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COMPARATIVE EFFECT OF COUNTER STRAIN TECHNIQUE AND POST ISOMETRIC RELAXATION TECHNIQUE ON PAIN, FATIGUE AND FUNCTIONAL DISABILITY IN THORACIC MYOFASCIAL PAIN SYNDROME

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ABSTRACT

Introduction: Thoracic Myofascial Pain Syndrome is a localized musculoskeletal pain condition characterized by the presence of myofascial trigger points in the thoracic region. Conventional therapies are widely used for its management; however, this study aimed to compare the effectiveness of two manual therapy techniques: strain-counterstrain and post-isometric relaxation.

Materials and Methodology: An experimental study was conducted on 30 patients diagnosed with thoracic myofascial pain syndrome using a convenient sampling technique. Participants were randomly assigned into two groups (n=15 each) using a computer-generated random number method. Group A received the strain counterstrain technique in combination with a hot pack and massage gun, while Group B received post-isometric relaxation technique along with a hot pack and massage gun. Outcome measures included the Visual Analogue Scale for pain, Modified Pain Disability Questionnaire for functional disability, and Fatigue Severity Scale for fatigue assessment. Data were analyzed using SPSS version 27.

Conclusion: The study found that both interventions were effective in

reducing pain, fatigue, and functional disability in patients with thoracic myofascial pain syndrome. However, the strain-counterstrain technique demonstrated significantly greater improvements across all outcome measures compared to the post-isometric relaxation technique. Thus, Strain counterstrain technique may be considered a more effective approach for the management of thoracic myofascial pain syndrome when used alongside standard modalities such as heat therapy and massage.

INTRODUCTION:

Myofascial Pain Syndrome is a disorder characterized by a constellation of sensory, motor, and autonomic symptoms primarily caused by muscle stiffness. This Stiffness arises from hypersensitive myofascial trigger points and fascial constrictions in muscle fibers.[1]

Myofascial pain syndrome involves hyperirritable nodules within taut muscle bands, causing pain and discomfort, either spontaneously or through mechanical triggers. Trigger points are classified as latent, causing stiffness and limited movement, or active, leading to chronic pain even at rest. [2].

Myofascial pain syndrome in the trapezius and rhomboid muscles causes stiffness, tenderness, and limited motion, significantly impacting quality of life. [3]. Myofascial pain may affect up to eighty-five percent of the general population, with differences observed between males and females. Several sources also indicate a higher prevalence among women.[4].

The thoracic region acts as a key connection point between the neck and lower back, essential for posture, upper body support, and spinal cord protection. Restricted thoracic spine mobility can cause compensatory movements in the lumbar spine, contributing to lower back pain and fatigue. It may also affect the neck and shoulders. the thoracic spine contributes to 33% of neck flexion and 21% of rotation, its stiffness can lead to neck discomfort.[5].

The "Trigger Point Manual" by Travell and Simons is the standard for diagnosing myofascial trigger points using five primary and three secondary criteria. Secondary indicators include pain or unusual sensation upon pressure, a local twitch response when the muscle is snapped or needled, and pain relief after stretching or injection.[1] .The five primary criteria for identifying a trigger point include localized unexplained pain, referred sensations, a taut palpable band, spot tenderness, and restricted range of motion. Diagnosis is confirmed when at least four major and one minor criterion are met. [6]

Palpation of the taut band is done by flat palpation method which allows examination of muscles reachable from just one side. It involves gently pushing the skin sideways with the index finger, then sliding the fingertip over the muscle to feel any taut bands beneath, while using the opposite finger on the other side. When applied with more force on the taut band, this technique is referred to as snapping palpation.[7]

The Strain Counterstain technique, also known as Positional Release Technique, is a gentle, passive manual therapy designed to reduce musculoskeletal pain and dysfunction. It works indirectly by positioning the body to relieve tension and discomfort. This method is widely used and rank as the fourth most popular osteopathic treatment. It is commonly employed in orthopedic practice to address issues such as pain, localized swelling, and tightness in the fascia. It also helps improve joint stiffness, correct muscle imbalances, and reduce spasms and weakness.[8]

Strain-Counterstain works by positioning the affected muscle in a shortened state, which helps reset muscle spindle

activity and normalize muscle tone and length. This technique may alleviate pain by correcting the imbalance between intrafusal and extrafusal fibers and restoring proper proprioceptive function. Also, it enhances local blood flow by allowing unopposed arterial perfusion, which reduces tissue tension, promotes relaxation and improves circulation. These physiological changes contribute to restoring normal muscle length, increasing flexibility, relieving pain, and improving overall movement and function.[9]

Post-Isometric Relaxation is a therapeutic approach within Muscle Energy Techniques used to relax and elongate muscles that are overly tense or shortened. It involves an isometric contraction followed by a passive stretch. This method helps improve flexibility and reduce muscle tightness. [10]. Also, post-isometric relaxation is based on the concept of autogenic inhibition, where overstretching a muscle triggers the Golgi tendon organ to inhibit further contraction. This serves as a protective response to prevent muscle damage.[11]

Post-isometric relaxation involves several neurological and biomechanical effects, such as reduced pain sensitivity, modified proprioceptive input, adjustments in motor control and coordination, and shifts in tissue fluid dynamics [12]. Also, rhythmic muscle contractions enhance lymphatic and blood circulation, while mechanical stress on fibroblasts boosts capillary blood flow and alters connective tissue. Muscle energy technique may also reduce peripheral nociceptor sensitivity and decrease pro-inflammatory cytokine levels. [13]

Material and methodology:

A quasi-experimental study was conducted on 30 patients diagnosed with thoracic myofascial pain syndrome. These patients were selected in Government College University Faisalabad through convient sampling technique. Duration of study 3 months after approval of synopsis.

Participants included in the study were males and females between the ages of 20 to 40 years. Participants who had active or latent myofascial trigger points in the thoracic region,tenderness in the scapular and shoulder region,pain rating greater than 3 on visual analogue scale,minimum pain duration of three months,fatigue severity scale score is 4 or higher and a presence of generalized pain were all included in the study. Also Jump sign (on pressure applied on trigger point the patient may wince, cry or jump) and palpation techniques was used for the confirmation of trigger point.

Participants who had a history of cervical radiculopathy, myelopathy, malignancy, spondylosis, fibromyalgia, any traumatic or neuropathic spinal disease and with open wounds were also excluded. Furthermore, those with mental or psychotic disorders or any skin diseases were not eligible to participate in the study.

The consent was taken from the participants before inclusion in the study. Then the patients were allocated into two groups. Group A was receiving strain counter-strain technique with hot pack and massage gun as a baseline and Group B was receive post isometric relaxation technique with hot pack and massage gun (baseline). The sessions were taken on 3 times a week on alternative days and the total time of session was 25-30 minutes for both groups. The total span of this exercise regime was 3 weeks for both groups. As for the baseline therapies hotpack used to relaxed the stiffened muscle and applied for five minutes before the intervention and massage gun increased the blood flow and releases muscle tension and also applied for five minutes prior to intervention.

Group A was received Strain-Counter Strain technique performed by palpating a Trigger Point in the rhomboids and trapezius

then by using pain scale measure the soreness. Place the patient in a supine position that causes the least discomfort at trigger point while remaining passive and gentle. First, make an approximate estimate of the position and then adjust was tiny movement arcs. Try to improve tenderness at least 70% by palpating the trigger point. Hold this posture for 90 seconds while observing the patient and Trigger point. Brought back the patient to the neutral position passively. Then again check for the tenderness of the trigger point.

Group B participants was received post isometric relaxation technique the therapist asked the participant to abduct the shoulder to 90° and flex the elbow to 90° in sitting position. The therapist passively moves the participants arm forward to the limiting barrier; once reached, he places one hand on the medial edge of the treatment side and the other hand behind the subject's elbow. The participant was be asked to push the therapist's hand back with the elbow at approximately 30% strength and hold for 7 seconds. The participant was asked to relax for 5 seconds before stretching again. Finally, the therapist painlessly moves the subject's arm to the new limiting barrier (and slightly beyond) and holds it in this position for at least 45 seconds. Repeat 3 to 5 times.

Results:

TABLE 1: Descriptive statistics of demographics

variables	Means	Std. dev	Min.	Max.
Age group A	27.40	5.13	20	38
Age group B	27.13	5.792	20	39
Gender group A	1.67	0.488	1	2
Gender group B	1.47	0.516	1	2

TABLE 1: Descriptive statistics of demographics

This table showed descriptive statistics of dependent variables in the research .The mean age of participants in group A is 27.40 with standard deviation 5.1,Minimum age in this group is 20 and maximum age is 38.While the mean age in group B is 27.13 with standard deviation 5.792. Minimum age in this group is 20 and maximum age is 39.However mean value of gender is 1.67 in group A and mean value of gender is 1.47 in group B .In this descriptive table value 1 showed males and value 2 showed females .

TABLE 2:Paired T test (within group analysis)

	Group A (strain counter strain)		Group B(Post-isometric relaxation technique)	
	Mean±St.dev	P value	Mean±St.Dev	P value
VAS				
Pre value	2.67±0.488	<0.001	2.47±0.516	<0.001
Post value	0.80±0.561		1.73±0.458	
FDQ				
Pre value	3.31±0.640	<0.001	3.07±0.799	<0.004
Post value	1.80±0.775		2.60±0.632	
FSS				

Pre value	4.73±0.704	<0.001	4.00±1.00	<0.001
Post value	1.67±0.488		2.20±0.561	

TABLE 2: Within group analysis (Paired T test)

This table demonstrates that within group analysis with the help of paired t test applied on visual analogue scale , functional disability scale and fatigue sverity scale of both group A and Group B.If we compare the mean and standard deviation of pre and post values. It shows that value of mean is greater than st. dv. Reduced value of mean and standard deviation showed that the exercise applied on group A and group B is significantly effective as p value for VAS is 0.001, for FDQ is 0.001 and for FSS is 0.001 which is less than 0.05 in group A .And for group B p value for VAS is 0.001 , for FDQ is 0.004 and for FSS is 0.001 which is also less than 0.05.But mean value showed that exercise applied on group A gives better results than Group B

TABLE 3:Independent t test(Between group analysis)

Variables	Groups	Values	Mean±St.Dev	P value
Visual analouge scale	Group A	Pre values	2.67±0.488	0.285
	Group B	Pre values	2.47±0.516	
	Group A	Post values	0.80±0.561	<0.001
	Group B	Post values	1.73±0.458	
Functional disability scale	Group A	Pre values	3.31±0.640	0.803
	Group B	Pre values	3.07±0.799	
	Group A	Post values	1.80±0.775	0.002
	Group B	Post values	2.60±0.632	
Fatigue severity scale	Group A	Pre values	4.73±0.704	0.028
	Group B	Pre values	4.00±1.00	
	Group A	Post values	1.67±0.488	0.010
	Group B	Post values	2.20±0.561	

TABLE 3: Independent T test

This table illustrates the between group analysis with the help of independent t test applied on visual analouge scale , functional disability scale and fatigue severity scale pre and post values for group A and group B . The difference between mean and standard deviation of pre and post values of all three scales showed that group A had better results than group B, the p value is 0.001 for VAS , 0.002 for FDQ and 0.010 for FSS which is less than 0.05 which indicate the result are significant and mean values showed that group A give better results than group B.

Disscussion:

This study was conducted to compare the effects of strain counterstrain and postisometric relaxation techniques on thoracic myofascial pain syndrome. Findings indicated that both methods significantly reduced pain, fatigue, and functional disability; however,the strain counters-strain technique demonstrated a slightly greater therapeutic benefit

In 2025 Annisa conducted a study in Bukittinggi assessed the effect of Strain Counterstain on neck functional activity in tailors with work-related neck pain. Eight participants were included and placed in a single intervention group that received Strain counterstrain therapy. Before the intervention, the average neck functional activity score was 27.38%, indicating moderate disability. After two weeks of Strain counterstrain treatment, the score improved to 21%, reflecting a 6.38% reduction in disability. The Signed-rank comparison method was used for statistical analysis and Presented a significant p-value of 0.012. The findings indicate that Strain counterstrain is Beneficial for enhancing neck function and reducing disability in individuals performing repetitive tasks like tailoring

In 2021, Javeria Ahmed conducted a randomized controlled trial comparing Strain Counterstrain with conventional physical therapy for mechanical low back pain. Forty participants twenty two females and eighteen males were divided into two groups receiving treatment over two weeks, four sessions per week. Assessments included lumbar range of motion, manual muscle testing, Numerical Pain Score, and Modified Oswestry Disability 52 Questionnaire. The Wilcoxon matched-pairs test showed significant pain, mobility, and strength improvements within groups. Mann–Whitney U test indicated greater gains in lumbar flexion and left side bending for the SCS group with very high significant value. Paired ttest revealed reduced disability scores, and independent t-test confirmed better functional outcomes in the SCS group. The study concluded strain counter strain effectively improves mobility and function, matching conventional therapy's benefits for long term low back pain.

In 2021, Tubassam carried out a study to compare the productivity of muscle Energy Technique and Strain Counter-strain for treating hyperirritable points in the Quadratus Lumborum muscles among patients with lumbago. Forty participants were randomly assigned to two groups: Group A received MET combined with moist heat, while Group B was treated with SCS and moist heat. Both groups underwent therapy for two weeks. Pain and disability were measured using the Numeric Pain Rating Scale and the Modified Oswestry Disability Questionnaire. Initial disability scores were 7.35 for Group A and 7.89 for Group B, improving to 5.87 and 7.87, respectively. Pain scores decreased from 1.25 to 1.16 in Group A and from 1.26 to 1.20 in Group B. The findings demonstrated that both treatments effectively reduced pain and disability, with muscle energy technique proving to be more clinically beneficial than strain counter strain.

Conclusion:

It was concluded that paired T test showed that the both strain counter-strain technique and post isometric relaxation technique are effective and give statistically significant results. But Independent T test showed that the strain counter-strain technique had much more effect and clinically give better results on pain, fatigue and functional disability than post isometric relaxation technique

References:

1. Urits, I., et al., *Treatment and management of myofascial pain syndrome.* Best Practice & Research Clinical Anaesthesiology, 2020. **34**(3): p. 427-448.
2. Azad, M.A.K., et al., *Prevalence and Management of Myofascial Pain Syndrome among Patients with Chronic Pain.*
3. Gálvez, L.A., et al., *Trapezius-rhomboid plane block for myofascial pain syndrome. Description of a new intervention.* Interventional Pain Medicine, 2024. **3**(2): p. 100410.
4. Lam, C., et al., *Myofascial pain–A major player in musculoskeletal pain.*

Best Practice & Research Clinical Rheumatology, 2024: p. 101944.

5. Sivakumar, V., *EFFECTIVENESS OF THORACIC MOBILITY EXERCISE VERSUS MANUAL RELEASE TECHNIQUE IN MINIMIZING MECHANICAL UPPER BACK PAIN (UBP) AMONG UNDERGRADUATES IN SRI LANKA*. 2024, Bangladesh Health Professions Institute, Faculty of Medicine, the University ….

6. Duarte, F.C., et al., *Re-examining myofascial pain syndrome: Toward biomarker development and mechanism-based diagnostic criteria.* Current rheumatology reports, 2021. **23**: p. 1-10.

7. Kumar, A., et al., *Myofascial Pain Syndrome: A Comprehensive Systematic Literature Review on Diagnostic Approaches, Treatment Modalities and Recent Advances.* Indian Journal of Physical Medicine & Rehabilitation, 2025. **35**(2): p. 59-70.

8. Ammara, U., et al., *Comparative Effects of Positional Release Technique Vs Deep Transverse Friction Massage on Pain and Disability.* Pakistan Journal of Medical & Health Sciences, 2023. **17**(04): p. 200-200.

9. Bhatnagar, G., et al., *Effectiveness of Met and Strain-Counterstrain in Treating Acute Myofascial Upper Trapezius Trigger Points in Patients with Mechanical Neck Pain-A Comparative Study.* Int J Cur Res Rev| Vol, 2021. **13**(24): p. 46.

10. Mulla, N.M., P. Kulkarni, and A. Kumar, *Immediate effect of strain counterstrain technique versus muscle energy technique on upper trapezius tenderness in non-specific neck pain.* Int J Sci Healthc Res, 2021. **6**(2): p. 289-298.

11. Balaji, T. and V. Ramalingam, *Comparing the effects of post-isometric relaxation and hold-relax technique for cervicogenic headache among computer users.* Neurology Asia, 2025. **30**(1).

12. Albaker, A., *Ischemic pressure vs. post-isometric relaxation for treatment of rhomboid latent myofascial trigger point: a systemic review.* European Review for Medical & Pharmacological Sciences, 2023. **27**(11).

13. Khan, Z.K., et al., *Effect of post-isometric relaxation versus myofascial release therapy on pain, functional disability, rom and qol in the management of non-specific neck pain: a randomized controlled trial.* BMC Musculoskeletal Disorders, 2022. **23**(1): p. 567.