Trigger point injections for chronic non-malignant musculoskeletal pain: a systematic review
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CRD summary
This review concluded that trigger point injections to treat patients with chronic non-malignant musculoskeletal pain were relatively safe, but there was no clear evidence of either benefit or ineffectiveness of this approach. Despite some methodological limitations, the review conclusions broadly followed from the presented evidence and the detailed recommendations for future research seemed appropriate.

Authors' objectives
To assess the published evidence on the efficacy and safety of trigger point injections to treat patients with chronic non-malignant musculoskeletal pain.

Searching
PubMed, EMBASE, CINAHL, The Cochrane Library, Science Citation Index, AMED and BIOSIS Previews databases were searched for relevant evidence to July 2006. Health technology assessment agency websites, research registers, guideline clearinghouses and article bibliographies were searched. Additional grey literature was identified by internet searching. There were no language restrictions. No search terms were reported.

Study selection
Systematic reviews or randomised controlled trials (RCTs) that evaluated use of trigger point injections in patients with chronic non-malignant pain of musculoskeletal origin that had persisted for at least three months were eligible for inclusion. Studies of systemic disease that separately reported subgroup data on patients with chronic musculoskeletal pain were included. Comparisons against any medical, mechanical or surgical intervention, placebo or no treatment were eligible for inclusion. Studies had to report at least one post-treatment efficacy or safety outcome.

Fluids used for trigger point injections in the evaluated studies included saline, sterile water, botulinum toxine A, lidocaine, bupivicaine, procaine, prilcaine and tropisetron. Included trials compared different trigger point injections fluids or the addition of trigger point injections to placebo, physical therapy, stretching exercises, sphenopalatine ganglion block (SPGB), simulated dry needling and intra-articular injection with sodium hyaluronate. Duration of pain ranged from at least three months to a mean of 9.3 years. Length of follow-up ranged from 24 hours to eight months.

One reviewer selected studies for inclusion in the review.

Assessment of study quality
Internal and external validity of included RCTs was assessed according to a Cochrane checklist with 17 criteria for patient selection, interventions, outcome measurement and statistics. Validity was rated as good (≥7 internal validity criteria, ≥5 external validity criteria), moderate (four to six internal validity criteria, three to four external validity criteria) or poor (<4 internal validity criteria, <3 external validity criteria).

Two reviewers independently assessed validity. Disagreements were resolved by discussion and reference to a third reviewer where necessary.

Data extraction
Where possible data were extracted as relative risks (RRs) or risk differences (RDs) for dichotomous outcomes and as mean differences or standardised mean differences (SMDs) for continuous outcomes; 95% confidence intervals (CIs) were calculated where possible. Per-protocol data were extracted.

One review extracted data into a standardised form.

Methods of synthesis
Studies were combined in a narrative synthesis grouped by type of pain.

**Results of the review**

Fifteen RCTs were included in the review. Four trials had good external validity and 11 trials had moderate external validity. For internal validity, two trials were rated good, 11 were rated moderate and two were rated poor. No relevant systematic reviews were identified.

**Head, neck, shoulder and back pain** (10 RCTs, 439 patients): Five RCTs evaluated trigger point injections with local anaesthetic. One RCT showed lidocaine trigger point injection was more effective in relieving myofascial pain up to one week than either SPGB or placebo SPGB. A second RCT found similar reductions in pain scores for prilocaine trigger point injections and tropisetron trigger point injections after seven days, but greater pain relief in the tropisetron group at eight weeks. A third RCT found adding lidocaine trigger point injections to neck stretching improved pain symptoms more than adding ultrasound at two weeks and three months. A fourth RCT found no detectable difference at six months between adding prilocaine trigger point injections or laser treatment to stretching exercises. A fifth RCT reported significant benefits of lidocaine trigger point injections over dry needling in terms of pain, fatigue and work disability four weeks after treatment.

Six RCTs evaluated trigger point injections with botulinum toxin. Three RCTs reported saline trigger point injections and botulinum type A trigger point injections to be equally effective in reducing pain and disability at four months and one reported equivocal results. One trial reported no differences between botulinum toxin trigger point injections and bupivicaine trigger point injections. One RCT reported similar findings for botulinum toxin trigger point injections and lidocaine trigger point injections when added to stretching exercises.

**Whiplash syndrome** (two RCTs, 66 patients): One RCT reported a significant improvement in whiplash syndrome symptoms at three months and in pain scores and mobility at eight months for sterile water trigger point injections compared to saline trigger point injections. A second RCT reported no difference between botulinum toxin trigger point injections and saline trigger point injections in terms of pain, function or range of motion at four weeks.

**Craniofacial pain** (one RCT, 30 patients): One RCT reported that procaine trigger point injections combined with simulated dry needling offered little beyond a placebo effect.

**Cervicogenic headache** (one RCT, 33 patients): One RCT reported no differences between the addition of botulinum toxin trigger point injections or saline trigger point injections to physical therapy.

**Knee osteoarthritis** (one RCT, 33 patients): One RCT reported significant benefits in terms of pain and knee function for addition of lidocaine trigger point injections to intra-articular injection in selected older patients.

Very few adverse events were reported among the included RCTs of trigger point injections.

**Authors' conclusions**

Trigger point injection was a relatively safe procedure, but there was no clear evidence of either benefit or ineffectiveness of the technique for chronic non-malignant musculoskeletal pain.

**CRD commentary**

The review question was reasonably well defined in terms of participants, interventions, outcomes and study designs of interest. A range of sources were searched to identify published and unpublished studies written in any language. Given the diverse nature of the included studies, use of a narrative synthesis and detailed discussion of study validity appeared appropriate. Attempts were made to minimise potential for bias in validity assessment; it did not appear that this was the case for study selection and data extraction.

Despite some methodological limitations in the review, the authors' main conclusions broadly followed from the presented evidence and their detailed recommendations for research appeared appropriate.

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

**Practice:** The authors stated that trigger point injections should not be used as a sole treatment for non-malignant musculoskeletal pain. A minimum of remedial stretching or exercise therapy should be conducted during follow-up.
Research: The authors stated that the effectiveness of trigger point injections must be established before comparing variations in technique, such as different injectants and needling technique. They provided detailed recommendations for the conduct of future studies in this area.

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