COMPARISON OF EFFECTIVENESS OF ISCHEMIC COMPRESSION AND PASSIVE STRETCHING FOR TREATMENT OF MYOFASCIAL TRIGGER POINT IN UPPER TRAPEZIUS MUSCLE AMONG DISTRICT JAIL SURVIVORS FAISALABAD

Sidra Manzoor[1], Summaiyah Obaid[2], Farjad Afzal[1], Raheela Kousar[1],Aroosa Azhar[1], Mehal Hamna Zahra Gilani[1]

[1] Riphah International University Lahore Campus
[2] Riphah International University Faisalabad Campus

Address for Correspondence:
Sidra Manzoor
Email: sidramanzoor76@gmail.com

Objective: To determine the effectiveness of Ischemic Compression and Passive Stretching for the treatment of Myofascial trigger point in the Upper Trapezius muscle.

Methods: Fifty eight volunteers, all women jail survivor, participated in this study .Subjects did vocational work on daily basis. Subjects were healthy individuals, diagnosed with active Myofascial trigger point in the upper trapezius muscle following palpation criteria given by Travell & Simons. Subjects were randomly placed into two groups: G1, which received Ischemic compression treatment for Myofascial trigger point; G2 received Passive Stretching treatment for Myofascial trigger point .Treatment was given in one session to both groups. The following data was recorded three times; baseline data, after five minute of intervention and after one week of intervention: active range of motion of cervical measured with Goniometer, pressure tolerance of Myofascial trigger point measured with Visual analogue scale and ADLs limitation was measured by using Neck Disability index.

Results: Results show that ischemic compression and passive stretching both have significant difference in pain reduction. For neck disability index both interventions have similar effects. Test statistics showed that both groups show increase in ROM after intervention.

Key Indexing Terms: Myofascial pain syndrome, Myofascial trigger points, Ischemic Compression, Passive stretching.

INTRODUCTION

The characteristics of MTrP are hyperirritable spot in skeletal muscle which is represented as hypersensitive nodule in taut band when palpated, producing specific pattern of referred pain, impairment in motor function, ROM restriction and restriction in blood flow responses (1). MTrP have been identified to be involved in not only the local mechanical cervical pain to a large extent but also accompany defined patterns of referring pain and symptoms (2). There are two categories of MTrPs; Active and Latent trigger point. Latent and active trigger points produce pain on direct compression but only active MTrP presents spontaneous resting pain and at movement and latent don't. (3). Production of inflammatory substances e.g. substance-P, neuropeptides, cytokines, and calcitonin gene-related peptide (CGRP), IL-1a and bradykinin cause production of local acidity lead to pain production (4). Identification of MTrPs totally depends upon clinical history and physical examination.(5). Ischemic compression (IC) is a safe and effective technique in which digital pressure is applied forcefully to the MTrP to reduce tenderness and pain (6). Temporarily intentional reduction in the flow of blood in the area of MTrP increases local blood flow afterwards, is the basic purpose of IC leading to removal of waste products, increasing the local supply of O_2 and allowing the influenced tissue to heal (7). It is suggested that thumb pressure to release trigger point in ischemic compression should strong enough to cause the skin to blench (6). A pilot study showed improvement in pain pressure threshold and decrease in VAS scores in response to transverse friction massage and ischemic compression maneuver. Pain relief from Ischemic compression has been linked with altered spinal reflex mechanism, resulting in decreased muscle spasm (9). Another study conducted on patients with mechanical neck pain due to trigger points showed that IC is more effective in comparison to ultrasound and trigger point pressure release. (8).

A systematic review on trigger point management showed strong evidences supporting effectiveness of IC for quick pain relief however limited evidence was found to prove effectiveness of IC in long-term. (10).

Continuous stretch eases the tissue fibers beyond securing tissue fiber guarding. Simons and co-workers suggest use of STR with other desensitization modality. STR was found to provide some benefits in MTrP treatment as a home planning for very long period. (11).

Objective of study was to compare the single session efficacy of Ischemic compression and passive stretching for treatment of Myofascial trigger point.

METHODOLOGY

Design of study was randomized control trial. Experimental and control groups were made in order to study two interventions. Lottery method was used for randomization. Experimental group: This group received Ischemic compression therapy. Control group: passive stretching intervention technique was given to the Patient. The population of study was women survivors of Faisalabad District Jail. Data collection was done within 4 to 5 weeks. 56 women jail survivors of district jail Faisalabad participated in the study and

then randomly allocated to experimental and control group. Out of fifty six, two women get bailed from jail after initial assessment session. Remaining 54 participants were divided in each group with equal ratio. At the end data collection was completed from 27 patients in both groups. Female Age 20 to 55 years, with Active MTrP in upper trapezius bilaterally , Referred pain pattern, Jump sign when pressure applied to TrPs ,Pain on contraction of upper trapezius muscle, ipsilateral or bilateral neck tightness , limited ROM of neck in all plane were included in the study. Participants with similar pain pattern due to any other reason not related to MTrPs, history of Cervical trauma (whiplash injury), Advanced progressive cervical osteoporosis, Cervical myeloma, CRPS, Systemic or local infections, Thoracic outlet syndrome, Cervical myelopathy and Patient using analgesic drugs were excluded

All participants were screened by using self-developed screening questionnaire; Diagnosis of Upper trapezius trigger was done by flat and pincer palpation. VAS used to record pre and post intervention pain level in both groups. NDI was used to identify pre and post intervention percentage of disability level in both groups. Outcome tool used to measure degree of limitation in neck movements pre and post intervention in both groups was Goniometer.

RESULTS

Within group changes:

Group I (passive stretching)

	VAS	NDI						NECK ROM (PASSIVE STRETCHING)					
		PAIN INTENSITY	LIFTING	READING	HEADACHE	CONCENTRATION	NDI INDEX %	FLEXION	EXTENSION	R-SIDE FLEXION	L-SIDE FLEXION	R-ROTAION	L-ROTATION
Base line	7.56	3.11	2.93	3.41	3.81	3.56	66.67	53.89	38.37	34	32.85	49.96	50.63
After 01 week	4.37	1.33	1.74	1.63	1.59	1.85	32.81	55.67	52.48	40.81	40.37	63.26	61.96

GROUP 2 (ischemic compression)

	VAS	NDI						NECK ROM (ISCHEMIC COMPRESSION)					
		PAIN INTENSITY	LIFTING	READING	HEADACHE	CONCENTRATION	NDI INDEX %	FLEXION	EXTENSION	R-SIDE FLEXION	L-SIDE FLEXION	R-ROTAION	L-ROTATION
Base line	7.30	3.00	2.59	3.15	4.03	3.11	63.56	54.70	57.37	33.1111	31.81	55.41	53.52
After 01 week	3.78	1.52	1.56	1.60	2.12	1.63	33.63	56.00	53.37	38.26	37.44	66.67	65.37

Paired sample t test (passive stretching, group 1)

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAS - VAS.1	3.185	1.302	.251	2.670	3.700	12.712	26	.000
Pair 2	NDI-NDI 1	33.852	8.132	1.565	30.635	37.069	21.630	26	.000

VAS= BASELINE, VAS1 =AFTER 01 WEEK,
NDI=BASELINE, NDI1 =AFTER 01 WEEK,
Paired sample test was use to compare the data within groups. Test statistics (0.000) is showing effectiveness.

PAIRED SAPMLE T TEST (ISCHEMIC PRESSURE, GROUP 2)

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAS - VAS.1	3.51852	1.67264	.32190	2.85684	4.18019	10.930	26	.000
Pair 2	NDI-NDI 1	29.92593	7.22137	1.38975	27.06925	32.78260	21.533	26	.000

VAS= BASELINE, VAS1= AFTER 01 WEEK,
NDI=BASELINE, NDI1 =AFTER 01 WEEK

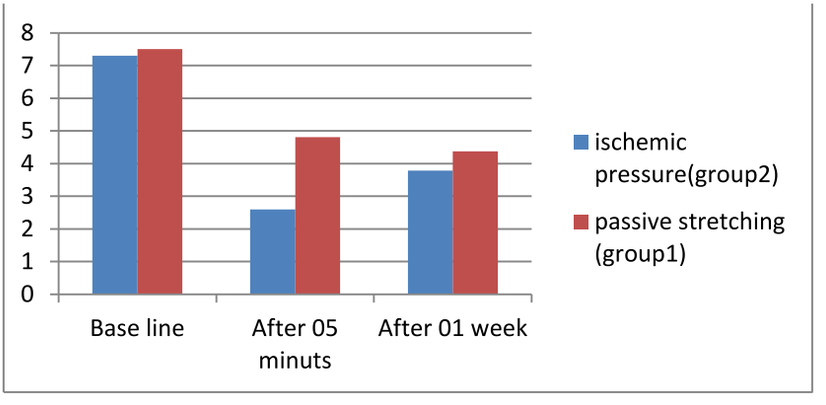
Test statistics 0.000 showed treatment is effective. Both treatments can change the pain and disability in patients.

Between group changes:

Independent T- test was used to compare changes between the groups.

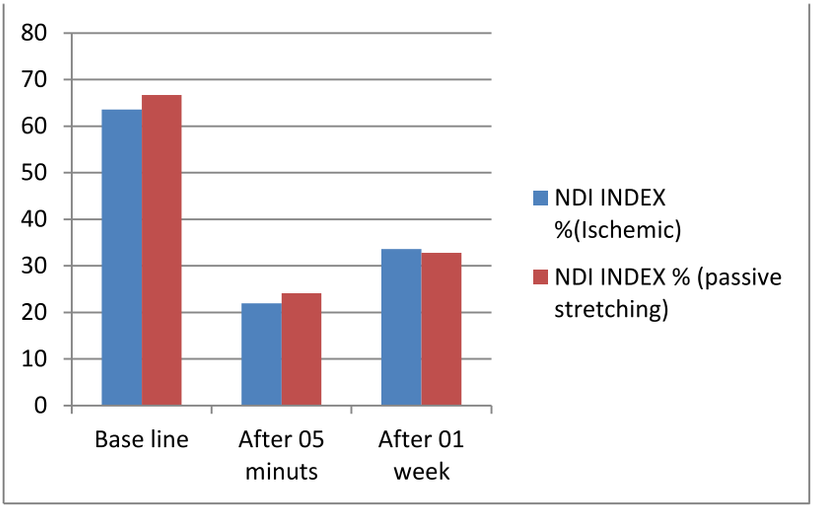
VAS (ISCHEMIC Vs STRETCHING)

VAS	ischemic pressure(group2)	passive stretching (group1)
Base line	7.30	7.56
After 01 week	3.78	4.37



NDI (NECK DISABILITY INDEX) ISCHEMIC Vs STRETCHING

	NDI INDEX %(Ischemic)	NDI INDEX % (passive stretching)
Base line	63.56	66.67
After 01 week	33.63	32.81



T-INDEPENDENT TEST FOR VAS

Group Statistics					
	Treatment Type	N	Mean	Std. Deviation	Std. Error Mean
Baseline VAS Measurement	passive stretching	27	7.56	.974	.187
	ischemic compression	27	7.30	.993	.191
After 05 minutes VAS Measurements	passive stretching	27	4.81	1.241	.239
	ischemic compression	27	2.59	1.118	.215
After 01 Week VAS Measurements	passive stretching	27	4.37	1.471	.283
	ischemic compression	27	3.78	1.450	.279

T-independent test was used to compare the data between the groups. 05 minutes showing the short term effectiveness and 01 week showing midterm effectiveness. Significant level was 0.05. **Test statistics (0.337)** at baseline is showing both the groups are similar and there is no difference between the groups and both treatments can reduce pain effectively.
Test statistics (0.000) is showing the significant short term effectiveness between the groups and there is difference in pain reduction in short term effectiveness.

DISCUSSION

Myofascial trigger point is a common musculoskeletal condition that is developed by repetitive loading of muscle. The assumption is that single session of IC and passive stretching are effective to reduce pain level and to improve neck ROM. Result of present study demonstrate that IC and passive stretching both are effective treatment for Myofascial trigger point but IC is more effective in short term relief while passive stretching is more effective to sustain decrease in pain, functional disability and increase in ROM.

A clinical trial with no blinding was performed to check the instant effect of IC and ultrasound. Sixty six volunteer was recruited, all from CEU-Cardenal Herrera University personnel all subjects were healthy, diagnosed latent MTrPs of upper trapezius. Outcome measure was taken by algometer, NRS, VAS and CROM. Results suggest that both treatment show marked decrease in basal electrical activity of muscle .in addition to this single application of ischemic compression produce short term positive effect in term of increase in ROM ,pain reduction and myofascial trigger point sensitivity in MTrPs of upper trapezius (7).

To investigate pressure pain sensitivity and effectiveness of different manual techniques on cervical ROM in patients having latent MTrP of the superior trapezius tissue fibers 117 participants were haphazardly spilt into

five classes, having unilateral latent TP on superior trapezius because of working on computer: ischemic pressure class in which number of subject is 24; stretching applied passively class in which number of subject is 23; muscle energy method class in which number of subject is 23; and placebo class in which number of subject is 22 & two classes in which treatment is not applied, number of subject is 25. A cervical ROM instrument algometer also with pressure ache threshold through a VAS were used to measure cervical spine ROM. Outcomes were measured immediately pre-treatment and next to twenty four hours of treatment and after follow up of one week. Researcher was unsighted. For 3 experimental groups the immediate effect sizes were large for opposite side flexion, same side rotation, and pressure ache sensitivity. However, next to twenty four hours & one week, just ischemic pressure class maintained the result magnitude. Methods applied by hand on the superior trapezius with hidden TrP increased neck ROM & the pressure ach threshold (3).

LIMITATION

There were limited resources for assessment of presence of Myofascial trigger points e.g. unavailability of equipment like cervical inclinometer and algometry for pain pressure threshold measurement which may be used for better assessment of range of motion

Short time duration and short sample size were also limitations of study. The study could be more appropriate and extensive if there was easy availability of all resources, equipment and the results could be more significant if it would be applied on a large sample size.

REFERENCES

1. O'Leary S, Falla D, Elliott JM, Jull G. Muscle dysfunction in cervical spine pain: implications for assessment and management. The Journal of orthopaedic and sports physical therapy. 2009;39(5):324-33.

2. Dommerholt J, Hooks T, Grieve R, Layton M. A critical overview of the current myofascial pain literature - July 2015. Journal of bodywork and movement therapies. 2015;19(3):482-93.

3. Oliveira-Campelo NM, de Melo CA, Alburquerque-Sendin F, Machado JP. Short- and medium-term effects of manual therapy on cervical active range of motion and pressure pain sensitivity in latent myofascial pain of the upper trapezius muscle: a randomized controlled trial. Journal of manipulative and physiological therapeutics. 2013;36(5):300-9.

4. Gerwin RD. Myofascial Pain Syndrome. Pain and Rehabilitation Medicine. 2010:70.

5. Giamberardino MA, Affaitati G, Fabrizio A, Costantini R. Myofascial pain syndromes and their evaluation. Best practice & research Clinical rheumatology. 2011;25(2):185-98.

6. Simons D, Travell J. Myofascial origins of low back pain. 1. Principles of diagnosis and treatment. Postgraduate medicine. 1983;73(2):66, 8-70, 3 passim.

7. Montañez-Aguilera FJ, Valtueña-Gimeno N, Pecos-Martín D, Arnau-Masanet R, Barrios-Pitarque C, Bosch-Morell F. Changes in a patient with neck pain after application of ischemic compression as a trigger point therapy. Journal of back and musculoskeletal rehabilitation. 2010;23(2):101-4. 2008;11(4):175-81.

8. Gemmell H, Miller P, Nordstrom H. Immediate effect of ischaemic compression and trigger point pressure release on neck pain and upper trapezius trigger points: A randomised controlled trial. Clinical Chiropractic. 2008;11(1):30-6.

9. Dimitrios Kostopoulos AJN, Reuben S. Ingber, and Ralph W. Larkin. Reduction of Spontaneous Electrical Activity and Pain Perception of Trigger Points in the Upper Trapezius Muscle through Trigger Point Compression and Passive StretchingJournal of Musculoskeletal Pain. 2008;16(4):266-78.

10. Vernon H, Schneider M. Chiropractic management of myofascial trigger points and myofascial pain syndrome: a systematic review of the literature. Journal of manipulative and physiological therapeutics. 2009;32(1):14-24.

11. Somprasong S, Mekhora K, Vachalathiti R, Pichaiyongwongdee S. Effects of strain counter-strain and stretching techniques in active myofascial pain syndrome. Journal of Physical Therapy Science. 2011;23(6):889-93.