term for pain-free grip strength (SMD range 0.55 to 1.29) and rating of severity (SMD range 0.65 to 1.26). Injections were less effective than physiotherapeutic interventions at the intermediate and long-term follow-up for pain free grip strength (SMD range -0.37 to -0.72) and rating of severity (SMD range -0.32 to -0.5). Pooled standardised mean differences with 95% confidence intervals, using fixed-effect and random-effects models, were presented in graphs, but not reported numerically. Physiotherapeutic interventions were more effective than "wait and see" control groups at short-term and long-term follow-up periods.

When all trials were included in the analysis, results were in favour of using corticosteroid injections in the short term (three to seven weeks). Recurrence rates ranged from 34 to 74% (three trials).

**Authors’ conclusions**

Corticosteroid injections were effective in the short term, and physiotherapeutic interventions were effective in the intermediate and long term in treating patients with lateral epicondylitis (tennis elbow). These conclusions should be interpreted with caution.

**CRD commentary**

The review addressed a clear question and this was supported by potentially replicable inclusion criteria. A number of relevant data sources were searched, but the restriction to published English language articles may mean that articles were missed, and language and publication biases could not be ruled out. Sufficient attempts were made to minimise errors and bias throughout the review process.

Results of the methodological quality assessment were fully reported. The chosen methods of synthesis appeared to be appropriate in light of clinical heterogeneity (statistical heterogeneity was not reported), although the extent to which the statistical synthesis of only two trials is reliable is unclear. The absence of numerically-reported pooled results limited a meaningful interpretation of the synthesis.

The authors’ conclusions reflected the limited evidence presented, and their recommendation for cautious interpretation seems justified.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that high quality trials are needed to evaluate the effectiveness of corticosteroid injections in combination with physiotherapeutic interventions.

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**Bibliographic details**

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Record Status
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.