Acupuncture and dry needling in the management of myofascial trigger point pain: a systematic review and meta-analysis of randomised controlled trials

Tough E A, White A R, Cummings T M, Richards S H, Campbell J L

CRD summary
This review concluded that there was limited evidence that myofascial trigger point needling had an effect on pain compared to usual care and that there was a direction of effect compatible with superiority over placebo. The conclusions, although optimistically phrased, reflect the results and are likely to be reliable with a more cautious reading.

Authors' objectives
To assess the effectiveness of direct dry needling of clinically identified myofascial trigger points, without other potentially active treatment, for pain reduction in patients with a diagnosis of myofascial trigger point pain.

Searching
The following databases were searched, without language restrictions, for dates ranging from 1929 onwards to April 2007: MEDLINE, EMBASE, AMED, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Science Citation Index Expanded and PEDro. Search terms were reported. References of identified papers, a number of journals including Acupuncture in Medicine, publications held by the Chartered Society of Physiotherapy, and the authors’ files were also handsearched.

Study selection
Randomised controlled trials (RCTs) which assessed the direct insertion of a dry needle into clinically identified myofascial trigger points after locating the patient’s area of tenderness were eligible for inclusion. Studies which inserted needles superficially over the site of a myofascial trigger point, into traditional acupuncture points, or into pre-specified myofascial trigger point locations, were excluded from the review. Studies with control interventions which were active treatments were also excluded. Data on pain outcomes reported using a visual analogue scale (VAS) were considered the primary outcome, while pressure pain threshold algometry readings were a secondary outcome.

Included trials assessed myofascial trigger point needling for a range of conditions (including neck and arm pain, post-stroke shoulder pain, hamstring pain, upper trapezius pain and low back pain), with a range of durations. Control treatments used were sham interventions (placebo), superficial needling and usual care. Where reported, patient ages ranged from 18 to 91 and the proportion of males was between 27 and 37%, except where studies recruited either only males or only females. Exclusion criteria varied between trials.

Two or more reviewers independently selected the studies for inclusion in the review at each stage of the selection process.

Assessment of study quality
The trials were assessed for validity using a modified version of the Jadad scale, with a maximum of four points awarded based on the following criteria: randomisation, allocation concealment, blinding, and withdrawals and dropouts. This last criterion was considered to be met only if withdrawals and dropouts did not exceed 30% for long term, or 20% for short term outcomes, and if there was no evidence of differential loss to follow-up.

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Data on pain outcomes were extracted, including changes in mean scores and their standard deviations, where available. Data presented in graphs were extracted by measurement. Outcomes assessed between one and six months after the final treatment were classified as long-term, with those assessed between 24 hours and 30 days after treatment.
considered to be short-term. For crossover studies, only data from the first phase were analysed, unless the data were considered to show no carryover effects.

Two reviewers independently performed the data extraction using a piloted spreadsheet. Discrepancies were resolved through discussion or by adjudication from a third reviewer.

**Methods of synthesis**
The studies were combined using a DerSimonian and Laird random-effects model to calculate weighted mean differences (WMD) with 95% confidence intervals (CI) where clinical homogeneity was considered sufficient. Statistical heterogeneity was assessed using the $I^2$ and $X^2$ statistics.

**Results of the review**
Seven RCTs (n=564 participants) were included in the review. One trial scored 4 points on the modified Jadad scale, two trials scored 3 points, one trial scored 2 points, while three trials failed to score any points. Sample sizes ranged from 20 to 296.

**Myofascial trigger point needling versus sham intervention** (four RCTs): There was no statistically significant difference between the groups in the impact on pain (WMD 14.09, 95% CI: -5.81, 33.99), although a high level of statistical heterogeneity was detected ($I^2=88\%$, $X^2=24.84$).

**Myofascial trigger point needling versus usual care** (one RCT): There was a statistically significant short-term reduction in post stroke shoulder pain in patients treated with patients myofascial trigger point needling in addition to usual care, compared to usual care alone ($p < 0.001$) when measured at three weeks after the end of treatment. Difference in outcome measurement timings limited the value of this result.

**Myofascial trigger point needling versus local needling** (two RCTs): One trial did not report results of statistical comparisons, while the second found no statistically significant difference between the groups.

**Authors' conclusions**
There was limited evidence from one trial that deep needling directly into myofascial trigger points had an overall treatment effect compared to usual care. The non-significant comparison of myofascial trigger point needling versus placebo showed a direction of effect which could be compatible with an impact of the treatment on myofascial trigger point pain. The limited size and quality of these trials supports the need for large scale high quality placebo-controlled trials of the intervention.

**CRD commentary**
The review question and the inclusion criteria were clear and specific. The authors searched a number of relevant databases and other sources. This, together with the lack of language restrictions, reduced the chances that some relevant studies were not included or that language or publication bias was introduced. The authors reported using methods designed to reduce reviewer bias and error in the selection of studies for the review and in the extraction of data, but not in the assessment of validity. Although the validity assessment was conducted using a relatively basic tool, considering the very small sample sizes of the trials, it was used to inform the synthesis. The limited use of meta-analysis was appropriately based on assessment of clinical homogeneity between trials. Statistical heterogeneity was appropriately assessed, but not further explored. The authors’ conclusions reflect the results of the review, but their phrasing may be considered overly optimistic; with more caution, they are likely to be reliable.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that there is a need for large scale high quality placebo-controlled trials of direct dry needling of clinically identified myofascial trigger points for the treatment of patients with a diagnosis of myofascial trigger point pain.
Funding
National Institute for Health Research

Bibliographic details

PubMedID
18395479

DOI
10.1016/j.ejpain.2008.02.006

Original Paper URL
http://www.europeanjournalpain.com/article/S1090-3801(08)00055-4/abstract

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Acupuncture Therapy; Data Interpretation, Statistical; Humans; Myofascial Pain Syndromes /therapy; Needles; Pain Measurement; Randomized Controlled Trials as Topic /standards; Reproducibility of Results

AccessionNumber
12009102624

Date bibliographic record published
29/04/2009

Date abstract record published
14/10/2009

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.