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| **Student: Christopher Ritter****Question: For a patient with Temporomandibular Joint Disorder (TMD) is Therapeutic Dry Needling/Acupuncture Therapy effective in treatment of pain and other symptoms?** | **Date: 12/11/2013 Search: PubMed, Cochrane, PEDro, Google Scholar, CINAHL** |
| **Author/ Year** | **Purpose/Design/ Subjects** | **Intervention or description**  | **Measurements** | **Outcomes** | **Comments****/limitations** |
| Fernandez-Carnero, J., et al. (2010) | To measure the short-term effects of the dry needling of trigger points (TrPs) in the masseter on TMD pain; Randomized, Double-blind Controlled Trial; n=12 Females 20-41 yo diagnosed with TMD. | Each participant had 2 treatment session on 2 separate days and received 1 randomly assigned intervention: deep dry needling (experimental) or sham dry needling (placebo). Pressure Pain Threshold over the masseter muscle TrPs and mandible condyle and pain-free active jaw opening were assessed pre- and 5 minutes post intervention by blinded examiner. | Examiner Blind to treatment allocation:Pressure Pain Threshold (PPT) over (1) masseter muscle TrP and(2) mandibular condyle. (3) Pain-free active jaw opening.2-way repeated-measures ANOVA. | Dry-needling into TrPs was correlated with significant increases in PPT’s and maximal jaw opening when compared to sham dry needling. | Small sample size. Comparing the short-term results immediately after treatment or sham treatment for the same individuals helped to control for potential bias of differences in one treatment group to another. |
| Smith, P., et al., (2007) | To compare acupuncture and sham acupuncture in the treatment of TMJ myofacial pain; double-blind, randomized control trial; n=27 | 27 subjects randomized to 2 groups and pre-tested for baseline levels (see measures to right🡪) 1st group received real acupuncture while 2nd group receive sham (blunt needles) administered using the Park Sham Device (PSD).Measures were retested 3 days and 7 days following final treatment session. | -VAS score (mean and intensity)-Pain distribution-Maximum inter-incisor opening-Extent of lateral movement-Tenderness of masticatory muscles-Presence of headache | Both groups (sham and real) showed improvements in VAS (mean and intensity) but only real acupuncture improvements were stat. sig.Both groups showed improvement for pain distribution but only real acupuncture group’s were stat. sig. No stat. sig. results for other measures.  | The participants were volunteers, thus likely biasing results based on expectation (even the control (sham) group improved on many measures (though not to a stat. sig. degree). The study also failed to mention the number of treatment sessions or take account for the varying baseline levels between participants in each group. |
| Itoh, J., et al. (2011) | To compare trigger point acupuncture to sham treatment to determine effects on pain intensity and oral functioning 10 weeks after the beginning of treatment; Preliminary Randomized Clinical Trial; n=16 volunteers with complaints of TMD pain for > 6 months. | 10 weeks study; 2 treatment groups, one receiving trigger point acupuncture for 5 sessions and the other group receiving equivalent sham treatment. | Measured 5 and 10 weeks after treatment for:(1)Pain intensity using visual analogue scale (VAS) and (2) maximal mouth opening | Both groups had significant pain decrease, but difference between the 2 was significant (p<0.0152). Oral functioning as measured by maximal mouth opening did not change significantly for either group. | The subjects were volunteers from an acupuncture school. The sham treatment group also showed significant improvement (although not as much). The difference in effect between the 2 groups was shown to be significant. Were the participants able know which treatment they were receiving? |
| Noiman, M., et al., (2010)  | To examine the efficacy and safety of acupuncture in relief of pain from TMD; retrospective study comparing pain alleviation from acupuncture between patients suffering from TMD pain and trigeminal neuralgia(TN); n=39. | Patients measured according to improvement of pain by VAS after receiving 8-10 weekly treatments of acupuncture. Groups divided by acute (symptoms<3 months), chronic (>3months), and by TMD vs. TN.  | VAS (0-10), 0=no pain, 10=strongest pain. Measured before starting treatments and at every visit before treatment. | 0 adverse reactionsMajor Pain alleviate (>80%) observed in 82% of patients treated. Partial pain alleviation (30-80%) in remaining 4 patients.More effective for TMD than TN (91% vs. 70% reporting significant improvement).Acute cases needed average of 5.8 treatments to report sig. improvement. Chronic needed avg. 8.1. | The study was not a RCT. (no placebo group) and only included 4 TN patients. While results were statistically significant, sound conclusions cannot be drawn given lack of control. N=39 with 8-10 treatment weeks and 0 adverse reactions with overwhelming improvement on VAS does support safety and efficacy (even if for a counfounding reason). |
| Jung, A., et al. (2011) | To evaluate the best clinical evidence for or against the effectiveness of acupuncture-type treatments compared to relevant sham ones in patients with TMD; A systematic review and meta-analysis of randomized, sham-controlled trials; Studies that met the inclusion criteria were 7 Random Control Trials (RCTs) met inclusion criteria with subjects who were diagnosed with TMD. | The 7 RCT’s which met the inclusion criteria were each reviewed by two independent reviewers. Quality assessment was assessed using the Cochrane risk of bias criteria. The data was pooled across studies using random effect models in cases were studies differed significantly with respect to chi-square test and Higgens I². | While the specific measurements used in each study varied slightly, they collectively measured pain relief in TMJ with use of the visual analogue scale (VAS), verbal scale, or algometer and mouth range of motion (ROM), including inter-incisal mouth opening (MO). | VAS improved in all 7 studies and for all types of TMD and for one time treatments and repeat treatments. For ROM and MO, results were mixed. While several studies showed positive effect, lack of standard deviations prevented pooled analysis. One study showed no statistical difference between sham group. | While the evidence for acupuncture’s beneficial effects was consistently found in some way to varying degrees in all of the studies, the relatively small number of RCT’s which met the criteria and the small samples sizes lacking significant power demonstrate a need for future large scale, highly controlled studies. The review recommended that a minimum of 28 participants for sufficient power. The results also supported the validity of several sham methods although future, controlled studies focusing solely on sham methods are needed. |

**Bibliography**

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**Summary: For a patient with Temporomandibular Joint Disorder (TMD) is Therapeutic Dry Needling/Acupuncture-like Therapy effective in treatment of pain and other symptoms?**

 The evidence evaluated supports the conclusion that Therapeutic Dry Needling (TDN) /Acupucture-like Therapy is effective in treatment of pain for patients with TMD. The evidence fails to conclusively show that Therapeutic Dry Needling/Acupucture-like Therapy is effective for other symptoms of TMD. It should be noted that the evidence which does exist in support of TDN and Acupuncture for effective treatment of pain with TMD, relies upon both clinicians and in many cases patients who are predisposed to believe in its therapeutic benefits before treatment. Execution of a true double-blind treatment procedure is intrinsically difficult due to the fact that the clinician must be aware of what he or she is doing. In terms of the participants themselves, many studies employed volunteers or even acupuncture students which opens the possibility for treatment effects to be the result of expectation bias. While many studies used sham acupuncture as the control group, it would also be interesting to conduct studies using control groups who did not receive acupuncture or who received it in an unconscious state in which they were unaware of the treatment. In this way, placebo improvements could be measured against those who did not believe they were receiving the treatment and those who were receiving it yet were unaware of it. While there is evidence to support the sham methods used in many of the studies, further randomized controlled studies evaluating the validity of this procedure should be evaluated given that the results rely upon the validity of this as a control. Lastly, small sample size was a limiting factor in each of the randomized controlled studies examined. According to the meta-analysis conducted by Jung, A., et al. 2011, a minimum of 28 participants are needed for adequate power.