

Effect of Positional Release Technique versus Muscle Energy Technique on Pressure Pain Threshold and Muscle Activity among Young Adults with Upper Trapezius Myalgia

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ABSTRACT: Mechanical neck pain is a prevalent condition, affecting around 45–54% of the general population, particularly after maintaining prolonged sitting postures, and may sometimes lead to Upper Trapezius Myalgia. Muscle Energy Technique (MET) is commonly used to reduce muscle tension before stretching by introducing an isometric contraction to the affected muscle, promoting post-isometric relaxation. Similarly, Positional Release Therapy (PRT) is a manual therapy aimed at restoring muscles to their normal resting tone. This study was designed to compare the effects of MET and PRT on pain and functional outcomes in patients with Upper Trapezius Myalgia. Ethical approval was obtained from the Institutional Ethical Committee prior to commencement. Patients presenting with neck pain were screened, and 30 subjects aged between 20 and 50 years, both male and female, meeting the inclusion and exclusion criteria, were enrolled and randomly assigned to two groups: Group A received MET and Group B received PRT. Pain intensity and functional disability were assessed before and after treatment using the Numerical Pain Rating Scale (NPRS) and the Neck Disability Index (NDI). The results indicated that both groups showed significant improvements in pain relief and neck mobility, with a p-value of 0.000, demonstrating statistical significance. However, the study concluded that Muscle Energy Technique (MET) was clinically more effective than Positional Release Therapy (PRT) in improving pain and function in individuals with Upper Trapezius Myalgia associated with non-specific neck pain.

Keywords: MET, PRT, Upper Trapezius Myalgia, Pressure Pain, NPRS.

INTRODUCTION

Neck pain is a common musculoskeletal complaint arising from both traumatic and non-traumatic causes. It is estimated that nearly two-thirds of the general population will experience neck pain at some point, with the highest prevalence seen during middle age (Cagnie *et al.*, 2007). Upper Trapezius Myalgia refers to inflammation affecting the upper, middle, and lower fibers of the trapezius muscle. This large, diamond-shaped muscle comprises three distinct parts and forms the slope of the shoulder, originating from the base of the skull and extending from the C7 to T2 vertebrae, with insertions at the outer third of the clavicle, the acromion, and the spine of the scapula (Williams *et al.*, 2010). Its innervation is provided by the accessory nerve and cervical nerve roots C1 to C4 (Cleland *et al.*, 2008). Most individuals experiencing neck or shoulder discomfort often localize their pain to the slope between the base of the neck and the shoulder, corresponding to

the upper trapezius region (Prasana *et al.*, 2023). Common symptoms accompanying upper trapezius pain include headaches, dizziness, mid-back discomfort, and restricted neck mobility, with pain exacerbated by physical activity and sometimes referring to adjacent areas (Tousignant *et al.*, 2000). Passive movement often provokes pain and is restricted due to protective muscle spasms (Chaitow, 2006). Recent theories suggest that the pathophysiology of Upper Trapezius Myalgia involves repetitive overload and microtrauma leading to localized muscle fiber contraction, diminished oxygen and glucose supply, and the accumulation of metabolic waste, culminating in the formation of trigger points. Muscle Energy Technique (MET) has been advocated for managing such conditions by reducing pain, stretching tight muscles and fascia, normalizing muscle tone, enhancing local blood flow, strengthening weakened muscles, and mobilizing joint restrictions (D'Ambrogio and Roth 1997). As described by Leon Chaitow, the action of

Positional Release Therapy (PRT) is explained through the proprioceptive theory, which attributes changes to altered muscle spindle activity and autonomic influences, reducing neuromuscular dysfunction and local inflammation (Dutton, 2008). MET typically employs an isometric contraction against therapist resistance to achieve post-isometric relaxation, facilitating a subsequent stretch of the muscle (El-Metwally *et al.*, 2007). Conversely, PRT, also referred to as strain-counterstrain, involves identifying tender points within the trapezius, applying mild pressure to elicit a nociceptive response, and positioning the body to minimize tension and discomfort in the muscle, promoting a reduction in muscle tone. MET, initially developed to address joint hypomobility, utilizes specific patient positioning to engage movement barriers, with controlled isometric contractions against resistance leading to improved spinal and joint function without forceful manipulation (Jones, 1995). This method is particularly beneficial for individuals whose symptoms are exacerbated by sustained postures (Manisha Rathi and Kiran Jeswani 2023). Each MET session typically begins and concludes with movement assessments to monitor treatment effects. PRT, by contrast, restores normal muscle tone by positioning hypertonic muscles in shortened states, inhibiting muscle spindle activity, reducing protective neuromuscular responses, and allowing muscles to return to a relaxed state (Miller, 2008). Once optimal tissue relaxation is achieved, patients are carefully moved back to a neutral posture to prevent reactivation of the muscle spindle reflex (Nagrle *et al.*, 2010). Given these therapeutic mechanisms, the aim of this clinical trial is to compare the effects of Muscle Energy Technique and Positional Release Therapy on pain management in individuals diagnosed with Upper Trapezius Myalgia.

Statement of the Study. Comparison of Positional Release Technique and Muscle Energy Technique on Pressure Pain Threshold and Muscle Activity in Young Adults with Upper Trapezius Myalgia.

Aim and need of the Study. The objective of this study is to evaluate and compare the effects of Positional Release Technique and Muscle Energy Technique on pressure pain threshold and muscle activity in young adults diagnosed with Upper Trapezius Myalgia.

MATERIAL AND METHODS

Research Design. The study is experimental in nature. Thirty subjects were selected based on selection criteria were randomly allotted into two groups namely on

1. Experimental group A
2. Experimental group B

Subjects from both groups were assessed for pain and neck disability using NPR and NDI scale prior to treatment and this was recorded as the pre-test value. After pre-test assessment Experimental group, A was given Muscle Energy Technique and Experimental

group B was given Positional Release Technique for a period of 4 weeks. The treatment was given fifteen minutes per day for both groups. Similar assessment was done after intervention and was recorded as post-test value.

Criteria of Selection

Inclusion criteria:

- Both male and female with age group between 20-50
- Diagnosed with upper trapezius myalgia patients
- Subjects who are medically and psychologically fit were only included.

Exclusion Criteria

- Patients with any other illness were excluded in the study.
- The one who do not agree with the study were excluded.

Population

- All the subjects who satisfied the above criteria were taken as the population of the study.

Sample. Thirty participants who met the inclusion and exclusion criteria were selected and randomly assigned into two experimental groups, A and B, using the lottery method, with 15 participants in each group.

Variables

Independent Variable

- Muscle Energy Technique
- Positional Release Technique

Dependent Variable

- Numerical pain rating scale
- Neck disability index

Tools

- Numerical pain rating scale
- Neck disability index

Validity and Reliability of the Tools Used. The Numerical pain rating scale and Neck disability index is a valid and reliable tool to measure the pain and neck disability

Setting. The study was conducted at Department of Physiotherapy, Aarupadai veedu Medical College and Hospital, Puducherry.

Methodology and Procedure. Ethical clearance for the study was secured from the institutional sub-ethical committee. In this cross-sectional study, 30 participants aged between 20 and 50 years, both male and female, diagnosed with Upper Trapezius Myalgia and meeting the inclusion and exclusion criteria, were enrolled, which again divided into two group. Group A Muscle Energy Technique and Group B Positional Release Technique. Pre-and post-assessment of pain for all patients NPRS (Numerical pain rating scale), cervical ROM and NDI (Neck disability index) score. Perform the PRT by positioning the participant in specific postures that target muscle trigger points or tight areas (e.g., upper trapezius). Apply gentle pressure and hold the position to facilitate muscle release and relaxation for approximately 15 minutes apply MET to the participant. MET involves palpating and releasing tension in the muscle by combining precise pressure with active movements performed by the participant.

Table 1: Pre and Post Treatment (Group A) effect of MET on NPRS.

Treatment (Group A)	Mean	Std. dev.	SEM	P value
Pre Treatment	7.4	0.8281	0.2138	0.000*
Post Treatment	1.533	1.06	0.2737	

Table 2: Pre & Post Treatment (Group B) effect of PRT on NPRS.

Treatment (Group B)	Mean	Std. dev.	SEM	P value
Pre Treatment	6.8	0.7746	0.2	0.000*
Post Treatment	1.4	1.352	0.3491	

Table 3: Post treatment comparison of NPRS Between Group A & Group B Group.

Group	Mean	Std. dev.	SEM	P value
Group A (15)	1.53	1.06	0.2737	0
Group B (15)	1.4	1.352	0.3491	

Table 4: Pre & Post Treatment (Group A) effect of MET on NDI.

Treatment (Group A)	Mean	Std. dev.	SEM	P value
Pre Treatment	7.8	0.926	0.1838	0.000*
Post Treatment	11.13	2.416	0.6239	

Table 5: Pre & Post Treatment (Group B) effect of PRT on NDI.

Treatment (Group B)	Mean	Std. dev.	SEM	P value
Pre Treatment	7.1	0.8246	0.312	0.000*
Post Treatment	3.067	4.696	1.212	

Table 6: Post treatment comparison of NDI score between two group.

Group	Mean	Std. dev.	SEM	P value
Group A (15)	11.13	2.416	0.6239	0
Group B (15)	3.067	4.696	1.212	

RESULTS AND DISCUSSION

When comparing the two interventions, both Muscle Energy Technique (MET) and Positional Release Therapy (PRT) demonstrated significant improvements in pain reduction and neck mobility, with a statistically significant p-value of 0.000. While MET is frequently used to address active trigger points within the upper trapezius, incorporating ischemic compression and strain-counter strain techniques has been shown to produce even greater improvements in patients with Upper Trapezius Myalgia and non-specific neck pain. One advantage of the PRT approach over MET is its ability to eliminate movement restrictions by reducing protective muscle spasms, fascial trigger points, joint hypomobility, pain, swelling, and by enhancing circulation and muscular strength. PRT primarily influences the muscle spindle and its associated reflex mechanisms, promoting a more normal firing pattern of

the spindle fibers and restoring balanced tension within surrounding soft tissues, which leads to pain reduction. Additionally, PRT helps to diminish the hyperactivity of the myostatic reflex arc and decreases afferent nerve impulses that may cause an overflow of neurotransmitters into corresponding dermatomes, resulting in referred pain—a condition referred to as a facilitated segment. Through these mechanisms, PRT facilitates more efficient natural healing processes, reduces localized spasms, improves range of motion, decreases pain, restores circulation, enhances lymphatic drainage, and promotes better overall biomechanics. Similarly, MET has shown significant effectiveness in treating trapezius muscle spasms. Post-isometric relaxation (PIR), a key mechanism of MET, involves a reduction in muscle tone following an isometric contraction. This occurs through the action of Golgi tendon organs, which are located in the tendons of the contracting muscles. When the muscle is overstretched, these receptors inhibit further contraction as a protective mechanism, thereby promoting muscle relaxation and elongation. During MET, a strong isometric contraction followed by an equal counterforce activates the Golgi tendon organs, sending afferent impulses to the dorsal root of the spinal cord where they synapse with inhibitory motor neurons. This inhibits efferent signals to the muscle, resulting in reduced tone and subsequent muscle relaxation and lengthening. Golgi tendon organs respond to both active and passive movements; therefore, passive joint mobilization can sometimes achieve similar muscle relaxation benefits as direct soft tissue massage.

CONCLUSIONS

This study compared the effectiveness of Muscle Energy Technique (MET) and Positional Release Technique (PRT) for treating Upper Trapezius Myalgia. Both techniques led to significant improvements in pain reduction and neck function. However, MET proved to be more clinically effective than PRT, showing greater reductions in pain and better functional outcomes. MET's superiority may be due to its mechanism of post-isometric relaxation and improved blood flow. While PRT also offered relief, it was less effective compared to MET in this study. The findings suggest that MET is a preferable treatment for Upper Trapezius Myalgia, although further studies with larger sample sizes and longer follow-ups are recommended to confirm these results.

FUTURE SCOPE

Further research with larger sample sizes and longer follow-up periods is recommended to validate and strengthen the findings of this study. Investigations comparing MET and PRT in different age groups, occupational settings, and chronic cases of Upper Trapezius Myalgia could provide deeper insights. Additionally, combining MET and PRT with other therapeutic modalities, such as ergonomic interventions and exercise therapy, may be explored to evaluate their synergistic effects on pain management and functional

improvement. Incorporating objective outcome measures, such as electromyography (EMG) and ultrasonography, could also enhance the understanding of the underlying physiological changes associated with these manual therapy techniques.

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Conflict of Interest. None.

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