**Critically Appraised Topic (CAT)**

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| **Project Team:** |
| **10B-1** |
| **Project Team Participants:** |
| **Timothy LeMoine, Emily Kabitzke, Madison Nelson, Isabelle Kick** |
| **Clinical Question:** |
| **What minimally invasive techniques are effective for the treatment of TMD and myofascial pain?** |
| **PICO Format:** |
| **P:** |
| **Patients with temporomandibular myofascial pain** |
| **I:** |
| **Trigger point injections** |
| **C:** |
| **Dry needling** |
| **O:** |
| **Effective treatment modality** |
| **PICO Formatted Question:** |
| **For patients with temporomandibular myofascial pain, are trigger point injections, compared to dry needling, an effective treatment modality?** |
| **Clinical Bottom Line:** |
| **Both dry needling and trigger point injections are effective modalities in the treatment of temporomandibular myofascial pain. Trigger point injections given with 0.5% lidocaine may provide for a more comfortable therapy option. Both treatment modalities can be combined with others to improve treatment efficacy.** |
| **Date(s) of Search:** |
| **October 12, 2020** |
| **Database(s) Used:** |
| **PubMed** |
| **Search Strategy/Keywords:** |
| **Temporomandibular disorder, myofascial pain, orofascial pain, dry needling, trigger point** |
| **MESH terms used:** |
| **Myofascial Pain Syndromes / therapy; Injections, Intramuscular; Temporomandibular Joint / physiopathology; Temporomandibular Joint Dysfunction Syndrome / drug therapy; Acupuncture Therapy / methods; Combined Modality Therapy** |
| **Article(s) Cited:** |
| **Article 1:**  Dıraçoğlu D, Vural M, Karan A, Aksoy C. Effectiveness of dry needling for the treatment of temporomandibular myofascial pain: a double-blind, randomized, placebo controlled study. J Back Musculoskelet Rehabil. 2012;25(4):285-90. doi: 10.3233/BMR-2012-0338. PMID: 23220812.  **Article 2:**  Kamanli A, Kaya A, Ardicoglu O, Ozgocmen S, Zengin FO, Bayik Y. Comparison of lidocaine injection, botulinum toxin injection, and dry needling to trigger points in myofascial pain syndrome. Rheumatol Int. 2005 Oct;25(8):604-11. doi: 10.1007/s00296-004-0485-6. Epub 2004 Sep 15. PMID: 15372199.  **Article 3:**  Ozkan F, Cakır Özkan N, Erkorkmaz U. Trigger point injection therapy in the management of myofascial temporomandibular pain. Agri. 2011 Jul;23(3):119-25. doi: 10.5505/agri.2011.04796. PMID: 21935818. |
| **Study Design(s):** |
| **Randomized Control Trials** |
| **Reason for Article Selection:** |
| **Article 1: Dıraçoğlu**  **This RCT compares dry needling to sham dry needling of a placebo group for the treatment of temporomandibular joint pain in order to understand the effectiveness of dry needling.**  **Article 2: Kamanli**  **Although this RCT doesn’t directly address temporomandibular joint pain, it does compare the efficacy of dry needling versus lidocaine trigger point injections and botulinum toxin trigger point injections for the treatment of myofascial pain in general, along with**  **Article 3: Ozkan**  **This RCT compares the efficacy of treating temporomandibular myofascial pain by stabilization splint alone to stabilization splint combined with trigger point injections.** |
| **Article(s) Synopsis:** |
| **Article 1: Dıraçoğlu**  **Methods- Two groups of 26 were randomly divided into a study group and a placebo group. The study group would receive dry needling treatment while the placebo group would receive sham needling. Sham needling differs from dry needling as it is an inert therapeutic tool and does not stimulate the target nerve, unlike dry needling aims to do. Pain threshold was assessed as a measurement of unassisted jaw opening without pain using pressure algometry and a 10 cm visual analog scale (VAS).**  **Results- Mean algometric values were higher in the study group, but there were no differences between the two groups for VAS or opening without pain.**  **Article 2: Kamanli**  **Methods- Three groups were randomly assigned: lidocaine injection (32 TrP), dry needling (33 TrP), and BTX-A injection (22 TrP). Trigger point injections (TrP) and dry needling was performed on cervical and/or periscapular regions. Evaluation was done based on cervical range of motion, pain pressure threshold (PPT), pain scores (PS), visual analog scales for pain, work disability and fatigue (VAS) at both the beginning and end of the 4 week trial. Quality of life was also assessed using the Nottingham health profile. Injections were given as follows: 1 mm of 0.5% lidocaine administered to each TrP in the lidocaine group, 10-20 IU of BTX-A to each TrP in the BTX-A group, and dry needling to each TrP in the dry needling group. Stretching of the muscle groups was done for each patient after TrP injections.**  **Results- PPT and PS improved in all 3 TrP groups. However, the lidocaine group seemed to show the most efficacy as PPT values for this group were significantly higher than in the dry needling group and PS values were significantly lower than in both the dry needling and BTX-A groups. VAS and quality of life scores only significantly decreased in the lidocaine and BTX-A groups.**  **Article 3: Ozkan**  **Methods- 50 patients diagnosed with temporomandibular myofascial pain were randomly assigned to 2 groups. Group 1 was treated using a stabilization splint alone, while Group 2 was treated using stabilization splint combined with trigger point injections. Visual analog scores (VAS) were used to assess the results of the study at weeks 4 and 12.**  **Results- Improvement in signs and symptoms was noted in both groups, however there was a significant reduction in VAS scores in Group 2 at weeks 4 and 12.** |
| **Levels of Evidence:** (For Therapy/Prevention, Etiology/Harm)  See <http://www.cebm.net/index.aspx?o=1025>  **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)  **1b** – Individual RCT  **2a** – Systematic Review of Cohort Studies  **2b** – Individual Cohort Study  **3** – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research  **4a** – Systematic Review of Case Control Studies  **4b** – Individual Case Control Study  **5** – Case Series, Case Reports  **6** – Expert Opinion without explicit critical appraisal, Narrative Review  **7** – Animal Research  **8** – In Vitro Research |
| **Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews**  See article **J Evid Base Dent Pract 2007;147-150**  **A** – Consistent, good quality patient oriented evidence  **B** – Inconsistent or limited quality patient oriented evidence  **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening |
| **Conclusion(s):** |
| **I am unable to select levels of evidence above so I will add them in this section.**  **Article 1: Dıraçoğlu**  **Level of evidence: 1b – Individual RCT**  **Strength of recommendation: B**  **Conclusion- Dry needling is an effective treatment method in relieving pain at myofascial trigger points.**  **Article 2: Kamanli**  **Level of evidence: 1b – Individual RCT**  **Strength of recommendation: B**  **Conclusion- Lidocaine injection is the most practical method of TrP, as it is causes less disturbance than dry needling and is more cost effective than BTX-A injection.**  **Article 3:**  **Level of evidence: 1b: Individual RCT**  **Strength of recommendation: B**  **Conclusion- Trigger point injection therapy combined with stabilization splint therapy is more efficacious than stabilization splint therapy alone in the treatment of temporomandibular myofascial pain, but further research should be done to confirm its effectiveness over other treatment options.** |