OPEN ACCESS

ORIGINAL ARTICLE

Effectiveness of Dry Needling Versus Trigger Point Compression Release among Patients with Neck Pain - RCT

Saad Tariq[1], Mamoona Tasleem Afzal[2], Anam Javed[3], Iqra Naseem[4], Nasir Khan[5], Mohammad Shakir Khan[6]

[1] Lecturer, Institute of Rehabilitation Sciences, Shaheed Zulfiqar Ali Bhutto Medical University Islamabad, Pakistan
[2] Senior Lecturer, Institute of Rehabilitation Sciences, Shaheed Zulfiqar Ali Bhutto Medical University Islamabad, Pakistan
[3] HOD, Physical Therapy Department, Bashir Institute of Health Sciences Islamabad, Pakistan
[4] Disability Assessor, Independent Assessment Service, Ilford, UK
[5] Assistant Professor, Physical Therapy Department, Bashir Institute of Health Sciences Islamabad, Pakistan
[6] Physical Therapist, Physio and Rehab, Bahria Active, Rawalpindi, Pakistan

Author`s Contribution

[1 2] Substantial contributions to the conception or design of the work for the acquisition, analysis or interpretation of data for the work, [3 4 6] Drafting the work or reviewing it critically for important intellectual content, [4 5] Final approval of the version to be published, [2] Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Article Info.

Received: July 07, 2024
Acceptance: January 23, 2025

Conflict of Interest: None
Funding Sources: None

Address of Correspondence

Name: Mamoona Tasleem Afzal
drmamoonatasleem@szabmu.edu.pk
ORCID: 0000-0003-4473-2476

Cite this article as: Tariq S, Afzal T M, Javed A, Naseem I, Khan N, Khan S M, Effectiveness of Dry Needling Versus Trigger Point Compression Release among Patients with Neck Pain. JRCRS.2025:13(1):17-20.
https://dx.doi.org/10.53389/JRCRS.2025130104

A B S T R A C T

Background: Neck pain is a disorder that has lifetime and point prevalence almost as high as low back pain. It also leads to substantial disability and economic burden on society. Physical therapists use several interventions with this population such as ischemic compression which is a standard treatment used for the treatment of trigger point release in routine physical therapy practice. Dry needling is comparatively a newer treatment intervention in practice now for the relieve of pain causing trigger points not specifically in case of neck pain but in other condition such as Fibromyalgia, Myofascial Pain Syndrome as well.

Objective: To determine the effectiveness of Trigger point Dry Needling compared with ischemic compression release in the patients having neck pain due to myofascial trigger points and to create awareness about better treatment intervention for trigger point release among medical community.

Methodology: A Randomized Clinical Trail of 16 weeks duration is conducted in Physical Therapy Department of Holy Family Hospital Rawalpindi comprised of patients with neck pain associated with trigger points. A sample of 30 patients was taken fulfilling the inclusion & exclusion criteria. Initially the patients were recruited using non-probability convenient sampling, later the allocation between the groups was done randomly using sealed envelope method. Participants were randomly divided in dry needling group (N = 15) and trigger point compression release group (N = 15). The data was collected at 1st week and final (4th) week. Improvement was assessed through Visual Analog Scale(VAS) and Northwick Park Neck Pain Questionnaire(NPQ).

Results: Findings from independent t- test used for comparison between the two groups showed significant p-value at the final week which is less than 0.05 for both VAS and NPQ (P=0.038; 0.018 respectively). Within the group comparison using repeated measure ANOVA showed significant improvement in the experimental group for both the variables after week 2, with the significant value of wilk's lambda ^ (^=0.001) which is less than 0.05.

Conclusion: Dry needling is more effective than ischemic compression for the trigger point release.

Key Words: Dry needling, Ischemic compression, Neck pain

Introduction

Neck pain is a major health issue, affecting 45%-54% of the general population.[1] It is estimated varyingly on the basis of definitions used and populations studied. Common reasons of neck pain are trigger points myofascial pain syndrome and faulty postures. Trigger points may cause discomfort and functional incapacity from several areas of the body; for example, neck and shoulder could have negative impact on social and professional life. Quality of life may also be

severely affected by this.[2, 3] The prevalence of pain related to the spine has been reported to be varying from 54% to 80% in the lifetime. [4] The prevalence of persistent muscular Skelton (MSK) neck pain in an adolescent is reported to be ranging from 2% to 40% and 30% to 50% of the general populations of adolescents may have MSK neck pain in any given year. As the age increases the prevalence of neck pain also increases, and it is maximum in middle age and for women it is higher.[3, 5]

Lifetime and point prevalence of neck pain is high as compare to low back pain.[6] Patients suffering from cervical pain often come for physical treatment for managing pain symptoms. Ischemic compression has also been in wide use to cure pain in the neck by applying sufficient continued pressure on a trigger point with a bearable amount of pain is gradually increased as pain is reduced, hence this modality is highly and most commonly used in daily practice. The procedure Dry needling (DN) is highly in trend since the last couple of years [7, 8] It is a form of insertion of a fine, solid, filiform needle without administering of any analgesic medication.[8] According to the systematic review, dry needling is effective to reduce pain severity while side-bending range of motion is increase by both ischemic compression and dry needling.[9] Through the 1 session of trigger point dry needling, range of motion in cervical region improve due to increase in pressure pain threshold and decrease in neck pain.[10, 11] in people with myofascial trigger point in the neck, dry needling and trigger point compression led to a 3 months betterment in pain intensity and disability .[12, 13]

Both techniques are effective to reduce the neck pain. On the other hand, there is conflicting evidence which one of them works better; hence, no firm conclusion can be arrived at for the time being. In order to establish a definitive conclusion on the superiority of either intervention, the purpose of this study was to find out the effects of Trigger point Dry Needling compared with ischemic compression release in the patients having neck pain due to myofascial trigger points and to create awareness about better treatment intervention for trigger point release among medical community.

Methodology

A single blinded RCT was conducted in Physical Therapy Department of Holy Family Hospital Rawalpindi. Patients with neck pain were randomly allocated in experimental (n=15) and control group (n=15). Sample size of 30 participants (no dropout), 15 in each group, determined using the open Epitool calculator. Informed consent forms were signed by all the participants. Research Permission was taken from REC of Bashir Institute of Health Sciences (B1-80/DPT-2019) to conduct the study.20-40 years old patients (male and female) presented with neck pain due to MTrP's (Myofascial Trigger Points) were included. Assessment was done at baseline (0 week) and after 1, 2, 3 weeks of intervention. Visual Analog Scale and Northwick Park Neck Pain Questionnaire were used as the outcome measures. Reliability and validity score of VAS and Northwick park neck pain question were 0.97 [95% CI = 0.96 to 0.98] and 0.935 respectively. (12)

Interventions: After initial assessment experimental group received dry needling for the trigger point (TrP) release on 3 days a week aimed at pain relief while ischemic compression is applied on control group for trigger point release on 3 days a week.

Dry Needle (ND) target the posterior musculature of the cervical spine. DN was made using disposable stainless-steel needles (0.3 × 30 mm) injected into the skin over the TrP area, using the fast-in and fast-out procedure. The overlying skin was cleaned with alcohol after the location of TrP by pincer palpation in the upper trapezius. Then the needle was advanced to perforate the skin 10 to 15 mm into the TrP until a local twitch response was elicited. After elicitation of the first local twitch response, the needle was moved up and down in 2- to 3-mm vertical motions without rotations at about 1 Hz for 25 to 30 seconds.

Ischemic Compression, this was done by the application of sustained deep pressure with the thumb to the upper trapezius TrP for 30 s–1 min. When the tension in the TrP decreased or when the TrP was no longer sensitive or one minute had passed, whichever came first, Pressure was released.

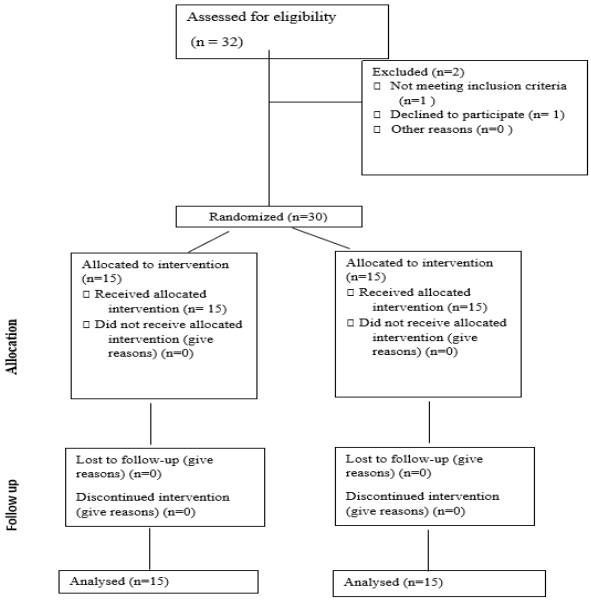

Figure 1: CONSORT Diagram

Comparison between control group and experimental group was done through SPSS 21.Normality test was applied to all variables to check the homogeneity of a sample at baseline. The selection of applying parametric or non-parametric test was made on the basis of Shapiro Wilk test value. The P value of all variables was p>0.05. For this reason, the parametric test was used to assess the difference. Independent sample T-test was applied to check the differences between two groups at baseline and after 1, 2, 3 weeks of interventions. Repeated measures ANOVA is used for week wise comparison within the groups.

Lambda measures the percentage of variance in dependent variables left unaccounted for by variation in levels of the independent variable. Of course, a zero value would show that there is no variance beyond what the independent variable cannot account for—a perfect world. That is, the closer to zero the statistic is, the larger the contribution of the variable at hand to the model. It rejects the null hypothesis only when Wilk's lambda is close to zero, although this should be done in combination with a small p-value.

Results

There were total 30 participants in this study, 11 males and 19 females. Gender distribution was; 5 males and 10 females in Experimental group and 6 males and 9 females in control group. Comparison between experimental group that received dry needling and control group that received ischemic compression was made. Mean, SD and p value for baseline and post treatment evaluation of VAS and NPQ were mentioned. (table 1)

Within the group week wise comparison was done using Repeated Measure ANOVA. Both the variables showed significant improvement at final (4th) week. (Table 2) Within group week wise analysis done used repeated measure ANOVA showed significant improvement in the experimental group for both the variables at final week, with the significant value of wilk's lambda ^ (^=0.001) which is less than 0.05. (Table 2)

Table 1: Difference of Experimental and Control group regarding VAS and NPQ

Variables	Control Group Mean ± SD	Experimental Mean ± SD	P –value
VAS- BASELINE	7.47 ± 1.125	7.47 ± 0.99	1.000
VAS –FINAL	4.40 ± 1.84	2.73 ± 2.314	0.038*
NPQ-BASELINE	75.20 ± 14.269	71.74 ± 11.501	0.471
NPQ –FINAL	49.33 ± 8.754	34.20 ± 20.95	0.018*

VAS: Visual Analogue Scale, NPQ: Northwick Park Neck Pain Questionnaire, SD: Standard Deviation
Significance level: p<0.05*

Table 2: Shows within group comparison of VAS and NPQ at versus Final

Variables	Group A (Experimental)					Group B (Control)				
	Baseline		FINAL			Baseline		FINAL		
	Mean	SD	Mean	SD	p	Mean	SD	Mean	SD	P. Value
VAS	7.47	0.26	2.73	0.60	<0.001	7.47	0.29	4.40	0.47	<0.001***
NPQ	71.74	2.97	34.20	5.41	<0.001	75.20	3.68	49.33	2.26	<0.001***

Significance level: p<0.001***

Discussion

According to results, dry needling is more effective than ischemic compression for the trigger point release. According to systematic review, ischemic compression and DN to have a positive effect on pain intensity. Decrease in pain intensity is greater compared with active range of motion exercises (ischemic compression).both techniques increase the range of motion of side bending, with similar effects compared with lidocaine injection and a weak evidence about its effects on function and quality-of-life. [14] current study also showed that dry needling is more effective for the trigger point release in neck pain which increase the range of motion.

Another study which investigate the effect of dry needling (DN) in the treatment of trigger points (TPs) in the upper trapezius (UT) muscle. The ANOVA showed that there were significant differences between the dry needling and trigger point compression release groups with respect to the post-measurement VAS score (P=0.01).(15) According to recent study, Within group week wise analysis, repeated measure ANOVA showed significant improvement in the experimental group for both the variables after week 2, with the significant value of wilk's lambda ^ (^=0.001) which is less than 0.05.

Recent study states that there are subjects who received trigger point dry needling that had similar results with subjects who had undergone trigger point manual therapy as to pain, function and range of motion of neck, however, the patients receiving trigger point dry needling experienced more increase in PPT (decrease pressure threshold) than those who underwent trigger point manual therapy at all follow-up periods.[7, 15]which support the recent study's results, treatment evaluations of VAS, Mean and SD in case of experimental group was (M=2.73± SD=2.314) and p value (0.038), which showed the significant difference between the pain intensity and dry needling.

Some limitations of current study were: Collection of the data was done within a very short time as per the availability of the patient basis, a small sample of 30 consecutive patients was selected as per the follow up of the patients, limited resources, and both groups did not receive any home plan.

Conclusion

Findings from this study indicate that dry needling intervention as well as ischemic compression will decrease pain and functional disability as measured by the VAS and NPQ in treating the patients with trigger point in the neck region. But Dry Needling showed more significant results hence it is more effective than ischemic compression technique for trigger point release.

References

1. Fejer R, Kyvik KO, Hartvigsen J. The prevalence of neck pain in the world population: a systematic critical review of the literature. European spine journal. 2006;15:834-48.
2. Baldry PE. Acupuncture, trigger points and musculoskeletal pain: Elsevier; 1989.
3. Guez M, Hildingsson C, Nilsson M, Toolanen G. The prevalence of neck pain. Acta Orthopaedica Scandinavica. 2002;73(4):455-9.
4. Manchikanti L, Singh V, Datta S, Cohen SP, Hirsch JA. Comprehensive review of epidemiology, scope, and impact of spinal pain. Pain physician. 2009;12(4):E35.
5. Côté P, Cassidy JD, Carroll LJ, Kristman V. The annual incidence and course of neck pain in the general population: a population-based cohort study. Pain. 2004;112(3):267-73.
6. Llamas-Ramos R, Pecos-Martín D, Gallego-Izquierdo T, Llamas-Ramos I, Plaza-Manzano G, Ortega-Santiago R, et al. Comparison of the short-term outcomes between trigger point dry needling and trigger point manual therapy for the management of chronic mechanical neck pain: a randomized clinical trial. Journal of Orthopaedic & Sports Physical Therapy. 2014;44(11):852-61.
7. Kalichman L, Vulfsons S. Dry needling in the management of musculoskeletal pain. The Journal of the American Board of Family Medicine. 2010;23(5):640-6.
8. Cagnie B, Dewitte V, Barbe T, Timmermans F, Delrue N, Meeus M. Physiologic effects of dry needling. Current pain and headache reports. 2013;17:1-8.
9. Cagnie B, Castelein B, Pollie F, Steelant L, Verhoeyen H, Cools A. Evidence for the use of ischemic compression and dry needling in the management of trigger points of the upper trapezius in patients with neck pain: a systematic review. American journal of physical medicine & rehabilitation. 2015;94(7):573-83.
10. Mejuto-Vázquez MJ, Salom-Moreno J, Ortega-Santiago R, Truyols-Domínguez S, Fernández-De-Las-peñas C. Short-term changes in neck pain, widespread pressure pain sensitivity, and cervical range of motion after the application of trigger point dry needling in patients with acute mechanical neck pain: a randomized clinical trial. Journal of Orthopaedic & Sports Physical Therapy. 2014;44(4):252-60.
11. Rickards LD, Osteo M. Effectiveness of noninvasive treatments for active myofascial trigger point pain: a systematic review. Myofascial Trigger Points: Pathophysiology and Evidence-Informed Diagnosis and Management. 2011:129-52.
12. Ziaeifar M, Arab AM, Mosallanezhad Z, Nourbakhsh MR. Dry needling versus trigger point compression of the upper trapezius: a randomized clinical trial with two-week and three-month follow-up. Journal of Manual & Manipulative Therapy. 2019;27(3):152-61.
13. Irnich D, Behrens N, Gleditsch JM, Stör W, Schreiber MA, Schöps P, et al. Immediate effects of dry needling and acupuncture at distant points in chronic neck pain: results of a randomized, double-blind, sham-controlled crossover trial. Pain. 2002;99(1-2):83-9.
14. Dommerholt J, Mayoral del Moral O, Gröbli C. Trigger point dry needling. Journal of Manual & Manipulative Therapy. 2006;14(4):70E-87E.
15. Ziaeifar M, Arab AM, Karimi N, Nourbakhsh MR. The effect of dry needling on pain, pressure pain threshold and disability in patients with a myofascial trigger point in the upper trapezius muscle. Journal of bodywork and movement therapies. 2014;18(2):298-305.