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Systematic review

Effects of dry needling trigger point therapy in the shoulder region on patients with upper extremity pain and dysfunction: a systematic review with meta-analysis

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Abstract

Question What is the effectiveness and what are the adverse effects.
Design Systematic review with meta-analysis.
Participants Patients with shoulder or upper extremity pain or dysfunction.
Intervention Trigger point dry needling (TDN) compared to control, another intervention or another needling technique.
Outcome measures Primary outcome measures included shoulder or upper limb pain, shoulder or upper limb dysfunction.
Results Eleven randomized trials involving 496 participants were appraised. There was very low evidence that trigger point dry needling of the shoulder region is effective for reducing pain and improving function in the short term. There is some evidence that needling both active and latent trigger points is more effective than needling an active trigger point alone for pain immediately and 1-week after treatment (SMD = −0.74, 95%CI = −1.2 to −0.3; and SMD = −1.0, 95%CI = −1.52 to −0.59).
Conclusion There is very low evidence to support the use of TDN in the shoulder region for treating patients with upper extremity pain or dysfunction. Two studies reported adverse effects to TDN interventions. Most common adverse effects included bruising, bleeding, and pain during or after treatment. Future studies are likely to change the estimates of the effectiveness of TDN for patients with upper extremity pain or dysfunction.

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Keywords: Trigger point; Dry needling; Myofascial pain; Shoulder; Acupuncture

Introduction

Upper extremity pain and disorders are a major worldwide problem and are a huge economic burden, with high healthcare costs and time off work [1]. Shoulder pain is the third most common musculoskeletal reason for primary care consultations in the United Kingdom [2]. The cumulative annual incidence of shoulder pain ranges from 1 to 3% of general practice consultations [3–5], while the 12 month prevalence of upper extremity disorders may reach 41% [1].

Myofascial trigger points (MTPs) are frequently found in the shoulder muscles of patients with upper extremity complaints [6] and can restrict movement, alter muscle timing and cause pain [7]. There are two types of MTPs: latent and active, and both are tender taut bands within muscles that under mechanical stimulation produce local or referred pain, hyperalgesia, allodynia, motor [8] or autonomic changes [9]. Latent MTPs produce pain only on mechanical stimulation, such as direct pressure or needling. Active spontaneously MTPs cause symptoms at rest or during activity [7]. MTPs can be the result of sustained posture or may develop as a result of neuromuscular disorder or injury, and can lead to muscle weakness and inhibition.

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Trigger point dry needling (TDN) is a form of acupuncture where rapid in and out needling is used directly into the MTP to relieve the local tension and reduce pain from the MTP. The mechanisms of pain reduction following TDN are not completely understood, however recent research suggests that there is both a central and local effect [10]. Trigger point dry needling is effective at relieving pain in the short-term for lower back and leg symptoms [11] and there are mixed results for other areas of the body [12–16].

Previous systematic reviews have assessed the effect of dry needling on the upper quadrant (with cervical spine and shoulder region combined) [12,15,16]. Combining cervical with shoulder disorders may bias findings regarding the effect of this technique on the shoulder alone. The cervical spine is a complex segment of the body, with potentially several structures contributing to local and referred symptoms. The shoulder complex is very reliant on muscular timing, control and synergy. Therefore, for this systematic review, the TDN was restricted to the shoulder region alone, and was conducted to answer the following research questions: (1) What is the effectiveness of TDN of the shoulder region for the management of upper extremity pain or dysfunction? (2) Are there any adverse effects when TDN of the shoulder region is used for the management of upper extremity pain or dysfunction?

Method

Identification and selection of studies

We followed the Preferred Reporting Item for Systematic Reviews and Meta-Analyses (PRISMA) recommendations [17]. The protocol was prospectively registered at the International Prospective Register of Systematic Reviews (PROSPERO) (registration number: CRD42016045639).

A systematic electronic search was undertaken in the following databases: Medline, Embase, Allied Complementary Medicine Database (AMED), Cochrane Central Register of Controlled Trials, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus and PEDro from their inception until the end August 2016. The search strategy was developed with the assistance of a University of Otago Health Sciences Librarian. The search strategy used in Medline is described in the online Supplementary Material; this was adapted slightly for use in the other databases. We screened reference lists of articles identified through the electronic search (forward searching). Date last searched was 31st August 2016. Studies in languages other than English were excluded.

Randomised controlled trials were included if they tested the effects of TDN of at least one MTP in the shoulder region on shoulder or upper extremity pain or dysfunction. Observational studies such as cohort and case-control studies were included if they assessed the adverse effects or harm linked to the TDN in patients with upper extremity pain or dysfunction. Studies were excluded if the intervention combined TDN group with other forms of acupuncture such as needling of non-trigger points, superficial needling, or injection treatments.

Titles and abstracts found through the electronic search were independently screened by two reviewers (MLH and ACM). Full text articles were then independently assessed for eligibility by the same two reviewers. Any disagreements between the two reviewers were resolved by discussion followed by consensus. If consensus was not achieved, a third reviewer (DCR) was consulted.

Participants

We included studies with patients presenting with shoulder or upper extremity pain or dysfunction of any cause or pathology.

Interventions

Studies that compared TDN to a control or another intervention. Examples included placebo or sham needling, no intervention (such as waiting list control), other interventions (e.g. other types of acupuncture, wet needling surgery, medication, exercises) or any type of manual therapy (e.g. soft tissue sustained pressure, soft tissue mobilization, joint mobilizations or manipulations, shoulder retraining).

Outcome measures

Primary outcomes of shoulder or upper limb pain, and shoulder or upper limb dysfunction, including range of movement and strength, were evaluated. Other outcome measures such as pain pressure thresholds of local or remote sites, self-rated recovery and any other valid outcomes were included as secondary outcomes. Any adverse effects were evaluated for frequency and severity.

Risk of bias within included studies and Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA)

Two reviewers independently assessed the risk of bias within included studies and the quality of reporting. The PEDro checklist was used to assess risk of bias within included studies. Studies with PEDro scores greater than or equal to six were considered as having low risk of bias. The STRICTA checklist was used to analyse quality of the reporting of the interventions used [18].

Data extraction and analysis

Data were independently extracted by two reviewers (MLH and ACM). In the case of disagreement, a third reviewer was consulted (DCR). Extracted data included:

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