ULTRASOUND-GUIDED INTERVENTIONAL PROCEDURES FOR MYOFASCIAL TRIGGER POINTS: A SYSTEMATIC REVIEW

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BACKGROUND

- Myofascial pain syndrome (MPS) is a highly prevalent musculoskeletal pain syndrome characterized by hard, palpable, discrete, and localized nodules known as myofascial trigger points (MTrPs).
- Diagnostic ultrasound (US) has been proposed as a method to strengthen the reliability of MTrP localization, thus potentially improving the efficacy and safety profile of interventional procedures.

OBJECTIVE

To evaluate the benefit and safety profile of any US-guided interventional procedure for MPS.

METHODS

PROSPERO Registration #: CRD42020184891

Data Sources

- MEDLINE, EMBASE, PubMed, AMED, and Web of Science were searched from their inception to May 2020 for any peer-reviewed randomized-controlled trial (RCT)

Study Selection

- **Participants:** with MPS and of any age, sex, and gender
- **Intervention:** Any US-guided interventional procedure (e.g. trigger point injections, dry needling, etc.) into MTrPs, with no restrictions on US modality
- **Controls:** blinded interventional procedures, other US-guided interventional procedures, and non-interventional therapies
- **Outcomes:** pain severity, function, and adverse events
- **Exclusion criteria:** non RCTs, patients with systemic comorbidities, no US-guidance

Methodological Assessment

- Study quality was assessed using the Cochrane Risk of Bias 2.0 tool

Data synthesis and analysis

- We deemed a meta-analysis inappropriate due to substantial clinical heterogeneity of included studies.
- Outcomes were stratified into the following categories: US-guided interventional procedures versus: 1) blinded interventional procedures, 2) other US-guided interventional procedures, 3) non-interventional therapies

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta- Analyses diagram.

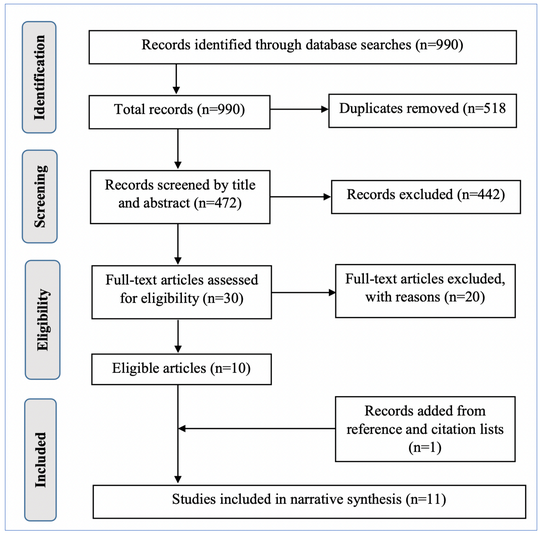
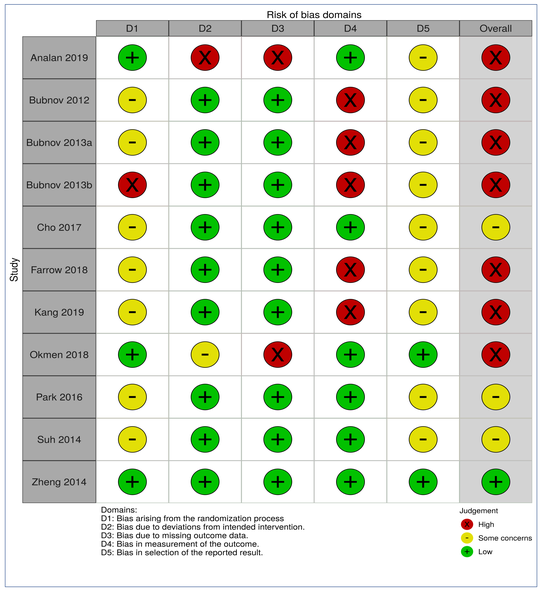


Figure 2. Overall Risk of Bias Assessments



RESULTS

Characteristics of Included Studies

- Eleven single-centre parallel-group RCTs with two arms were included
- Interventions included: US-guided local anesthetic injections, US-guided dry needling (DN), US-guided pulsed radiofrequency (PRF), US-guided platelet-rich plasma (PRP) injections, US-guided miniscalpel release, US-guided saline injections, blinded local anesthetic injections, blinded DN, and oral naproxen.

US-Guided Versus Blinded Interventional Procedures

- Two studies (n=174) with high risk of bias revealed some evidence supporting US-guidance over blinded interventions for improvement in pain and function, although no adverse effect data was available

Table 1. Summary of Findings for US-Guided Versus Blinded Interventional Procedures

Study	Intervention	Comparison	Efficacy
Bubnov et al. (2013)	US-guided dry needling	Blinded dry needling	Statistically significant within-group improvement in Visual Analogue Scale (VAS) pain score in intervention (7.2±3.8 to 1.1±0.48, (P<0.001)) and comparison groups (7.4±1.94 to 2.7±1.30 (P<0.001))
Kang et al. (2019)	US-guided local anesthetic injection	Blinded local anesthetic injection	Statistically significant between-group improvement in VAS pain scores (-1.92±0.56 vs -1.20±0.85; P=0.003), Shoulder Pain and Disability Index (+20.14±8.90 vs +9.70±16.39; P=0.018), and Neck Disability Index (+11.14±4.19 vs +5.85±7.80; P=0.012) favoring intervention

US-Guided Interventional Procedures Versus Other US-Guided Interventional Procedures

- Eight studies (n=483) with varying risks of bias were head-to-head comparisons of various US modalities
- Studies revealed that US-guided local anesthetic injections were not statistically different from US-guided saline injections, but were statistically inferior to US-guided PRF and US-guided DN. US-guided DN was also found to be superior to US-guided PRP injections but inferior to US-guided miniscalpel
- All procedures resulted in zero or minimal self-limited adverse events

US-Guided Interventional Procedures Versus Non-Interventional Therapies

- One study (n=21) with some concerns of bias revealed a statistically significant between-group difference in VAS pain scores in favor of US-guided local anesthetic injections over oral naproxen.
- The US-guided group experienced no adverse events compared to 20% (n=2) of control patients

CONCLUSION

- There is some evidence to suggest that pain and functional outcomes are improved with the addition of US-guidance, although the value of US-guided interventions remains unclear for treatment of MPS due to limitations in study quality and sample size
- Considering that MPS remains a clinical diagnosis, we recommend US-guidance as an adjunct to palpation of MTrPs, and not as a stand-alone diagnostic tool

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