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Original Article

Comparison Between the Effectiveness of Muscle Energy Technique and Ischemic Compression on Myofascial Trigger Points in Patients with Chronic Shoulder Pain

Kiran Bashir[1], Muhammad Salman Bashir[2], Muhammad Nazim Farooq[1], Fatima Amjad[1], Muhammad Kashif[2*] and Maryam Zafar[3]

[1]Islamabad College of physiotherapy, Margalla Institute of Health Sciences, Islamabad, Pakistan
[2]Riphah College of Rehabilitation and Allied Health Sciences, Riphah International University, Islamabad campus, Pakistan
[3]Islam College of Physical Therapist, Sialkot, Pakistan

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***Corresponding Author:**
Muhammad Kashif
Riphah College of Rehabilitation and Allied Health Sciences, Riphah International University, Campus, Islamabad, Pakistan
kashif.shaffi@gmail.com

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ABSTRACT

Patients with chronic shoulder pain often experience myofascial trigger points. An ischemic compression (IC) slows blood flow and relieves tension by applying sustained digital pressure for a specific period of time. MET, which stands for Muscle Energy Technique, is another manual method for releasing muscle tension (inhibition). **Objective:** To compare the effectiveness of muscle energy technique and ischemic compression on myofascial trigger points in patients with chronic shoulder pain. **Methods:** In this quasi-experimental study, 40 patients were enrolled from Physical Therapy Department, DHQ hospital Faisalabad, during September 2018 to March 2019. Patients were allocated into two groups. Muscle energy technique was applied on group A (n=20) and ischemic compression was applied on group B (n=20). Both groups received treatment three days a week for four weeks. Disabilities of Arm, Shoulder and Hand questionnaire, Neck Disability Index, Visual Analogue Scale and Goniometer were used to take measurements at baseline and after four weeks of treatment. SPSS 20.0 was used for data entry and analysis. Difference between two treatments was determined by using independent t-test. **Results:** A statistically significant difference was found between the two groups for all outcome measures ($p < 0.05$) at four weeks follow-up. **Conclusions:** Results suggest that muscle energy technique seems more effective compared to ischemic compression in terms of decreasing pain, upper limb and neck disability and improving shoulder mobility in patients with chronic shoulder pain having myofascial trigger points.

INTRODUCTION

Shoulder pain is prevalent musculoskeletal condition [1]. Multiple physical factors are responsible for causing shoulder pain and disability [2]. Pathophysiological processes for shoulder pain are not clearly understood [3]. Another way to explain pathophysiology underlying shoulder pain is to consider involvement of myofascial trigger points (MTrPs) [4]. MTrPs are prevalent in shoulder muscles and cause discomfort in upper extremity [5]. Treatment methods to inactivate MTrPs in shoulder disorders are not much known [6]. Presence of point tenderness over tight muscle band, local twitch reaction, muscle weakness but no atrophy and referred pain are distinguishing clinical characteristics of MTrPs [7]. Prevalence of trigger points in upper trapezius, supraspinatus and triceps brachii in neck and shoulder disorders is high [8, 9]. Upper trapezius MTrP was quite common in shoulder pain patients, causing pain in temple, rear corner of jaw, down the side of neck behind ear, behind eye [4, 10]. Pain from MTrP in supraspinatus can be felt as a deep ache in outer side of shoulder, as well as upper side of arm and forearm [3, 10, 11]. Although MTrP in latissimus dorsi is frequently neglected as a cause of shoulder pain in

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frontal/lateral regions, it can also produce pain along ulnar nerve distribution and is associated with C3-4-disc lesion [10-13]. Long head of triceps is commonly involved in shoulder dysfunction and refers discomfort to back of shoulder and outer elbow [10, 12]. Treatment of MTrPs in physiotherapy include, Muscle Energy Technique (MET), Ischemic Compression (IC), dry needling, ultrasound therapy and laser therapy [14]. IC as defined by Simons et al., is a type of pressure release therapy that involves gradually increasing painless pressure over a MTrPs until first tissue barrier is reached [10]. This pressure is then maintained for short time to relieve tension in restricted tissues. Before stretching, MET is considered as an effective method to release tension from muscle. This method is based on autogenic inhibition or reciprocal inhibition [15, 16] and evidence supports use of MET in acute and chronic nonspecific neck pain [17]. Previous studies have not compared effectiveness of MET and IC on multiple muscles since these techniques are fast-acting and have a rapid impact on lowering symptoms at MTrPs [18]. Previous studies focused exclusively on upper trapezius MTrPs and was limited to neck pain. Thus, purpose of this study was to compare clinical effects of MET and IC on chronic shoulder pain caused by MTrPs of upper trapezius, supraspinatus, latissimus dorsi, and triceps brachii muscles.

METHODS

This quasi-experimental study was conducted at Physical Therapy Department, DHQ hospital Faisalabad from September 2018 to March 2019. Both male and female patients of age 18-50 years having distinct features of MTrPs were included through convenient sampling. Participants with recent shoulder injury/wound, vascular syndrome, skin disease and those receiving any treatment for myofascial pain were excluded. After taking informed written consent 42 participants were allocated equally into two groups i.e., Group A and Group B. Group A received MET and Group B received IC along with ultrasound as baseline therapy at frequency of 3 MHz, Intensity of 1.4 W/cm2, for 5 minutes at continuous mode. MET was applied by bringing each muscle (supraspinatus, upper trapezius, latissimus dorsi and triceps brachii) to length just short of pain to the stage where resistance was first felt. In IC slowly increasing pressure was applied to all involved muscle and kept for almost 20 seconds to 1 minute with thumb until patient reported decrease in pain. After muscle fibers relaxed under stress, stress was gradually released. Both procedures were repeated 3 to 5 times for 3 sessions per week in four successive weeks. All participants were evaluated by Visual Analogue Scale (VAS), Neck disability Index (NDI), Disabilities of Arm, Shoulder and Hand (DASH) questionnaire and goniometer for measuring pain, disability of neck, shoulder and arm and shoulder range of motion (ROM) respectively at baseline and at 4 weeks follow-up after 12 treatment sessions. Ethical approval was taken from ethical review committee of Riphah College of Rehabilitation & Allied Health Sciences (Ref. No: RCR& AHS/REC/MS-OMPT/004 dated 7th September 2018). A sample size of 19 participants in each group was calculated with power of 80%, 5% margin error, 95% confidence interval and taking mean difference in VAS pain scores between the two groups of 0.7333 [19]. Total 42 participants were recruited in study by assuming 10% attrition rate. Data were analyzed using Windows software SPSS version 20.0. After assessing normality of data by Shapiro-wilk test, independent sample t-test (parametric test) was applied to measure differences between two groups. The significance level α was set to 0.05.

RESULTS

Forty-four participants were assessed for eligibility. Two patients who did not meet inclusion criteria were excluded. One subject was dropped from Group A due to personal problems and one subject from Group B was unable to continue all therapy sessions. Therefore, during final analysis at end of four weeks their information was not included. Age of the participants in MET group was 37.39±10.12 and in IC group was 38.43±10.77. At baseline, Disabilities of arm, shoulder and hand score in MET group was 47.70±9.78 and in IC group was 46.55±12.71. Neck disability index score in MET group was 20.38±8.52 and in IC group was 18.57±10.26 (Table 1).

Variables		Muscle energy technique (n=21) Mean ± SD	Ischemic compression (n=21) Mean ± SD	p-value
Age (year)		37.39±10.12	38.43±10.77	0.748
Height (cm)		163.53 ±7.72	159.17±8.28	0.086
Weight (kg)		65.80±11.02	63.95±10.85	0.585
Body Mass Index		24.54±3.65	25.15±3.76	0.597
Disabilities of arm, shoulder and hand (0-100)		47.70±9.78	46.55±12.71	0.744
Neck disability index (0-50)		20.38±8.52	18.57±10.26	0.538
Visual analogue scale (0-10)		6.76±0.99	6.76±1.17	1.000
Shoulder range of motion (degrees)	Flexion	91.57±8.38	89.86±4.48	0.414
	Extension	39.52±7.05	38.09±6.01	0.484
	Abduction	90.52±7.04	92.04±4.77	0.417
	Internal rotation	46.47±7.68	49.2±7.00	0.223
	External rotation	72.38±11.35	72.38±11.79	1.000

Table 1: Demographic data and baseline characteristics of the participants

Between groups differences at four weeks follow-up reported significant difference in Shoulder range of motion includes flection <0.001, extension<0.001, abduction

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<0.001 adduction <0.001, internal rotation <0.001 and external rotation <0.003, disabilities of arm, shoulder and hand <0.001, and visual analogue scale< 0.004. However no significant difference was found between two groups while comparing Neck disability index with p value < 0.004 (Table 2).

Variables		Muscle energy technique (n=20) Mean±SD	Ischemic compression (n=21) Mean ± SD	Mean difference	p-value
Disabilities of arm, shoulder and hand (0-100)		20.24±5.13	30.51±9.19	10.2	<0.001
Neck disability index (0-50)		8.30±3.8	14.60±9.2	76.30	0.009
Visual analogue scale (0-10)		52.70±0.651	53.50±0.94	0.80	0.004
Shoulder range of motion (degrees)	Flexion	42.75±9.66	107.40±8.14	35.35	<0.001
	Extension	54.65±5.651	43.95±6.12	10.70	<0.001
	Abduction	42.85±9.05	116.25±11.22	26.60	<0.001
	Internal rotation	71.60±8.74	55.20±7.00	16.40	<0.001
	External rotation	83.50±5.87	74.50±10.99	9.00	0.003

Table 2: Between groups differences of DASH, NDI, VAS and Shoulder Movements at 4 weeks follow-up

DISCUSSION

One of the most common causes of neck and shoulder pain is myofascial trigger points (MTrPs) [20]. In patients with chronic shoulder pain who have MTrPs, there has been limited research on manual therapy methods and their effectiveness. Therefore, the current study was designed to determine the effect of MET and IC on MTrPs in chronic shoulder pain patients. In present study, MET increased shoulder ROM in more than IC, these results are in line with the work done previously by Gupta *et al.*, [21]. This is because the phenomenon of viscoelasticity as a consequence of contraction and stretching used in MET leads to a rise in tissue extensibility which reduces rigidity [19, 22]. In this study, MET was more successful in reducing pain than IC, however this is not compatible with the previous study, which concluded that IC was more effective in reducing shoulder pain than MET. This could be because the pain value in the IC group was lower before treatment than in the MET group in the previous study [21]. Pain reduction by MET can be due to inhibitory Golgi tendon reflex, which is stimulated during isometric contraction and leads to reflex muscle relaxation, is responsible for hypoalgesia effects [19]. In current study, there was a significant difference in the post-treatment values of shoulder and arm disability, neck disability, pain, and total shoulder range of motion between the two treatment groups in this study comparing the effectiveness of MET and IC on MTrPs in patients with chronic shoulder pain. Nevertheless, MET showed the greatest improvement in terms of disability, pain, and range of motion. According to the study, pain was reduced, PPT was enhanced, and range of motion was improved in both treatments. Ischemic compression improved PPT more effectively. There was no significant difference in VAS scores between the groups. Ischemic compression technique did not improve CROM as effectively as MET [23]. In current study, MET reduced neck disability more than IC, this is in accordance with studies done previously [19, 24, 25]. A systematic review also agreed upon the beneficial effects of MET on disability reduction [26].

CONCLUSIONS

The current study concluded that clinically MET seems more effective than IC in terms of reducing pain and improving shoulder range of motion and neck and upper limb functions in patients with chronic shoulder pain having MTrPs.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Sergienko S and Kalichman L. Myofascial origin of shoulder pain: a literature review. Journal of bodywork and movement therapies. 2015 Jan; 19(1): 91-101. doi: 10.1016/j.jbmt.2014.05.004.

[2] Mitchell C, Adebajo A, Hay E, Carr A. Shoulder pain: diagnosis and management in primary care. BMJ. 2005 Nov; 331(7525): 1124-8. doi: 10.1136/bmj.331.7525.1124.

[3] Hidalgo-Lozano A, Fernández-de-las-Peñas C, Alonso-Blanco C, Ge H-Y, Arendt-Nielsen L, Arroyo-Morales M. Muscle trigger points and pressure pain hyperalgesia in the shoulder muscles in patients with unilateral shoulder impingement: a blinded, controlled study. Experimental brain research. 2010 May; 202(4): 915-25. doi: 10.1007/s00221-010-2196-4.

[4] Bron C, Dommerholt J, Stegenga B, Wensing M, Oostendorp RA. High prevalence of shoulder girdle muscles with myofascial trigger points in patients with shoulder pain. BMC musculoskeletal disorders. 2011 Dec; 12(1): 139. doi: 10.1186/1471-2474-12-139.

[5] Javed MA, Saleem S, Hassan Raza MK. Management of muscle trigger points causing subacromial pain using dry needling technique - a case report. JPMA The Journal of the Pakistan Medical Association. 2020 Dec; 70(12(a)): 2270-2. doi: 10.47391/JPMA.125.

[6] Bron C, Wensing M, Franssen JL, Oostendorp RA. Treatment of myofascial trigger points in common shoulder disorders by physical therapy: a randomized controlled trial [ISRCTN75722066]. BMC musculoskeletal disorders. 2007 Nov; 8(1): 1-8. doi: 10.1186/1471-2474-8-107.

DOI: https://doi.org/10.54393/pjhs.v3i07.391

[7] Gerwin RD, Shannon S, Hong C-Z, Hubbard D, Gevirtz R. Interrater reliability in myofascial trigger point examination. Pain. 1997 Jan; 69(1-2): 65-73. doi: 10.1016/S0304-3959(96)03248-4.

[8] Ribeiro DC, Belgrave A, Naden A, Fang H, Matthews P, Parshottam S. The prevalence of myofascial trigger points in neck and shoulder-related disorders: a systematic review of the literature. BMC musculoskeletal disorders. 2018 Jul; 19(1): 1-13. doi: 10.1186/s12891-018-2157-9.

[9] Basak T, Pal TK, Sasi MM, Agarwal S. A comparative study on the efficacy of ischemic compression and dry needling with muscle energy technique in patients with upper trapezius myofascial trigger points. International Journal of Health Sciences and Research. 2018 Apr; 8(4): 74-81.

[10] Simons DG. Myofascial pain syndrome due to trigger points. International rehabilitation medicine association. 1987 Nov: 1-39.

[11] Bron C, Franssen J, Wensing M, Oostendorp RA. Interrater reliability of palpation of myofascial trigger points in three shoulder muscles. Journal of Manual & Manipulative Therapy. 2007 Oct; 15(4): 203-15. doi: 10.1179/106698107790819477.

[12] Davies C and Davies A. The trigger point therapy workbook: your self-treatment guide for pain relief. New Harbinger Publications; 2013 Sep.

[13] Hsueh TC, Yu S, Kuan TS, Hong CZ. Association of active myofascial trigger points and cervical disc lesions. Journal of the Formosan Medical Association. 1998 Mar; 97(3): 174-80.

[14] de las Peñas CF, Campo MS, Carnero JF, Page JCM. Manual therapies in myofascial trigger point treatment: a systematic review. Journal of Bodywork and Movement Therapies. 2005 Jan; 9(1): 27-34. doi: 10.1016/j.jbmt.2003.11.001.

[15] Nambi G, Sharma R, Inbasekaran D, Vaghesiya A, Bhatt U. Difference in effect between ischemic compression and muscle energy technique on upper trepezius myofascial trigger points: Comparative study. International Journal of Health & Allied Sciences. 2013 Jan; 2(1): 17-22. doi: 10.4103/2278-344x.110570.

[16] Noor R and Afzal B. Comparative Study of Treatment of Trigger Points Pain with Two Techniques. 1 Muscle Energy Technique Alone 2. Combined Approach. Int Journal of Science and Research. 2016 April; 5(4): 1825-9. doi: 10.21275/v5i4.nov162955.

[17] Sbardella S, La Russa C, Bernetti A, Mangone M, Guarnera A, Pezzi L, et al. Muscle Energy Technique in the Rehabilitative Treatment for Acute and Chronic Non-Specific Neck Pain: A Systematic Review. Healthcare. 2021 Jun; 9(6): 746. doi: 10.3390/healthcare9060746.

[18] Sadria G, Hosseini M, Rezasoltani A, Bagheban AA, Davari A, Seifolahi A. A comparison of the effect of the active release and muscle energy techniques on the latent trigger points of the upper trapezius. Journal of bodywork and movement therapies. 2017 Oct; 21(4): 920-5. doi: 10.1016/j.jbmt.2016.10.005.

[19] Kumar GY, Sneha P, Sivajyothi N. Effectiveness of Muscle energy technique, Ischemic compression and Strain counter strain on Upper Trapezius Trigger Points: A comparative study. International journal of physical education, sports and health. 2015 Jan; 1(3): 22-6.

[20] Kashif M, Tahir S, Ashfaq F, Farooq S, Saeed W. Association of myofascial trigger points in neck and shoulder region with depression, anxiety and stress among university students. Journal of the Pakistan Medical Association. 2021 Nov; 71(9): 2139-42. doi: 10.47391/JPMA.375.

[21] Gupta J, Pimpale S, Gupta M. Comparative Study between the Effects of Muscle Energy Technique and Ischemic Compression on Patients with Chronic Shoulder Pain. Indian journal of physiotherapy and occupational therapy. 2018 July; 12(3): 79. doi: 10.5958/0973-5674.2018.00061.8.

[22] Kashyap R, Iqbal A, Alghadir AH. Controlled intervention to compare the efficacies of manual pressure release and the muscle energy technique for treating mechanical neck pain due to upper trapezius trigger points. Journal of pain research. 2018 Dec; 11: 3151-60. doi: 10.2147/JPR.S172711.

[23] Shah N, Shah N. Comparison of two treatment techniques: Muscle energy technique and Ischemic compression on upper trapezius trigger point in subjects with non-specific neck pain. International Journal of Therapies and Rehabilitation Research. 2015 Oct; 4(5): 260-64. doi: 10.5455/ijtrr.000000100.

[24] Junaid M, Yaqoob I, Shakil Ur Rehman S, Ghous M. Effects of post-isometric relaxation, myofascial trigger point release and routine physical therapy in management of acute mechanical neck pain: a randomized controlled trial. JPMA The Journal of the Pakistan Medical Association. 2020 Oct; 70(10): 1688-92. doi: 10.5455/JPMA.15939.

[25] Gilani MHZ, Obaid S, Tariq M. Comparison between Effectiveness of Ischemic Compression and Muscle Energy Technique in Upper Trapezius Myofascial Trigger Points. Isra Medical Journal. 2018 Jul; 10(4): 230-34.

[26] Thomas E, Cavallaro AR, Mani D, Bianco A, Palma A. The efficacy of muscle energy techniques in symptomatic and asymptomatic subjects: a systematic review. Chiropractic & manual therapies. 2019 Aug; 27(1): 35. doi: 10.1186/s12998-019-0258-7.