The Effectiveness of Dry Needling for Temporomandibular Disorders: A Systematic Review

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Background

Temporomandibular joint disorder (TMD) is characterized by jaw pain, stiffness, clicking, grating, or limited mouth opening. Dry needling, the therapeutic use of acupuncture needles inserted into myofascial trigger points, is currently being used as a treatment for TMD. Dry needling is different from acupuncture in that needles are inserted directly into trigger points instead of into traditional acupuncture points.

Objectives

We conducted a systematic review with intent to perform meta-analyses to evaluate the effectiveness and safety of dry needling as a treatment for TMD in the context of physical therapy practice.

Methods

- We conducted a systematic review of the published literature using the following databases: MEDLINE, EMBASE, CINAHL, Google Scholar, and Web of Science for all publication dates from inception to January 2014.
- Study inclusion criteria:
  - Patient population was those with TMD
  - Dry needling used as an intervention
  - Pain as reported measure
  - Published in English language
- Exclusion criteria: Use of acupuncture (as opposed to dry needling)
- We assessed the quality of primary studies using the following assessment criteria: Good (minimal bias); Fair (study susceptible to some bias); or Poor (significant bias that may invalidate findings).

Results

- The search yielded 33 unique articles, of which 4 met our inclusion criteria.
- Each of the 4 studies demonstrated a significant decrease in pain as well as improved ROM associated with both dry needling and sham needling.
- Findings from each of the 4 included studies are summarized in the Table.
- Due to the heterogeneity between the studies, a pooled estimate of effectiveness could not be calculated.

Summary of Articles

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>N</th>
<th>Study Design</th>
<th>Outcomes</th>
<th>Interventions</th>
<th>Results</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diragioiu, 2012</td>
<td>RCT</td>
<td>52</td>
<td></td>
<td>Pain pressure threshold</td>
<td>Active: 3 weekly treatments of dry needling to TrP in masseter and temporomuscular muscles; Control: 3 weekly treatments of sham needling to non-steroid areas in masseter and temporomuscular muscles</td>
<td>Dry needling group had significantly better improvements in pain pressure threshold. No significant difference between groups for pain or jaw opening.</td>
<td>Good</td>
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<td>Fernandez-Camero, 2010</td>
<td>Crossover RCT</td>
<td>12</td>
<td></td>
<td>Pain pressure threshold</td>
<td>Active: Dry needling into TrP in masseter muscle; 3 local twitch responses elicited; Control: Sham procedure above TrP; no twitch response elicited</td>
<td>Between groups pre and post treatment differences all statistically significant (p&lt;0.001)</td>
<td>Fair</td>
</tr>
<tr>
<td>McMillan, 1997</td>
<td>RCT</td>
<td>30</td>
<td></td>
<td>Masseter Pain Pressure Threshold</td>
<td>Active: Proximal (1%) injection to masseter TrP; sham Group B: Dry needling to TrP in masseter; sham saline injection; sham needling</td>
<td>Significant decrease in pain unpleasentance and intensity across all 3 groups. No differences for any groups with any treatment.</td>
<td>Good</td>
</tr>
<tr>
<td>Gonzales-Perez, 2012</td>
<td>Cohort</td>
<td>36</td>
<td></td>
<td>Pain, Mouth Opening, Laterality of Mandibular Movement, Mandibular Protrusion</td>
<td>3 weekly treatments of dry needling to trigger points in external pterygoid muscle and masseter muscle</td>
<td>At 6 month follow-up, statistically significant decrease in pain. No other post-treatment values significantly different</td>
<td>Fair</td>
</tr>
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</table>

Discussion Points

- This is the first systematic review on the topic.
- Limitations due to our methods: our search strategy may have missed relevant studies.
- Limitations due to existing evidence: limited number of eligible studies, small sample sizes in each study, and no two studies measured outcomes the same way, thereby precluding meta-analysis.
- Limitations of using sham dry needling: sham dry needling may not be a physiologically inert placebo.
- Each study found that dry needling treatments resulted in improved outcomes over time, but not between study groups.
- Existing evidence suggests that dry needling is associated with improved outcomes over time, but there is insufficient evidence to determine whether these improvements can be attributed to placebo effects, regression to the mean, or natural history of TMD-related symptoms.

Future Research

Future research should include the 10 cm pain visual analog scale (VAS) as an outcome measure, as we feel that this is the most relevant outcome for patient perception of successful treatment. Large-scale, randomized clinical trials with standardization of follow-up periods and treatment protocols will allow pooled statistical comparison of outcomes in a meta-analysis.

References


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