A systematic review of the effectiveness of manipulative therapy in treating lateral epicondylalgia
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CRD summary
The review concluded that current evidence supported treating lateral epicondylalgia with Mulligan's mobilization with movement, which provided not only immediate benefits, but also improved outcomes at short-term and long-term follow-up. The authors' conclusions should be interpreted with caution in light of the review's methodological limitations.

Authors' objectives
To assess the effectiveness of manipulative therapy in treating patients with lateral epicondylalgia (tennis elbow).

Searching
MEDLINE, CINAHL, HealthSource, SPORTDiscus, and the Physiotherapy Evidence Database were searched to November 2007 for studies published in English. Search terms were reported.

Study selection
Experimental comparative studies of manipulative treatment on any body area in patients with lateral epicondylalgia were eligible for inclusion. Eligible studies were required to report at least one patient-centred outcome (pain, strength, range of motion, work status, or functional questionnaire). Studies examining friction massage alone were excluded; studies of Cyriax physiotherapy were only included if friction massage was followed by the application of Mill's manipulation. Studies of mixed interventions, with modes not normally delivered by a physical therapist (e.g. injections or anaesthetics), were also excluded.

The mean age of participants in included studies ranged from around 38 to 49 years, and mean symptom duration ranged from around 11 weeks to nine months, where stated. The main interventions studied were mobilization with movement (as described by Mulligan) directed at the elbow, mobilisation directed at the cervical spine, and Cyriax physiotherapy. Duration of treatment ranged from three days to eight weeks, where stated. Placebo, and friction massage with ultrasound and exercise, were commonly used comparators. Seventeen different measures were used to assess outcomes, with pain-free grip strength being the most frequently reported.

One reviewer selected studies for inclusion.

Assessment of study quality
One reviewer assessed study quality using a slightly modified PEDro scale. PEDro assessed randomisation, allocation concealment, blinding, baseline comparability, withdrawal and drop-outs, and analysis variables. The PEDro scale was scored out of 10, but as it was considered very difficult to blind therapists and participants, the maximum achievable score was deemed to be 8 out of 10. A score of 6 was regarded as high quality, 4 to 5 as fair quality, and 3 or less as low quality.

Data extraction
The authors did not state how data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
A narrative synthesis was performed, grouped by type of intervention, with differences between studies discussed.

Results of the review
Thirteen studies were included in the review (n=639 participants), with sample sizes ranging from 10 to 198 participants; it appeared that 11 were randomised controlled trials and two were non-randomised controlled trials. PEDro scores ranged from 1 to 8, with a mean of 5.2. Six studies (46%) used blinded outcome assessors, and two
studies used intention-to-treat analysis. Duration of follow-up ranged from immediately following treatment to one year.

Of the four studies of mobilization with movement directed at the elbow (mean PEDro score 6.25), two demonstrated significant increases in pain-free grip immediately after treatment, when compared to placebo or control conditions; one found pain benefits compared to ultrasound and exercise (and compared to no treatment) at three months or less; and one found benefit over wait-and-see, but not corticosteroid injection, at six weeks (although long-term follow-up did suggest benefit compared to corticosteroid injection).

Two of the three studies of mobilisation directed at the cervical spine were of poor and fair quality. They reported significant improvements in pain-free grip strength, pressure pain threshold and upper limb tension test (2b) immediately following treatment, compared with placebo or control. One high quality study of cervical spine mobilisation (including the addition of manual therapy and exercise targeted at the elbow and wrist) found similar effects at six weeks and six months follow-up.

Of the three studies of Cyriax physiotherapy, one poor quality study reported benefit compared to conventional treatment, but the other studies (one high quality and one low quality) favoured use of corticosteroid injections and supervised exercise.

Further results were reported.

**Authors' conclusions**

Current evidence supported Mulligan's mobilization with movement, which provided not only immediate benefits, but also improved outcomes at short-term and long-term follow-up.

**CRD commentary**

The review addressed a clear question and was supported by appropriate inclusion criteria. Although several databases were searched, the restriction to including only published studies in English meant the review may have been prone to both publication and language bias. Only one reviewer assessed study quality and selected studies for inclusion, with details not being reported for data extraction, so reviewer error and bias may have affected the results.

Although the authors carried out a thorough quality assessment, their assertion that the included studies were of fair and acceptable quality is questionable, as it appeared that most studies could have been subject to bias, and most also had small sample sizes (nine of the 13 studies had fewer than 40 participants). An appropriate narrative synthesis was conducted and clinical heterogeneity was discussed, but the lack of reporting of individual result details (including level of statistical significance) made interpretation difficult.

The authors' conclusions should be interpreted with caution in light of the review's methodological limitations.

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

**Practice:** The authors stated that current evidence supports Mulligan's mobilization with movement in providing not only immediate benefits, but also improving outcomes at short-term and long-term follow-up

**Research:** The authors stated that studies are warranted that use larger sample sizes, valid functional outcome questionnaires, short- and long-term follow-up, and inclusion of comparison treatments that are currently used in clinical practice. They also stated that there was a need for more research into cervical spine mobilisation.

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Not stated.

**Bibliographic details**

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.