
Peer Review File

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Reviewer A

This narrative review provides some interesting findings. However, in the body of the text there is a lack of a Materials and Methods section nor a Results section. Hence, the reader is left to guess about the integrity of the included studies and findings thereof. This is a major oversight which certainly plagues the legitimacy of the authors' efforts. The authors mention the use of local anesthetic in the form of wet needling. Is it merely the anesthetic agent used or does this also include vasoconstrictor? Please elaborate. When wet needling is employed, is the technique merely a straight, single injection or does it involve a technique of "fanning the needle" similar to that described by the authors with dry needling?

The following section has been added

The local anesthetic (Lidocaine) trigger point injection:

Lidocaine local anesthesia potentially exhibits pain reduction properties in various painful situations by blocking the voltage-gated sodium channels, resulting in a reversible block of action potential propagation (52). When the local anesthetic is tied up to the sodium channel, the flow of Na⁺ is discontinued, and action potential generation and propagation are inhibited (53). However, there are several contraindications to the injection therapy, such as allergy to the local anesthetic, inflammation or infection in the muscle (myositis), acute muscle injury or trauma, and prolonged bleeding tendency or use of anticoagulant medications (54). A clinical protocol and technique have been elicited in Figures 1 and 2.

The authors state the following: "There are two types of injections, diagnostic and therapeutic injections (38). Diagnostic injections differentiate between the site and the source of pain. In

comparison, therapeutic injection aims to relieve tightness and pain by inactivating the involved muscle's trigger points (39).” Firstly, do injections have to be only either diagnostic or therapeutic? Can they not be both? Also, it should be mentioned there are contrarian viewpoints as to the existence of trigger points and the mechanisms of action of various interventions as it relates to trigger points. (Quintner JL, Bove GM, Cohen ML. A critical evaluation of the trigger point phenomenon. *Rheumatology* 2015;54:392-9.) Are the theoretical mechanisms of action (other than those related to Na channels due to the local anesthetic) of each technique not similar due to the inherent production of a nociceptive and inflammatory process from the trauma inflicted by the placement of a sharp foreign object?

Are the contraindications and/or limitations for both wet and dry needling not the same since both are employing a nociceptive stimulus (needle stick) albeit one has local anesthetic and the other does not?

“This can be explained by the effect of the anesthetic on the refractory period of the peripheral nerves by lengthening it and restricting the of frequency impulse conduction (49, 67). Are there words missing from this statement?

The authors do not provide any explanations regarding the following points: Does the diameter (gauge) of the different needles used with wet compared to dry needling technique have any influence on outcomes?

How do the authors account for the lack of any significant difference outcome between dry needling and placebo? (Ref #59: Tough E, White A, Cummings T et al. Acupuncture and dry needling in the management of myofascial trigger point pain: a systematic review and meta-analysis of randomised controlled trials. *Eur J Pain*, 2009. 13(1): p. 3-10.)

The references need to be closely scrutinized for formatting especially #15, #20, #29, #45, #66, #67 + #72.

Are the contraindications or limitations for both wet and dry needling not the same since both are employing a nociceptive stimulus (needle stick) albeit one has local anesthetic and the other does not? “This can be explained by the effect of the anesthetic on the refractory period of the peripheral nerves by lengthening it and restricting the of frequency impulse conduction (49, 67). Are there words missing from this statement? The authors do not provide any explanations regarding the following points: Does the diameter (gauge) of the different needles used with wet compared to dry needling technique have any influence on outcomes?

The following has been added

Trigger Point Injections

Trigger point injections have used throughout the body for managing pain and discomfort. These can include anesthetics, Botox or corticosteroids in some cases. Prior studies do not indicate any technique being superior, but wet needling does provide an immediate and, in some cases, a sustained analgesic effect that can last for a few weeks (45). However, larger sample sized studies are required.

Therefore, providing a trigger point injection with local anesthesia is recommended (52).

Previous studies have looked at the effect of needle size on trigger point injections and found no differences (53). However, the length of a needle should not need full length insertion. A 21 -25-gauge needle is the most often reported for the injections.

Wet versus dry needling

Injection techniques are commonly used for muscle pain, particularly myofascial TrP pain. They aim to inactivate TrP and relieve pain and tightness in the affected muscle (45). It includes "dry needling" (no pharmacologic agent used) or injection with a pharmacologic agent such as a local anesthetic (46). Dry needling is performed by repeatedly moving a needle around the trigger point to disrupt the fibrous bands mechanically (47). The local anesthetic injection may help reduce muscle pain by disrupting the taut bands of tissue via hydrostatic pressure of the solution and blocking pain input to encourage normal muscle movement (48). The combination of dry needling and local anesthetic might reduce post-injection soreness (49, 50). Therefore, providing a trigger point injection with local anesthesia is recommended (51). Previous studies have assessed the efficacy of acupuncture/dry needling in the management of TrPs in various body regions (70). Areas studied include the upper quarter, lower back, and lower extremities. Overall results indicate limited evidence that dry needling has an overall effect when compared to standardized care (71). Another meta-analysis (64) that included 4 studies compared the efficacy of dry needling versus sham (placebo), reported no statistical significance between both interventions. However, the results suggested that dry needling had an overall positive treatment effect on TrP pain (64). Moreover, studies conducted by the American Physical Therapy Association reported that the discomfort during and after lidocaine anesthetic injections was found to be significantly low (72). The pain was reported only by 20% of the patients in the injection groups (72). Utilization of the local anesthetic in the TrP injections could be the reason behind the decreased sensation of discomfort reported by the patients (73). This can be explained by the effect of the local anesthetics on the relative refractory period of the peripheral nerves by lengthening it and limiting the impulse conduction's maximum frequency (54). Additionally, utilizing local anesthetics in TrP injections can lead to a reduction in pain initially, hence

increasing the patient's confidence in the physician as well as their compliance with exercise program post injections (74). Safety is a favorable outcome that is highly relevant when it comes to the application of needling intervention (74). Most studies (75-77) have reported an adverse effect of post-needling soreness after either dry needling or TrP injections. Boyce et al., (78) reported that minor adverse events post dry needling can be seen in up to 37% of the patients, with bleeding (16%), bruising (7.7%), and pain during dry needling (5.9%) being the most frequent (79). Post-needling soreness is due to tissue damage during the insertion of the needle (80). A study by Nowak, Chęciński (57) showed that needling therapies for masticatory muscle pain provide a satisfactory effect in pain reduction.

The discussion and conclusion have been updated to

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studies have assessed the efficacy of acupuncture/dry needling in the management of TrPs in various body regions (72). Areas studied include the upper quarter, lower back, and lower extremities. Overall results indicate limited evidence that dry needling has an overall effect when compared to standardized care (73). Another meta-analysis (66) that included 4 studies compared the efficacy of dry needling versus sham (placebo), reported no statistical significance between both interventions. However, the results suggested that dry needling had an overall positive treatment effect on TrP pain (66). Moreover, studies conducted by the American Physical Therapy Association reported that the discomfort during and after lidocaine anesthetic injections was found to be significantly low (74). The pain was reported only by 20% of the patients in the injection groups (74). Utilization of the local anesthetic in the TrP injections could be the reason behind the decreased sensation of discomfort reported by the patients (75). This can be explained by the effect of the local anesthetics on the relative refractory period of the peripheral nerves by lengthening it and limiting the impulse conduction's maximum frequency (56). Additionally, utilizing local anesthetics in TrP injections can lead to a reduction in pain initially, hence increasing the patient's confidence in the physician as well as their compliance with exercise program post injections (76). Safety is a favorable outcome that is highly relevant when it comes to the application of needling intervention (76). Most studies (77-79) have reported an adverse effect of post-needling soreness after either dry needling or TrP injections. Boyce et al., (80) reported that minor adverse events post dry needling can be seen in up to 37% of the patients, with bleeding (16%), bruising (7.7%), and pain during dry needling (5.9%) being the most frequent (81). Post-needling soreness is due to tissue damage during the insertion of the needle (82). A study by Nowak, Chęciński (59) showed that needling therapies for masticatory muscle pain provide a satisfactory effect in pain reduction.

Conclusion

Trigger point injections are a minimally invasive and targeted approach that can be used as a diagnostic and therapeutic tool in management of myofascial pain. Both techniques have shown advantages and disadvantages regarding clinical efficacy and post needling soreness. However, regardless of the technique used it is beneficial in immediate and gradual relief of pain. Trigger point injections with lidocaine do indicate a slight advantage over dry needling due to its immediate analgesic effect but side effects reported are same. Future studies are required to investigate the management and efficacy of trigger points injections.

The following has been added in the end of the introduction

Most studies (75-77) have reported an adverse effect of post-needling soreness after either dry needling or TrP injections. Boyce et al., (78) reported that minor adverse events post dry needling can be seen in up to 37% of the patients, with bleeding (16%), bruising (7.7%), and pain during dry needling (5.9%) being the most frequent (79). Post-needling soreness is due to tissue damage during the insertion of the needle (80). A study by Nowak, Chęciński (57) showed that needling therapies for masticatory muscle pain provide a satisfactory effect in pain reduction.

Reviewer B

Overall, the paper is logically organized. It is a very informative paper.

It should be emphasized that trigger point injections have been reported to be effective not only in the head, but also in various other areas, including the trunk and buttocks. There are also reports of therapeutic effects of ultrasound-guided injections as a method of treating myofascial pain, and it would be helpful to cite and convey this information in the paper. (Kaga M, Ueda T. Effectiveness of Hydro-Dissection of the Piriformis Muscle Plus Low-Dose Local Anesthetic

Injection for Piriformis Syndrome: A Report of 2 Cases. Am J Case Rep. 2022 Feb 6;23:e935346. doi: 10.12659/AJCR.935346. PMID: 35124689; PMCID: PMC8829885. / Kaga M. First Case of Occipital Neuralgia Treated by Fascial Hydrodissection. Am J Case Rep. 2022 May 17;23:e936475. doi: 10.12659/AJCR.936475. PMID: 35578561; PMCID: PMC9125529.)

The quality of the papers will be better.

Currently, treatment methods for myofascial pain are evolving, including a new treatment technique called transversus abdominis plane hydrodissection for myofascial pain in the oblique abdominal muscles. And a new condition called ventral ramus of spinal nerve entrapment syndrome (VERNES) has been reported as a cause of myofascial pain. Authors should cite the paper as the latest findings (Kaga M. A Case Report on Abdominal Pain Treated With a New Technique of Ultrasound-Guided Transversus Abdominis Plane Hydrodissection Using a Low Concentration of Local Anesthetics. Cureus. 2022 Nov 28;14(11):e31966. doi: 10.7759/cureus.31966. PMID: 36582553; PMCID: PMC9795083.)

Comment B: Thank you for your valuable comment. The statement has been added as follows:

Piriformis syndrome has a negative impact on most patients' daily lives making it difficult walking and the inability to maintain a sitting or supine posture. Different types of treatment methods have been used to treat PS patients, such as local anesthetic injection, steroid injection, and local botulinum toxin injection. Hydro-dissection by ultrasound-guided injection of a very low concentration of local anesthetic is effective and has a lower risk of adverse effects, thus making it more convenient for the treatment of piriformis syndrome than conventional treatments, such as local anesthetics, steroids, and botulinum toxin injection.

Reference: Kaga M, Ueda T. Effectiveness of Hydro-Dissection of the Piriformis Muscle Plus
Low-Dose Local Anesthetic Injection for Piriformis Syndrome: A Report of 2 Cases. *Am J Case
Rep.* 2022 Feb 6;23:e935346. doi: 10.12659/AJCR.935346. PMID: 35124689; PMCID:
PMC8829885