**Critically Appraised Topic (CAT)**

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| **Project Team:**  |
| **7B-2 Viktoriia Senych Team Leader** |
| **Project Team Participants:**  |
| **Tom Gorski, Daniel Stein, Alexandra Pentala** |
| **Clinical Question:** |
| **For patients with TMD, is treatment with trigger point injections using lidocaine superior to using botox and dry needling?** |
| **PICO Format:** |
| **P:** |
| **Management of TMD** |
| **I:** |
| **Treatment using trigger point injections with lidocaine** |
| **C:** |
| **Trigger point injections with botox and dry needling** |
| **O:** |
| **effectiveness** |
| **PICO Formatted Question:** |
| **For patients with TMD, is treatment with trigger point injections using lidocaine superior to using botox and dry needling?** |
| **Clinical Bottom Line:** |
| **Substance injections (lidocaine or botox) is preferred over dry needling. When choosing between lidocaine or botox, one should consider price, patient preference, as well as medical contraindications for either** |
| **Date(s) of Search:**  |
| **11/02/2020** |
| **Database(s) Used:** |
| **PubMed** |
| **Search Strategy/Keywords:** |
| **TMD, TMJ Pain, trigger point, injection, dry needling, botox** |
| **MESH terms used:** |
| **TMD, Trigger point, injection, lidocaine, botox** |
| **Article(s) Cited:** |
| * **Roberta de Abreu Venancio, Francisco Guedes Pereira Alencar & CamilaZamperini (2009) Botulinum Toxin, Lidocaine, and Dry-Needling Injections in Patients withMyofascial Pain and Headaches, CRANIO®, 27:1, 46-53, DOI: 10.1179/crn.2009.008**
* **Bilici IŞ, Emes Y, Aybar B, Yalçın S. Evaluation of the effects of occlusal splint, trigger point injection and arthrocentesis in the treatment of internal derangement patients with myofascial pain disorders. J Craniomaxillofac Surg. 2018 Jun;46(6):916-922. doi: 10.1016/j.jcms.2018.03.018. Epub 2018 Mar 31. PMID: 29692327**
* **Kietrys DM, Palombaro KM, Azzaretto E, Hubler R, Schaller B, Schlussel JM, Tucker M. Effectiveness of dry needling for upper-quarter myofascial pain: a systematic review and meta-analysis. J Orthop Sports Phys Ther. 2013 Sep;43(9):620-34. doi: 10.2519/jospt.2013.4668. PMID: 23756457.**
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| **Study Design(s):** |
| 1. **Patients were divided into 3 groups for treatment of TMD and headaches: Lidocaine at 0.25%, Botox at 0.25% and dry needling. Doctors used digital palpation to locate trigger point, then each patients associated treatment was administered. Injections were given until a “local twitch response” was no longer seen in each case. With follow ups, doctos used a set of criteria to evaluate the effectiveness of botox vs lidocaine (see pg 48 of article).**
2. **“The study was composed of TMD patients and the predictor variables were therapy combinations including stabilization splint (SS) therapy, SS+trigger point injection therapy (TPI) and arthrocentesis. The primary outcome variables were pain and jaw movements. The follow-ups were done at 1st and 3rd months. 56 patients who were treated for TMD with only SS or combined therapies were included in the study. The effects of additional TPIs were compared to SS therapy alone. Also the effect of arthrocentesis was evaluated too.”**
3. **This meta-analysis screened articles for the following criteria: (Dry needling, Performed on human subjects with, MPS)**

**These articles were analyzed and validated using the “MacDermid Quality Checklist) – 246 Articles qualified (12 picked at random)****“Four separate meta-analyses were performed: (1) dry needling compared to sham or control immediately after treatment, (2) dry needling compared to sham or control at 4 weeks, (3) dry needling compared to other treatments immediately after treatment, and (4) dry needling compared to other treatments at 4 weeks.”** |
| **Reason for Article Selection:** |
| 1. I **chose this article because although it is not the highest level of evidence, the article studies the exact comparison we were interested in.**
2. **This article shows how combination therapy is more effective that single treatments alone.**

**It also continues to demonstrate that these treatment options are only temporary fixes to a larger problem that must be addressed.**1. **High level of evidence**

**Meta-analysis****Compared our treatment method to others for both immediate relief and 4 week recall results** |
| **Article(s) Synopsis:** |
| 1. **For the re-eval periods, patients showed no “significant difference of behavior.” The article also noted, “treatments directed only at alleviating or controlling the head pain have shown discouraging results in a chronic population.” This, the article attributes, is from our lack of knowledge in the technique and execution. Based on the article, it is clear that the results seem to be entirely patient based and not very consistent/ predictable. Some patients will respond well to this treatment, however, the article states that in treating the general population, these methods seem impracticle.**

**It is important to note that these tests DID see positive results. However, the duration of such results are not significant enough to “treat/cure” the problem we are addressing. The article says this is because while the treatments can control/ manage the problem, the underlying etiologies causing the initial problem is not being addressed. Therefore, this article concludes that this method, at least with the technique used, is most practicle in emergency situations to relieve pain. Also, lidocaine should be used over botox as they both achieve satisfactory results, yet lidocaine is significantly cheaper.**1. **Results**

**All methods showed positive outcomes****Those in group B (Splint + trigger point injections) showed significantly less pain (smaller VAS) compared to group A (Splint without injections)****Combination therapies were found to be most effective****“They reported that TP injection with SS showed better results than SS therapy alone. TP injection reduced pain more quickly and shortened the treatment time” – Ozaken****Conclusions****“TPI+SS therapy over splint use alone was shown to be a more effective method for decreasing VAS pain scores in TMD patients in this study.”**1. **Results**
	1. **Meta-analysis of Dry needling vs control (immediate results)**
		1. **Dry needling showed drastic reduction in pain compared to control**
	2. **Meta-analysis of Dry needling vs control (4 week recall results)**
		1. **Dry needling was favored (results were less significant than immediate results, close to being considered “no difference”)**
	3. **Meta-analysis of Dry needling vs Lidocaine (immediate results)**
		1. **Lidocaine was favored over dry-needling**
	4. **Meta-analysis of Dry needling vs Lidocaine (4 week recall results)**
		1. **Lidocaine was favored over dry-needling “effect size was of questionable clinical meaningfulness”**

**Conclusion: “Findings of studies that compared dry needling to other treatments were highly heterogeneous, most likely due to variance in the comparison treatments. There was evidence from 2 studies that lidocaine injection may be more effective in reducing pain than dry needling at 4 weeks.”** |
| **Levels of Evidence:** (For Therapy/Prevention, Etiology/Harm) See <http://www.cebm.net/index.aspx?o=1025>[x]  **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[x]  **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**[x]  **A** – Consistent, good quality patient oriented evidence[x]  **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):** |
| 1. **Based on this article, this type of treatment should only be considered as a management of pain in emergency situations while the underlying etiology is addressed. The article notes that the results of such techniques are temporary and should not be used as a final treatment for myofascial pain.**
2. **“TPI+SS therapy over splint use alone was shown to be a more effective method for decreasing VAS pain scores in TMD patients in this study.”**
3. **“Findings of studies that compared dry needling to other treatments were highly heterogeneous, most likely due to variance in the comparison treatments. There was evidence from 2 studies that lidocaine injection may be more effective in reducing pain than dry needling at 4 weeks.”**

Lidocaine too should be the substance of choice as it yields similar results to the others and is significantly less expensive. |