

ORIGINAL ARTICLE

EFFECT OF DRY NEEDLING ON PAIN AMONG YOUNG ADULTS WITH TRAPEZIUS MYOFASCIAL TRIGGER POINTS

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ABSTRACT:

Introduction: Myofascial trigger points in the trapezius muscle cause neck and shoulder pain, often due to poor posture or overuse. Dry needling was a minimally invasive treatment used to relieve such pain by targeting these trigger points. Although dry needling was used for myofascial pain, its effects on the upper and middle trapezius fibres in young adults were not well studied. This research aimed to address that gap.

Methodology: A pre-post experimental study was conducted on 56 young adults (18–25 years) with active trigger points in the upper and middle trapezius. After taking basic demographic data & pain status, dry needling was done on upper & middle trapezius following standard procedures. Pain was measured using NPRS: before, immediately after treatment and 24 hours after a single dry needling session.

Results: Dry needling significantly reduced pain in participants both immediately and 24 hours post-treatment, as shown by statistical analysis ($p < 0.0001$).

Conclusion: The present study concluded that dry needling was effective in reducing pain among young adults with myofascial trigger points in the upper and middle trapezius muscles.

Keywords: Dry needling, Trapezius Pain, Myofascial trigger points, Numerical Pain Rating Scale (NPRS), Manual therapy.

INTRODUCTION:

Trapezius muscle helps in conduct of telling shoulders and neck movements like extension of a neck, which was produced by bilateral compression of descending trapezius filaments, while side flexion of neck was produced by unilateral compression of descending fibres. The trigger points were hyperirritable and spontaneously painful nodules.¹ It's a tender spot on the tense band, appertained pain or altered sensation at least 2 cm beyond the spot, inspired by pressure held for lower than 10 seconds; and occasionally it may circumscribe cervical ROM in the joint.²

Trigger points causing pain at rest were called active trigger points while trigger points causing pain on palpation were called idle trigger point.³ When similar repetitious micro trauma occurred with

participants like FHP(Forward head posture) also muscle goes in spasm and there's conformation of actuated trigger points. The pain generally arises due to overuse of the muscle in non-ergonomic posture, working in static position, stress and pressure, repetitious movements, sitting for protract period of time without support, too high keyboard on divisions, long drives on bikes and buses, protract head bending conditioning(reading/ looking through microscope/ dentistry), tight pectorals major and minor muscles, conditioning with unforeseen bone sided movements.⁴

The pathogenesis of trigger point could be explained as the areas of stressed-out soft towel entering lower oxygen, glucose, and nutrient delivery, and latterly accumulating high situations of metabolic waste products and ending up with the development of Trigger Points.

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Dry needling (also known as intramuscular stimulation, or intramuscular needling) was a treatment fashion that has been employed by physiotherapists in Canada, Chile, Ireland, Spain, south Africa and the United Kingdom since the 1980's, and in the United States since 1984.^{3,4}

Trigger point dry needling has its origins in the work of Karel Lewit of Czechoslovakia. In his classic work, he examined the short and long-term goals of dry needling in the treatment of myofascial pain in 241 cases with 312 painful MTrP spots. He reported an immediate analgesic effect without hyperesthesia in 86 of cases when the most painful position was engaged by the needle. He has expressed “needle effect” where the analgesic effect of the needle was distinct from that of the injectable substance.⁵

Dry needling was a minimally invasive system that has lately gained popularity for the treatment of MTrPs (myofascial trigger points). Dry needling involves setting an acupuncture needle directly into an MTrP (myofascial trigger points) without injection of material. The needle may create a small, localized lesion that stimulates satellite cell migration to the affected area, helping to repair or replace damaged muscle fibers and produce a localized stretch in the cytoskeletal structures. This stretch may allow sarcomeres to renew their resting length, Electrical polarization of muscle and connective tissue. The mechanical pressure causes collagen fibers to generate natural electrical signals, which stimulate connective tissue remodeling. This process generates an action potential that facilitates the release of actin–myosin cross-bridges, leading to muscle lengthening, reduced pain, and improved range of motion after treatment.⁶ This study aimed to study the effect of dry needling on pain among young adults with trapezius myofascial trigger point. The Objectives of this study was to study the effect of dry needling on pain among young adults with

trapezius myofascial trigger point of upper and middle fibers and to compare the changes in the pain intensity immediately & 24 hours after dry needling using numerical pain rating scale.

METHODOLOGY:

The study was designed as a pre-post experimental study and was conducted at the Dr. Ulhas Patil College of Physiotherapy OPD in Jalgaon. The duration of the study was six months. The target population consisted of young adults aged 18 to 25 years who had myofascial trigger points. A total sample size of 56 participants was selected using convenient sampling. This study included young adults between the ages of 18 and 25 years who had at least one active myofascial trigger point in both the upper and middle trapezius muscles. This study excluded subjects who had needle phobia, a history of abnormal reactions to needling or injections, or who were on anticoagulant therapy. It also excluded individuals with any vascular diseases, any cervical conditions, or skin infections around the upper and middle trapezius areas.

The Ethical Clearance for Study Was Taken from The Institutional Ethics Committee & Principal of Dr. Ulhas Patil College of Physiotherapy. Participants with active myofascial trigger point of upper & middle trapezius were recruited by using convenient sampling.

The outcome measure NPRS was taken at baseline and on the last day.

PALPATION OF TRIGGER POINT:

The patient was positioned in sitting. The therapist performed flat palpation to detect the taut band of the upper and middle trapezius. After that, the therapist used snapping palpation to identify the nodule-like structure. Once the trigger point was detected, the therapist located and grasped the trigger point using pincer palpation to apply pressure.



Figure 1: Palpating upper trapezius trigger points



Figure 2: Upper trapezius MTrP palpation

OUTCOME MEASURES

1. Numeric pain rating scale: NPRS will be used to assess the pain intensity pre and post treatment to evaluate the change in pain intensity if any. The NPRS showed good reliability (ICC=0.82-0.90) for moderate to high pain intensities, though reliability decreases for low-intensity stimuli (ICC=0.60).⁷

INTERVENTION

The patient was positioned in prone lying, and the therapist stood on the involved side of the subject. The treatment area was properly exposed, and a 0.25/0.50-gauge sterile acupuncture needle was used. The exposed area was wiped with spirit, after which the nodules

were palpated; the needle with its plastic guide tube was placed over the myofascial trigger point, and a tapping movement was performed to elicit a twitch response, which was the aim of dry needling. When the needle was inserted into the trigger point at an angle of 30 degrees, the fanning technique was performed, and the needle was kept in place for a few seconds before being removed. The subject was advised not to perform any physical activity for 24 hours, and NPRS scores were taken before treatment, immediately after treatment, and again after 24 hours of the intervention.



Figure 3: Upper trapezius dry needling

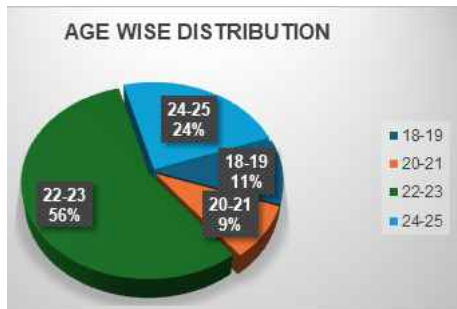


Figure 4: Trigger point needling of the upper trapezius

RESULT:

Table 1: Age wise distribution of study subjects

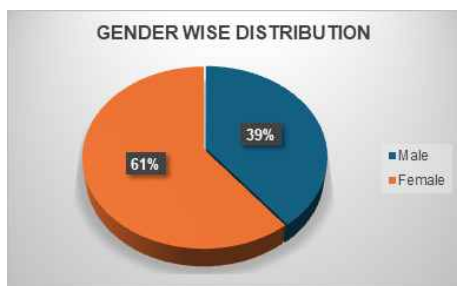
Age	Total No. of Patients
18-19	6
20-21	5
22-23	31
24-25	13



Graph 1: Age wise distribution of study subjects

Table 2: Gender distribution of study subjects

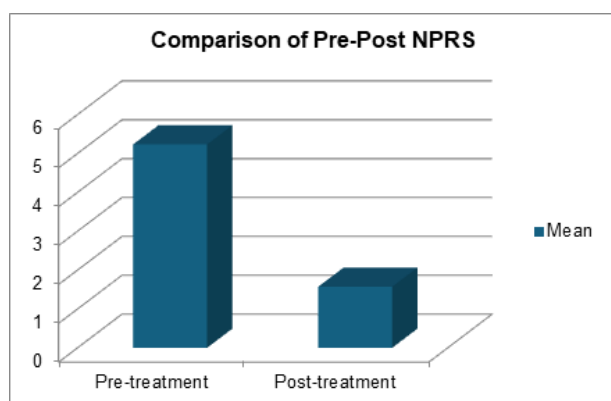
Gender	Total Number
Male	22
Female	34



Graph 2: Gender distribution of study subjects

Table 3: Pre post comparison of pain after dry needling

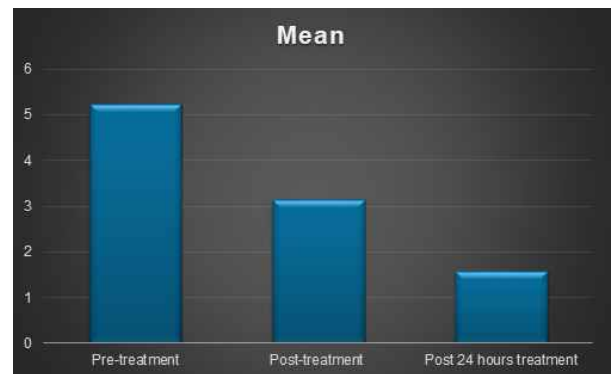
NPRS	Mean + Sd	t value	p value	Significance
Pre-Treatment	5.232 ± 0.71	27.5	<0.0001	Extremely Significant
Post-Treatment	1.571 ± 0.82			



Graph 3: Pre Post Comparison of Pain After Dry Needling

Table 4: Comparison of changes in pain before, after & 24 hrs after dry needling

NPRS	Mean + Sd	p Value	Significance
Pre-Treatment	5.232 ± 0.71	<0.0001	Extremely Significant
Post-Treatment	3.142 ± 0.72		
Post-Treatment 24 hours	1.571 ± 0.82		



Graph 4: Comparison of changes in pain before, after & 24 hrs after dry needling

DISCUSSION

This study was designed to see the effect of dry needling in patients with myofascial trigger points in upper & middle fibers. This study proved the efficacy of dry needling on myofascial trigger points by reducing pain intensity⁸. In this study there were 56 participants, among which 39 were male and 61 were female. In this study the participants were between the age groups of 18- 25. Which was divided into 4 sub-groups i.e. between 18 - 19 times of age there was 11, 20 - 21 there was 9, 22 - 23 there was 56 & 24 - 25 was 24.

The immediate pain relief after dry needling occurred because of likely medium of pain hyperstimulation analgesia, which was firstly proposed by melzack & he concluded that DN may stimulate, both large, myelinated filaments (i.e., Aβ and αδ- filaments), as well as c-filaments, laterally via the release of inflammatory mediators⁹. The increased neuromuscular junction response appeared to be associated with higher concentrations of biochemical substances, such as substance P and

calcitonin gene-related peptide (CGRP), around active myofascial trigger points. It has been shown that the situations of similar biochemical drop immediately after DN. Also, CGRP can increase the release of ACh from the motor endplate and drop the effectiveness of acetylcholinesterase in the synaptic split and enhance ACh receptor effectiveness at the same time thus, DN by modulating the biochemical milieu of MTrPs, can lead to reduction of ACh efficacy and accordingly drop the P of the motor endplate.[10] Another study conducted by Chou et al. that DN (dry needling) may stimulate, both large, myelinated filaments (i.e., A β and A δ -filaments), as well as C- filaments, laterally via the release of inflammatory mediators.¹¹

As a result of mechanical stimulation, A β - & A δ -filaments were both activated and send afferent signals to the dorsolateral tracts of the spinal cord and could activate the supraspinal and advanced centers involved in pain processing.¹²

It has been demonstrated that dry needling may influence the SEA (spontaneous electrical activity) by eliciting a LTR (local twitch response). Both chen et al and hsieh et al. concluded that DN to a MTrP region could effectively suppress SEA, when LTRs were elicited. They suggest that the insertion of a needle at the endplate region may lead to increased discharges and thereby immediately reduce available Ach stores, leading to a lesser SEA.¹²

This study subject's showed significant reduction in pain intensity after performing dry needling in upper and middle trapezius myofascial trigger point patient. On intra group comparison using paired t- test mean of pre & post NPRS intervention score was 5.232 ± 0.71 and 1.571 ± 0.82 independently with p- value < 0.0001 Which was extremely significant. On comparison of pain changes between pre-treatment was 5.232 ± 0.71 , incontinently after treatment it was 3.142 ± 0.72 & post 24 hrs of

treatment the NPRS score was 1.571 ± 0.82 independently with p- value < 0.0001 which was also extremely significant.

This study evaluated the effect of dry needling on pain intensity in young adults with myofascial trigger points in the upper and middle trapezius muscles. The findings demonstrated that dry needling was effective in significantly reducing pain immediately after treatment and at 24 hours post-intervention. The reduction in pain intensity observed in this study supports previous research indicating the efficacy of dry needling in managing myofascial trigger point pain. The immediate analgesic effect of dry needling may be attributed to hyperstimulation analgesia, involving activation of both myelinated (A β and A δ) and unmyelinated (C) nerve fibers. This neural stimulation was thought to influence spinal and supraspinal pain modulation pathways. Additionally, dry needling may alter the biochemical environment of active trigger points by reducing levels of pain-related substances such as substance P and calcitonin gene-related peptide (CGRP), leading to decreased motor endplate activity and reduced muscle hyperexcitability.

Furthermore, elicitation of local twitch responses during dry needling has been shown to suppress spontaneous electrical activity at the motor endplate, resulting in reduced acetylcholine availability and subsequent pain relief. Overall, the statistically significant reduction in Numerical Pain Rating Scale (NPRS) scores confirms the short-term effectiveness of dry needling as an intervention for trapezius myofascial trigger point pain in young adults.

CONCLUSION

The present study concluded that Dry Needling was effective on reducing pain among young adults with upper & middle trapezius myofascial trigger point.

LIMITATION

1. Pain outcomes were assessed only immediately after treatment and at 24 hours post-intervention. The study does not provide information on the medium- or long-term effects of dry needling, making it unclear whether pain reduction was sustained over time.

2. The intervention consisted of only one dry needling session. In clinical practice, multiple sessions were often required. Therefore, the results may not reflect the full therapeutic potential or typical clinical outcomes of dry needling.

3. Neither the participants nor the assessor appears to have been blinded. This may have introduced measurement and performance bias, particularly given the subjective nature of pain assessment.

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Ethical Approval: Ethical committee approval obtained from institution.

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Conflict of Interest: The authors declare no conflict of interest

REFERENCES

1. Abbaszadeh-Amirdehi M, Ansari NN, Naghdi S, Olyaei G, Nourbakhsh MR. Therapeutic effects of dry needling in patients with upper trapezius myofascial trigger points. *Acupunct Med.* 2017 Apr;35(2):85-92. doi:10.1136/acupmed-2016-011082. Epub 2016 Oct 3. PMID: 27697768; PMCID: PMC5466920.
2. Steden, Elisabeth. (2023). *Palliativmedizinische Einrichtungen in Deutschland :Bestandsaufnahme und Entwicklung*. Köln, Univ., Diss., 1999.
3. Ajmera MA, Patil M. Effect of dry needling and IASTM in chronic upper trapezitis: A Randomised controlled trial.
4. Bron C, Dommerholt JD. Etiology of myofascial trigger points. *Curr Pain Headache Rep.* 2012 Oct;16(5):439-44.
5. Vispute, Sai & Kumar, Neeraj. (2022). A Comparative Study of Immediate Effects of Myofascial Release Technique and Positional Release Technique on Trapezitis among the College Students. *International Journal of Physiotherapy and Research.* 10. 4243-4249. 10.16965/ijpr.2022.122.
6. Kim BB, Lee JH, Jeong HJ, Cynn HS. Effects of suboccipital release with craniocervical flexion exercise on craniocervical alignment and extrinsic cervical muscle activity in subjects with forward head posture. *J Electromyogr Kinesiol.* 2016 Oct; 30:31-7. doi: 10.1016/j.jelekin.2016.05.007. Epub 2016 May 24. PMID: 27261928.
7. Modarresi S, Lukacs MJ, Ghodrati M, Salim S, MacDermid JC, Walton DM; CATWAD Consortium Group. A Systematic Review and Synthesis of Psychometric Properties of the Numeric Pain Rating Scale and the Visual Analog Scale for Use in People With Neck Pain. *Clin J Pain.* 2021 Oct 26;38(2):132-148. doi: 10.1097/AJP.0000000000000999. PMID: 34699406.
8. Graff-Radford SB, Reeves JL, Baker RL, Chiu D. Effects of transcutaneous electrical nerve stimulation on myofascial pain and trigger point sensitivity. *Pain.* 1989 Apr;37(1):1-5. doi: 10.1016/0304-3959(89)90146-2. PMID: 2786179.
9. Unverzagt C, Berglund K, Thomas JJ. Dry needling for myofascial trigger point pain: a clinical commentary. *Int J Sports Phys Ther.* 2015 Jun;10(3):402-18. PMID: 26075156; PMCID: PMC4458928

10. Vulfsons S, Ratmansky M, Kalichman L. Trigger point needling: techniques and outcome. *Curr Pain Headache Rep.* 2012 Oct;16(5):407-12. doi: 10.1007/s11916-012-0279-6. PMID: 22610507.
11. Kalichman L, Vulfsons S. Dry needling in the management of musculoskeletal pain. *J Am Board Fam Med.* 2010 Sep-Oct;23(5):640-6. doi: 10.3122/jabfm.2010.05.090296. PMID: 20823359.
12. Griswold D, Gargano F, Learman KE. A randomized clinical trial comparing non-thrust manipulation with segmental and distal dry needling on pain, disability, and rate of recovery for patients with non-specific low back pain. *J Man Manip Ther.* 2019 Jul;27(3):141-151. doi: 10.1080/10669817.2019.1574389. Epub 2019 Feb 9. PMID: 30935327; PMCID: PMC6598540.