

Effect of Manual Pressure Release and Muscle Energy Technique for Treating Mechanical Neck Pain Due to Upper Trapezius Trigger Point - A Case Study

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ABSTRACT

Among all ages, neck discomfort is among the most prevalent and debilitating musculoskeletal problems; it affects 30% to 50% of the population every year, with women being more likely to experience it. Because of decreased muscular strength and limited range of motion in the neck, this disease causes the accessory neck muscles to contract more often, which in turn makes repetitive motions involving the upper limbs more painful. Small, nodular tight bands called "trigger points" may develop in the neck muscles as a result of physical deconditioning, inactivity, and repeated strain. Problems with the upper body's muscles and joints are made worse by these trigger points. This research aims to determine if mechanical neck discomfort caused by trigger points in the upper trapezius may be effectively treated using muscle energy method and manual pressure release. After two weeks of therapy, patients' pain levels and functional capacities were assessed using the Visual Analogue Scale (VAS) and the Neck Disability Index (NDI). This research found that individuals experiencing neck discomfort from trigger points in the upper trapezius muscle responded well to a combination of manual pressure release and muscle energy method.

KEYWORDS: Manual pressure release, trigger points, muscle energy technique, neck pain

INTRODUCTION

Neck pain ranks among the most prevalent disabling musculoskeletal conditions across all age groups, affecting 30%-50% of the general population within a year, with a higher incidence observed among women. This condition is often exacerbated during repetitive upper limb tasks due to increased activation of accessory neck muscles, stemming from reduced neck muscle strength and limited range of motion.¹ The primary contributors to neck pain include direct trauma, intervertebral disc issues, ligament and muscle impairment, facet joint

problems, dural conditions, and nerve root disorders.²

Prolonged bad posture or persistent aberrant physiological stressors are the usual causes of non-specific neck discomfort, which may or can't radiate to the limbs. Musculoskeletal imbalance in the upper body is exacerbated by the formation of tiny nodular tight bands called "trigger points" in the muscles around the neck, which may be caused by physical deconditioning, inactivity, and repeated strain.⁴

When compressed, a myofascial trigger point - a highly sensitive spot within a tight band

of skeletal muscle - refers pain in a particular pattern and may cause motor dysfunction. Mechanical neck pain (MNP) is strongly associated with weak muscles in the cervical spine. There are noticeable patterns of transferred pain from trigger points in certain muscles. Localised muscular stiffness and tightness leading to transferred pain is the hallmark of myofascial pain syndrome, a kind of myalgia. The characteristic feature of this condition is the existence of trigger points, which are painful or uncomfortable bands of tight muscular tissue that may be crushed involuntarily.^{5,6}

Referred pain patterns associated with trigger points in muscles like the upper trapezius typically include the posterior-lateral cervical spine, temporal region, and behind the ear.⁷ Myofascial trigger points exist in two forms: Active and Latent. Active trigger points induce pain both at rest and during movement, while latent trigger points cause discomfort only when palpated. Complex clinical symptoms are common in patients with both kinds of trigger sites. Neck and head pain trigger points are often associated with the sub-occipitalis, sternocleidomastoid, splenius capitis, and upper trapezius muscles.⁸

Another name for manual pressure release (MPR) is "inhibition," although it has also been called "sustained manual pressure," "ischemic compression," and "trigger point release." It is a method of treating trigger points using manual therapy. One way to treat myofascial trigger points (MTrPs) is by pressing a thumb or fingertip firmly on the tissue barrier of the point for an extended period of time until the pain is manageable. The purpose of myotonic peptide release (MPR) is to lengthen the sarcomeres inside the knotted, injured muscle fibres.¹

Slow, prolonged stretching causes muscle fibres to lengthen, which is the main premise of muscular stretching resistance training (MPRT). This process aims to alleviate the tightness and alleviate pain associated with myofascial trigger points.¹

Muscle energy method (MET) is a non-invasive manual treatment that directly

targets hypertonic muscles in an effort to normalise their length and range of motion. A variation on manual pressure release (MPR), this method uses post-isometric stretching to lengthen the sarcomeres inside knots of constricted muscle, relieving discomfort and tension in the affected muscles. (MTrPs).^{1,10}

When compared to other manual treatments, MET is the most effective for treating trigger points in the upper trapezius muscle. Autogenic inhibition is the process of causing the afflicted muscle to contract isometrically and then relax after the contraction, which is made possible by the Golgi tendon organs. Furthermore, antagonistic muscle groups may be targeted with MET to generate reciprocal inhibition, which further assists in relaxing the main muscle implicated.

Overall, MET is commonly utilized to achieve muscle tonus release (inhibition) before stretching, making it a versatile approach in manual therapy for addressing musculoskeletal pain and dysfunction associated with myofascial trigger points.^{1,10}

CASE DESCRIPTION

A 22-year old female reported a deep pain in her neck area which is non radiating and insidious in onset and gradually progressive. The pain aggravated during lifting heavy weights, driving, and prolonged upper limb activities. Initially she rested and took pain medication to alleviate the pain, since the pain didn't subside, she visited physiotherapy OPD. On examination trapezius muscle tightness was present. Grade III tenderness was noted upon palpation of trapezius muscle mainly the upper part of the muscle.

Her physiotherapy objectives were to reduce pain, improve the functional ability and maintain the strength and enhance the activities of daily life.

In order to determine the initial state of affairs, the Visual Analogue Scale (VAS) was used to quantify degrees of pain and impairment, and the Neck Impairment Index

(NDI) was used to evaluate functional capacities.

INTERVENTIONS

Days	Treatment
Day 1	Introduction to MET focusing on the upper trapezius muscle Gentle post isometric relaxation (PIR)- starts with light contraction holding for 7-10 seconds, followed by stretching. Reciprocal inhibition (RI)- isometric contraction of antagonist muscle for 7-10 seconds Manual pressure release starting with 30seconds hold 3 sessions
Day 2	Gentle contraction and light strengthening and PIR hold for 7-10 sec contraction RI- hold for 7-10 sec Manual pressure release starting with 45second hold for 3 sessions.
Day 3	PIR and RI both hold for 7-10 seconds contraction with 3-4 repetition per session Manual pressure release with 60 second hold 3 sessions.
Day 4	PIR and RI 10-15 seconds hold with 3repetition Manual pressure release with 60 second hold
Day 5	PIR and RI both 30 second hold with 3 reps
Day 6	PIR and RI 30 second hold

Manual pressure release

Patient Position: The patient was lying on their back with their neck in a neutral position.

Technique: While palpating the upper trapezius muscle using pincers, the therapist was able to locate dormant Myofascial Trigger Points (MTrPs). The therapist lightly pressed their thumb over the MTrPs, slowly increasing the pressure until they encountered a barrier of tissue resistance. The therapist would keep applying this pressure until they felt the tissue barrier relax, and then they would ramp it up again to locate a new barrier. After 60 seconds or until the MTrP-related tension and soreness subsided, the procedure was repeated.

Dosage: There was a total of six therapy sessions spread out over two weeks; each session lasted one week and were separated by at least two days.

Muscle energy technique

Patient Position: The subjects were lying on their backs with their cervical spine in a neutral position.

Technique: With one hand, the practitioner stabilised the injured side's shoulder, while the other hand held the affected side's ear or mastoid region. After that, the neck and head were twisted to face the same side, flexed

forward, and then gently bent to the other side. The participant was told to delicately bring the affected shoulder up towards their ear using a submaximal, pain-free effort, around 20% of their power. The subject kept this isometric contraction for 7–10 seconds while breathing normally.

While focusing on relaxation, the therapist would progressively tighten the stretch by bringing the head and neck into more flexed, rotated, and side-bending positions. Three or five times per session, the participant would hold each stretch position for thirty seconds. Dosage: There were a total of six therapy sessions, spread out over two weeks at a rate of three per week with a minimum of two days in between.

RESULT

Outcome measurements, including the Visual Analogue Scale (VAS) and the Neck Disability Index (NDI), showed a significant improvement after therapy.

Table 1 – Outcome measures. The results showed that after the 2-week intervention, the VAS and NDI scores improved significantly.

Outcome measures	Pre test	Post test
Visual Analogue Scale (VAS)	8/10	3/10
Neck Disability Index (NDI)	22/50	14/50

DISCUSSION

Mechanical neck discomfort caused by trigger points in the upper trapezius muscle was the focus of this research, which sought to evaluate the effectiveness of muscle energy methods and manual pressure release. The patient was given 2 weeks of physiotherapy intervention. Before starting the rehabilitation, the initial pain using VAS, functional limitation using NDI was measured. On the last day, prognosis of pain and functional ability was measured. The result shows that, after 2 weeks of treatment there was significant reduction in the NDI and VAS scale. Manual pressure release along with MET resulted in greater pain relief and also helpful in minimizing the inability of the body to perform functional activities.

Neck discomfort caused by upper trapezius trigger points may be effectively reduced with only two weeks of manual pressure release and MET, according to this research. Researchers Richa Kashyap et al. (2018) found that when it came to treating nonspecific neck pain, both manual pressure release and muscle energy techniques (MET) were just as effective as one another in reducing muscle pain and tenderness, improving neck disability and range of rotation, and relieving upper trapezius trigger points.¹

In 2020, Amir Iqbal et al. sought to replicate this study by examining the short-term and immediate effects of combining two therapeutic techniques to alleviate muscle tenderness and neck pain in male patients with active MTrPs in the upper trapezius. The researchers found that the combination of MET and ischemic compression technique improved the pain and tenderness in the upper trapezius both immediately and in the short-term.¹¹

In 2012, Richa Mahajan et al. investigated the effects of static stretching vs. muscle energy technique on active cervical range of motion and pain intensity in patients with subacute mechanical neck pain. The researchers found that the former method

was more effective in reducing pain and increasing active cervical range of motion.¹² Studying the therapeutic benefits of MET compared to alternative manual or rehabilitative therapies for non-specific acute and chronic neck pain, Silvia Sbardella et al. (2021) performed the research. Based on the inclusion and exclusion criteria, twenty-one publications were chosen for this research. Fifteen of these papers dealt with non-specific acute neck pain, and six with non-specific chronic neck pain. The research found that when paired with standard rehabilitation, the MET method effectively reduces acute neck pain and increases cervical range of motion in chronic neck pain patients. It was also shown to be more effective when used alone.¹³

The current research found significant reduction in pain and functional impairment as assessed by the Visual Analogue Scale and the Neck impairment Index, which were used as end measures. Joshua A. et al. (2008) found substantial evidence that the NDI scale is valid and reliable. The validity and reliability of the Visual Analogue Scale were investigated by P. E. Bijur et al. It seems that the VAS has a good level of reliability for measuring pain, as determined by ICC. Ninety percent of the pain assessments were repeatable within 9 millimetres. The results of this study provide credence to the idea that VAS may accurately measure acute pain.¹⁴ Researchers M.J.H. McCarthy, M.P. Grevitt, and colleagues examined the reliability and validity of the neck disability index. According to the findings, the NDI is less time-consuming to complete and scores more accurately. Both the reliability and validity of NDI are high, and it performs well on the SF36.¹⁵

The results of this research show that conservative treatments may alleviate mechanical neck discomfort caused by trigger points. Exercise rehabilitation, in particular, showed remarkable results in a very short period of time.

CONCLUSION

Patients suffering from mechanical neck discomfort caused by trigger points in the upper trapezius muscle showed significant improvements in both pain alleviation and functional capacities after receiving MET and manual pressure release, according to the study's results.

Declaration Of Patient Consent

All required patient permission forms have been obtained, as the writers confirm. The patient or patients have signed off on the form allowing their images and medical records to be published in the publication. Although every care will be taken to ensure the patients' privacy, we cannot promise that their names or initials will remain concealed in any public materials.

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