

EFFECT OF PHYSIOTHERAPEUTIC INTERVENTION ON VARIOUS PARAMETERS IN A PATIENT OF UPPER CROSS SYNDROME- A CASE STUDY

Community Physiotherapy

Dr Prisha Bhagat MPT in Neurological Sciences

**Chalodiya Foram
Anilbhai**

**Kakadiya Parina
Umeshbhai**

**Kumavat Nirdosh
Gherilal**

**Vadodariya Shreya
Hasmukhbhai**

ABSTRACT

Introduction: Upper cross syndrome can be defined as collective postural dysfunction of the musculature of the shoulder girdle and cervicothoracic area.[1] It is characterized by tightness of one group of muscle and weakness of another group of muscle. Appearance of its change can be scan as the letter 'X' in upper quadrant of body.[2] These abnormal postural variation leads muscular imbalance, pain and decrease ROM, this change can cause more stress on muscle and restrict the movement.[4] Lifestyle of college going student which mainly include seated posture is a flexor dominated posture that further shortens and tightens the musculature on a vertical side of body and lengthens while weakening the musculature on dorsal side of the body.[3] Student having a prevalence of 37.15%.[2] There are many therapeutic methods that have been used in patient with UCS, as like physical therapy, exercise, electrotherapy, adhesive taping, stabilization exercise, strengthening exercise stretching myofascial release, muscle energy techniques. This can be used to normalize joint mobility in abnormal structure.[1] **Objective:** The purpose of this study was to evaluate the effectiveness of MET on tight muscles and strengthening exercises for weak muscles in the management of UCS. **Methodology:** The subject of the study was a second-year physiotherapy student presenting with UCS symptoms attributed to prolonged forward head posture, slouched sitting habits, and a sedentary lifestyle. A 21-day intervention program was implemented, involving MET for tight muscles and strengthening exercises for weak postural muscles. This case study highlights the efficacy of combining MET and strengthening protocols to address postural imbalances and muscular dysfunctions associated with UCS. MET was applied to improve muscle extensibility and relieve tension in shortened muscles, while targeted strengthening exercises were used to restore stability and postural alignment. **Result:** The findings of this study demonstrate that both MET and strengthening exercises, when combined with conventional physiotherapy approaches, contribute significantly to reducing pain, improving posture, enhancing muscle flexibility, and restoring functional capacity in individuals with UCS. The patient's measurable improvements in outcome measures such as MMT, MLT, and NDI further support the clinical effectiveness of this integrated approach. **Conclusion:** In conclusion, the use of MET in conjunction with strengthening exercises presents a conservative, non-invasive, and effective physiotherapeutic strategy for the rehabilitation of Upper Crossed Syndrome. This combined intervention can be confidently incorporated into clinical practice for managing patients with UCS, promoting better posture, muscular balance, and long-term symptom relief.

KEYWORDS

Upper Cross Syndrome, Postural Dysfunction, MET, Strengthening Exercises

INTRODUCTION

Upper cross syndrome can be define as collective postural dysfunction of the musculature of the shoulder girdle and cervicothoracic area.[1] It is characterized by tightness of one group of muscle [pectoralis major, upper trapezius, levator scapulae] and weakness of another group pf muscle [deep neck flexor middle and lower trapezius and serratus anterior].[2] It can cause abnormality in thoracic spine curvature and glenohumeral joint.[3] Appearance of its change can be scan as the letter 'X' in upper quadrant of body.[2]

Due to this deformity, alteration across in biomechanics of glenohumeral joint and cervical spine.[3] These abnormal postural variation leads muscular imbalance, pain and decrease ROM, this changes can cause more stress on muscle and restrict the movement.[4] Lifestyle of collage going student which mainly include seated posture is a flexor dominated posture that further shortens and tightens the musculature on a vertical side of body and lengthens while weakening the musculature on dorsal side of the body.[3]

MET is an osteopanic tissue manipulation technique involving precision directed and controlled active isometric and isotonic contractions to enhance musculoskeletal function and reduce pain.[5] Recently muscle energy technique is going popularity among other therapeutic modalities aimed at enhancing elasticity of contractile and non-contractile tissue.[4]

It is a hands-on therapy applied by manual method used to lengthening of tight muscle of contracture, normalize or enhance joint range, increase flexibility, increase muscular extensibility, induce muscle stretching, strengthening and relaxing.[6] MET reduce sympathetic tone through facial stimulation and localized vasodilation.[7]

This pain free mobilization technique which is used to regain mobility reduce edema, reduce muscle spasm, increase fluid dynamics and mobilize restricted joint and improve local circulation. Due to reciprocal inhibition, actively contraction of agonist muscle and relaxation of antagonist muscle facilitation mobility at the joint.[8]

Significance of the Study

UCS is a common postural dysfunction characterized by muscle imbalances, including tightness in the suboccipital, and pectoral muscles, along with weakness in the deep neck flexors, rhomboids, and trapezius. It is frequently observed in individuals with prolonged sitting postures, such as students, office workers, and individuals with sedentary lifestyles, leading to neck pain, shoulder discomfort, restricted mobility, and postural instability.

This case study evaluates the effectiveness of MET for tight muscles and strengthening exercises for weak muscles in addressing UCS-related dysfunctions. By utilizing MET to improve flexibility and reduce muscular tension and targeted strengthening to restore postural balance, this study provides a conservative, non-invasive physiotherapy-based approach to managing UCS.

METHODOLOGY

1.1 Study Design: - Case report

1.2 Study Settings: -

Vidhyadeep charitable trust
AT & PO – Anita, Kim-Olpad Highway

1.3 Outcome Measures: -

Numerical Pain Rating
Scale Neck Disability

Measure Muscle Length Testing Manual Muscle Testing

This case study investigates the assessment and management of Upper Crossed Syndrome through the use of MET and strengthening exercises. The study involved one participant, second-year physiotherapy who voluntarily agreed to take part in the study.

Prior to the commencement of the intervention, informed consent was obtained from participant. The consent form detailed the study's purpose, which was to explore the effectiveness of MET and strengthening exercises in alleviating postural imbalances and muscular dysfunction associated with Upper Crossed Syndrome.

Participant was informed about the study procedures, including the assessment of their posture, implementation of MET, and a structured strengthening exercise program. She was assured that her participation was voluntary and that she could withdraw from the study at any time without repercussions.

The consent form also emphasized the confidentiality of their data. To protect her identity, pseudonyms were used in all documentation and publication of the findings. Additionally, participant was informed that the study posed minimal risk and that all procedures adhered to ethical standards as outlined by [institution/national ethical guidelines].

Signed consent form was collected from each participant and securely stored for record-keeping purposes, ensuring full compliance with ethical research practices.

This case study aimed to evaluate the effectiveness of MET and targeted strengthening exercises in the management of UCS. A single-subject design was employed to investigate the participant's response to treatment in a controlled and systematic manner. The study focused on improving postural alignment and reducing muscular imbalances, specifically addressing the tightness of the upper body and weakness in stabilizing muscles.

1.4 Participant Selection: -

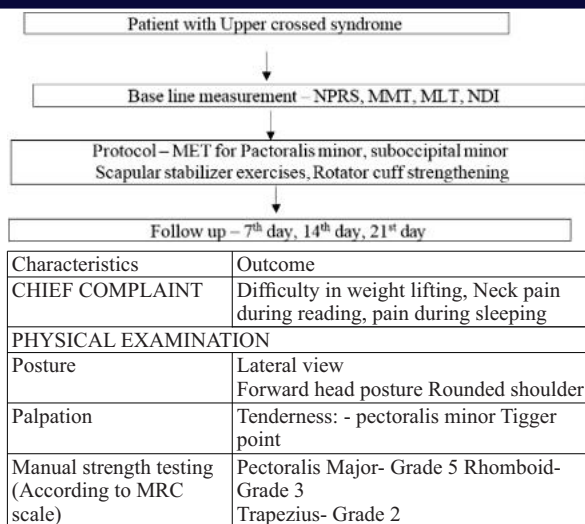
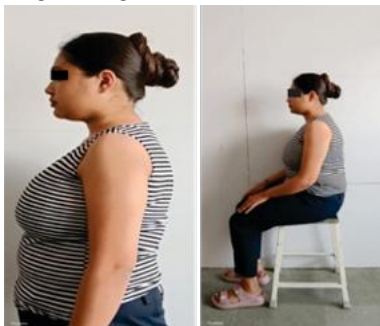
The participant was a second-year female physiotherapy student diagnosed with Upper Crossed Syndrome, characterized by the forward head posture, rounded shoulders, and imbalance between the muscles of the neck, shoulders, and upper back. She was chosen based on the following inclusion criteria:

1. Diagnosis: Confirmed presence of Upper Crossed Syndrome by clinical observation.
2. No Contraindications: No prior history of traumatic injury, surgery, or neurological impairments affecting the musculoskeletal system.
3. Voluntary Participation: The participant willingly agreed to partake in the study after being fully informed about the procedures and providing signed written consent. She was assured that participation was voluntary and she had the right to withdraw at any time without consequences.

1.5 Base Line Assessment: -

To establish a clear starting point for the intervention, baseline evaluations were conducted, enabling the comparison of outcomes after the treatment period.

- I. Postural Analysis: - Visual and photographic assessment for alignment deviations.
- II. Manual muscle testing: - Oxford Scale Pectoralis Major – Grade 5 Rhomboid – Grade 3 Trapezius – Grade 3
- III. Pain and Discomfort: Numeric Pain Rating Scale- 8
- IV. Muscle Length Testing: - Pectoralis Minor – 12.5 cm



1.6 Intervention: -

The treatment plan aimed to restore optimal posture by focusing on various movement patterns. Throughout the 3-week period, we employed UCS-specific stabilization exercises along with more muscle energy techniques to improve overall function in everyday activities.

Weekly Breakdown of Sessions: -

Week 1:-

1. MET for pectoralis minor and suboccipital minor 3 set with 6 repetitions.
2. Chin tuck exercise 15 repetitions without hold.
3. Scapular stabilizer exercises for trapezius and latissimus dorsi, 15 repetitions without hold.
4. Rotator cuff strengthening specifically for external rotator 10 repetitions.

Week 2:-

1. MET for pectoralis minor and suboccipital minor 3 set with 6 repetitions.
2. Chin tuck exercise 15 repetitions with 5 second hold.
3. Scapular stabilizer exercises for trapezius and latissimus dorsi, 15 repetitions with 5 second hold.
4. Rotator cuff strengthening specifically for external rotator 10 repetitions with 5 second hold.

Week 3:-

1. Chin tuck exercise 15 repetitions with 10 second hold.
2. Scapular stabilizer exercises for trapezius and latissimus dorsi, 15 repetitions with 10 second hold.
3. Rotator cuff strengthening specifically for external rotator 10 repetitions with 10 second hold.

DISCUSSION

This study was conducted to evaluate the effects of MET on tight muscles and strengthening exercises on weak muscles in a patient diagnosed with UCS. The patient underwent a 21-day rehabilitation program combining MET with targeted strengthening exercises. Outcome measures used to compare pre- and post- intervention results included MMT, MLT, and the NDI.

The results of MMT for the trapezius and rhomboid muscles showed significant improvement, increasing from grade 3 to grade 5 post-intervention, indicating enhanced muscle strength. However, the pectoralis major muscle did not exhibit notable changes in muscle strength, likely due to either structural adaptations or insufficient stimulus from the intervention. MLT for the pectoralis minor muscle demonstrated considerable improvement, with muscle length improving from 12.5 cm pre-intervention to 11 cm post-intervention, indicating reduced muscle tightness and improved posture.

The NDI scores reflected a dramatic reduction in neck-related disability, with the patient's score dropping from 20/50 to 0/50 post-treatment. This suggests a marked improvement in neck function and reduction in pain and discomfort associated with UCS.

A systematic review conducted in 2015 included 12 randomized controlled trials and 14 comparisons, covering a sample size of 500 participants. This review aimed to evaluate the effectiveness of MET

in non-specific lower back pain. Although MET showed potential, the quality of the studies was generally poor, limiting the ability to draw strong conclusions regarding its clinical efficacy.

In 2017, Sajjad Ali conducted a comparative study assessing the role of stretching exercises versus MET in the management of UCS. The findings demonstrated that MET was more effective than stretching alone in decreasing pain, increasing the ROM, and improving overall functional capacity.

Furthermore, Andrea Bernetti et al. (2021) published a systematic review examining the role of MET in the rehabilitative treatment of acute and chronic non-specific neck pain. Their results suggest that MET is more effective when integrated with conventional physiotherapy treatments, leading to better clinical outcomes.

Additional literature supports that MET helps regulate muscle tone through post-isometric relaxation and reciprocal inhibition mechanisms, which contribute to improved muscle flexibility and joint mobility. It also aids in breaking the pain-spasm-pain cycle commonly observed in musculoskeletal dysfunctions.

When combined with strengthening exercises, especially for deep neck flexors, middle and lower trapezius, and rhomboids, the postural corrections achieved are more stable and long-lasting.

Moreover, MET has been found to improve circulation to the affected areas, reduce muscle fatigue, and promote better alignment of the shoulder girdle and cervical spine key issues in UCS. The combined approach not only corrects the muscular imbalances but also helps retrain the neuromuscular system, improving posture awareness and reducing the likelihood of recurrence.

1.7 Limitations:

1. Small Sample Size
2. Lack of Long-Term Follow-Up
3. Limited Control over External Factors
4. Possible Adverse Effects

CONCLUSION

This study shows that combining conventional physiotherapy with strengthening exercises and the MET can effectively improve muscle balance and postural alignment in people with Upper Crossed Syndrome. These approaches work well together by helping to relax tight muscles and strengthen weaker ones, leading to better posture and overall muscle function. The results suggest that using both techniques together can be a practical and effective way to manage UCS in clinical settings.