A systematic review of conservative treatment of carpal tunnel syndrome


CRD summary
The authors concluded that there is strong evidence that local and oral steroids are effective, moderate evidence that vitamin B6 is ineffective and splints are effective, and limited or conflicting evidence about the other treatments. Much of the review was well-conducted, but the comparators were diverse, there was a lack of clarity about grading the evidence, and the conclusions appear overoptimistic given the limited data.

Authors' objectives
To evaluate the effectiveness of conservative treatments for carpal tunnel syndrome (CTS).

Searching
MEDLINE (1985 to May 2006) and the Cochrane Controlled Trials Register were searched for studies published in English. The search terms used for MEDLINE were reported.

Study selection
Randomised controlled trials (RCTs) that assessed the efficacy of conservative treatments for patients with clinically and electrophysiologically confirmed CTS who had not undergone previous surgical release were eligible for inclusion.

The review assessed local injections (steroids with and without local anaesthetic and botulinum toxin B), oral treatments (vitamin B6, steroids, non-steroidal anti-inflammatory drugs, diuretics), physical treatments (low-power laser, transcutaneous electrical nerve stimulation and ultrasound), therapeutic exercises (yoga, tendon nerve gliding exercises, chiropractic therapy, neurodynamic and carpal tunnel mobilisation) and splints (angled at 0° and 20°, daytime and full time wear). The included studies compared these treatments (or combinations of treatments) with sham treatments, placebo, and each other. The review grouped reported outcome measures into clinical, neurophysiological and patient-related outcomes. Most of the studies included a high percentage of patients with bilateral CTS.

Two reviewers independently selected the studies and resolved any disagreements through consensus.

Assessment of study quality
The studies were assessed using the internal validity and descriptive and statistical criteria described by the Cochrane Back Review Group for musculoskeletal disorders (see Other Publications of Related Interest no.1). Studies scoring at least 6 out of 11 points for internal validity were classified as high quality.

Two reviewers independently assessed the studies, and any disagreements were resolved and consensus reached.

Data extraction
For each study, the number of hands, standard deviations and statistical significance of the results were extracted.

Two reviewers independently extracted the data onto a standardised form.

Methods of synthesis
The authors stated that most of the studies were too clinically heterogeneous and did not present sufficient data to be combined statistically. The studies were grouped by intervention and control and combined in narrative. The level of evidence for each intervention was graded as strong, moderate, or limited or conflicting, using a hierarchy of evidence (see Other Publications of Related Interest no.2).

Results of the review
Thirty-three RCTs were included.
Local injections (9 RCTS, 468 patients): 7 studies were high quality. There was strong evidence that local steroid injections are effective: 3 studies reported a significant short-term improvement in symptoms compared with placebo, and 5 studies reported significant improvement from baseline. There was limited evidence that botulinum toxin B injection is ineffective (1 study reported no significant difference between botulinum toxin and placebo).

Oral treatments (6 RCTs, 265 patients): 4 studies were high quality. There was strong evidence that oral steroids are effective but can have side-effects: 3 studies reported significant improvements with oral steroids compared with placebo. There was limited evidence about non-steroidal anti-inflammatory drugs and diuretics (1 RCT compared these, oral steroids and placebo) and moderate evidence that vitamin B6 was ineffective (2 studies reported no difference between vitamin B6 and placebo).

Physical treatments (6 RCTs, 169 patients): 3 studies were high quality. There was conflicting evidence about the efficacy of laser treatment (2 studies reported different results) and ultrasound treatment (2 studies reported different results). Other studies compared combinations of treatments or compared laser with ultrasound.

**Authors’ conclusions**

There is strong evidence about the effectiveness of local and oral steroids; moderate evidence that vitamin B6 is ineffective and splints are effective; and limited or conflicting evidence that non-steroidal anti-inflammatory drugs, diuretics, yoga, laser and ultrasound are effective, and that exercise therapy and botulinum toxin B injection are ineffective.

**CRD commentary**

The review question was defined in terms of the study design, participants and intervention. Inclusion criteria for the outcomes were broad, giving rise to the potential for selective reporting of positive results in the review. Limiting the search to English language publications listed in two databases raises the possibility of publication and language bias, and might have resulted in the omission of other relevant studies. The authors acknowledged these limitations. Appropriate methods were used to minimise reviewer error and bias during the review process. Only RCTs were included and validity was assessed, although only the composite score was presented, making it difficult to independently comment on the reliability of the evidence presented. A narrative synthesis was appropriate given the differences between the studies, and study quality was reported as being taken into account when summarising the level of evidence for each intervention. However, there was insufficient information to confirm the reported levels of evidence. The diversity of the control treatments made it difficult to interpret the evidence. Much of the review was well-conducted, but the lack of transparency in grading the levels of evidence and the diversity of the comparators mean it is not possible to assess the reliability of the authors’ conclusions. In addition, the conclusions that there was strong evidence supporting some interventions appears overoptimistic given the limited data.

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

The authors did not state any implications for practice or further research.

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**Other publications of related interest**

1. van Tulder MW, Assendelft WJ, Koes BW, Bouter LM. Method guidelines for systematic reviews in the Cochrane


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Subject indexing assigned by NLM

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