



# “EFFECTIVENESS OF MUSCLE ENERGETIC TECHNIQUE VERSUS EFFECTIVENESS OF POSITIONAL RELEASE AND TAPING TECHNIQUE IN THE CASE OF UPPER TRAPEZIUS SPASM”

– A COMPARATIVE STUDY

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## ABSTRACT

**OBJECTIVE:** To find out the effectiveness of MET versus PRT with Taping for patients with UT spasm.

**METHODS:** 30 patients with UT spasm aged between 30 to 45 years (male and female working in office & school) were selected for the study. They were assessed and randomly divided into two equal groups consisting 15 patients in each group. Group A patients were assigned to receive MET and group B patients

were assigned to receive PRT with Taping. Treatment was given for 10 days.

**OUTCOME MEASURES:** Data was obtained on pain intensity levels, active range of motion (AROM) and functional disability via visual analogue scale (VAS), cervical active range of motion for lateral flexion and rotation by goniometry and neck disability index (NDI) respectively.

**RESULTS:** Study showed significant ( $p < 0.05$ ) reduction in pain, increased range of motion and decreased disability in both groups. But group A patients showed greater reduction in pain (VAS), increased AROM in lateral flexion and rotation and a greater reduction in disability (NDI) than group B patients after 10 days of treatment.

**CONCLUSION:** The findings of this study provide strong evidences that the MET is more effective in reducing pain, improving CAROM, and functional ability as compared to PRT and Taping over a period of 10 days of treatment in patients with neck pain due to UT spasm.

## INTRODUCTION

### NEED FOR STUDY:

Neck pain is a common disorder with a reported six months, prevalence rate of 54 %. Nonspecific Neck pain can be defined as the shape 676 patho anatomical source of an individual’s pain that cannot be identified.

Women are more affected than men, women of working age are more effected than older ones.

A trigger point has received a little scientific emphasis in a nonspecific neck pain. Trigger point have been found to frequently occur in individuals neck pain as compared to their age matched controls.

The one of the most common cause of neck pain is Upper Trapezius (UT) spasm. It is necessary to know about the trapezius muscle before we go through the condition of Upper Trapezius muscle.

### Anatomy and Functions of Trapezius:

Name of fiber	Origin	Insertion	Nerve Supply	Function
Upper	Occiput	Lateral 1/3	C2-C4	Elevation of Scapula
Middle	Spinous processes of seventh cervical & upper thoracic vertebrae	Superior lip of scapula	C2-C4	Adduction of scapula



Lower	Supraspinous ligament spinous processes of D7 vertebrae	Upper & border & tuberosity at base of spine of scapula	C2-C4	Upward rotation, depression & adduction of scapula
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All the functions of trapezius muscles helps to bring the head and neck in the backward direction to rotate and side bend the neck, to assist in breathing.

Because of the Trapezius muscles works to move in several directions its degree of tightness or looseness effects neck flexibility .For people who work at desk and computer or who spend many hours driving, the upper trapezius is the muscles on the top of your shoulder that becomes very sore & painful.

The limited range of motion (ROM) and a subjective feeling of stiffness may accompany neck pain, which is often precipitated or aggravated by neck movements or sustained neck posture.

The Trapezius muscles spasms typically occurred when Trapezius muscle is torn, stretched or strained. This can occur from an unexpected fall, from lifting heavy objects frequently, twisting while lifting something or an abrupt movement that strains the Trapezius muscles.

Spasms of the Trapezius muscle can be accompanied by stiffness, pain, tingling and weakness.

Different medicines such as muscle relaxant,NSAIDS etc. and the various physiotherapy treatment method used in the management of Trapezius spasm are myofascial release ,massage, stretching, ultrasound, muscle energy technique (MET) ,positional release technique , Taping etc.

A potential treatment option, MET, is a form of active stretch commonly used in a manual therapy to increase the range of motion.

There are evidences proving that MET over upper trapezius muscles is effective in relieving muscles pain improving range of motion of neck in patient with upper trapezius muscles spasm. Muscle energy techniques are a class of soft tissue osteopathic (originally) manipulation methods that incorporate precisely directed and controlled, patient initiated, isometric and/or isotonic contractions, designed to improve musculoskeletal function and reduce pain.

A non-invasive technique, MET can be used to lengthen a shortened contracted or spastic muscle; to strengthen a physiologically weakened muscle or group of muscles; to reduce localized oedema to relieve passive congestion and to mobilize an articulation with restricted mobility.

The effects may result from the inhibitory Golgi tendon reflex, activated during the isometric contraction that leads to reflex relaxation of the muscle, as a result of post isometric relaxation (PIR).An alternative reflex effect has been suggested in which an isometric contraction of the antagonist(s) of affected muscle(s) induce relaxation via reciprocal inhibition (RI).

Another effective technique is combination of Positional Release and Tapping in the case of Upper Trapezius (UT) spasm.

Positional release therapy (PRT) is a method of total body evaluation and treatment using tender points (TPs) and a position of comfort (POC) to resolve the associated dysfunction.

PRT is an indirect (the body part moves away from the resistance barrier, i.e., the direction of greatest ease) and passive (the therapist performs all the movements without help from the patient) method of treatment.

Positional release therapy acts on the muscle spindle mechanism and its associated reflex mechanism (which controls spasm) to promote a more normal firing of the spindle and a more normal level of tension in the muscle, which results in a more normal relationship within the various tissues surrounding the area.

Till the date different literature has been published and established the good effect of muscle energetic technique and combination of Positional Release and Taping Technique in Upper Trapezius Spasm but no literature has addressed the comparison between the MET and combination of Positional Release and Taping Technique in that condition.

Therefore, the purpose of this study is intended to know the MET or combination of Positional Release and Taping Technique is effective or both has same effect on the upper trapezius spasm patient with nonspecific neck pain.

## AIMS AND OBJECTIVES

- To determine the effect of muscle energy technique in reducing pain and improving functional range of motion among patients with upper trapezititis.
- To determine the effect of Positional Release and Taping technique in reducing pain and improving functional range of motion among the patients with upper trapezititis.
- To compare the effectiveness of muscle energy technique over Positional Release and Taping technique in reducing the pain and improving functional range of neck among patients with upper trapezititis.

## Hypothesis

### Null Hypothesis (H<sub>0</sub>):

There will no significant difference between Muscle energy technique & combination of Positional Release and Taping technique in reducing pain and improving the functional range among the upper trapezius spasm patient.

### Alternative Hypothesis (H<sub>1</sub>):

There will be significant difference between Muscle energy technique & combination of Positional Release and Taping technique in reducing pain and improving the functional range among the upper trapezius spasm patient.

## REVIEW OF LITERATURE:

**Jagatheesan Alagesan & Unnati S. Shah studied the Effect of Positional Release Therapy and Taping On Unilateral Upper Trapezius Tender Points - Randomized Controlled Trial**

**International Journal of Health and Pharmaceutical Sciences 07/2012; 1(2):13- 17.**

**.Michael A Seffinger** Antagonistic inhibition muscle energy techniques use the agonist-antagonist spinal cord reflex of a hypertonic muscle to reciprocally inhibit the hypertonic muscle tone.

**Agnes Paul-Dauphin et al** Visual analogue scales (VAS) are often used in epidemiologic and clinical research to measure the intensity or frequency of various clinical symptoms, particularly pain. They are generally completed by patients themselves but are sometimes used to elicit opinion from health professionals. VAS are more sensitive to small changes than are simple descriptive ordinal scales in which symptoms are rated, for example, as mild or slight, moderate, or severe to agonizing.

**Jagatheeshan Alagesan, Unnati S Shah** studied the effectiveness of positional release therapy and taping on unilateral upper trapezius tender points. The study was conducted on 60 subjects around the age group 20 to 30 having unilateral upper trapezius tender point. The study concluded that conventional treatment with positional release technique or conventional treatment with taping is equally effective in tender point of upper trapezius muscle as like the conventional treatment by moist heat and shoulder girdle exercises.

**Kari Anne Holte, Rolf H. Westgaard et al (2004)** They studied daytime trapezius muscles activity and shoulder-neck pain of service workers with work stress and low biomechanical exposure. And the result was Stress-induced shoulder and neck pain is not necessarily associated with elevated trapezius muscle activity, but pain-free workers may benefit from better muscle relaxation in leisure.

**HERALD BRODIN, et.al (2003):** Conducted an experimental study on 41 subjects with myofascial pain syndrome. The purpose of the study was to find out the effectiveness of muscle energy technique in patients with myofascial pain syndrome over periscapular muscles. The treatment duration was 3 weeks. The result of the study shows that there was a significant reduction in pain and improvement of range of motion of cervical spine.

**Rebecca Marshall et al (2002)** Evaluating the effectiveness of myofascial release to reduce pain in people with myofascial pain syndrome and conclusion was myofascial release may help reduce the severity of muscle pain in people with myofascial pain syndrome.

**Hanten W P et al (2002)** Ischemic pressure and sustained stretching was shown to be effective in reducing trigger point sensitivity and pain intensity in individuals with myofascial trigger points.

**Lewit. K, et.al (1999):** conducted an experimental study on 70 patients with myofascial pain syndrome. The purpose of the study was to find out the effectiveness of muscle energy technique on myofascial pain syndrome. The result of the study shows that there is significant reduction of pain in myofascial pain syndrome following the application of muscle energy technique

**Veeliming et al (1999)** studied the effectiveness of MFR and US for upper trapezius trigger point for 35 subjects, 20 subjects with 4 stretch of 90 second and 15 subject with 1.5 watt/cm<sup>2</sup> intensity and pulsed mode. He found MFR was more effective than modality.

**Viswas Rajduari (2011):** Conducted a study to assess the effectiveness of muscle energy technique on temporomandibular joint dysfunction. The study included 40 patients between 20-30 years diagnosed with temporomandibular dysfunction of less than 3 months duration. Participants were treated with MET, which included post isometric relaxation and reciprocal inhibition given on alternate days for 5 weeks. The subjects were evaluated for pain and maximal mouth opening. The study concluded that MET is effective in reducing pain and improving maximal mouth opening in patients with temporomandibular joint dysfunction.

**Schmerz et al (Dec 2003)** had confirmed about diagnosis and therapy of myofascial trigger points for the upper trapezius spasm. It gives more support for the new diagnosis.

#### **Conclusion of Review Literature:**

From the review of literature, it's it is inferred that UT is an acute condition characterised by pain, spasm, inflammation, associated with reduced neck range of motion .The conventional physiotherapy treatment like ultrasound therapy, icing. Thermotherapy, myofacial release technique etc. are safe and well effective treatment for UT.

Perhaps MET and combination of Positional Release and Tapping technique are safe and well effect for UT.

However till date no literature has addressed the comparison the effectiveness of MET and combination of Positional Release and Tapping technique to reduce pain and improve neck range of motion in case of UT spasm.

So, there is a need of study to compare the efficacy of MET and combination of Positional Release and Tapping technique to reduce pain and improve neck range of motion in case of UT spasm.

## Materials and Methodology

- **Study Area** : Kolkata and Greater Kolkata ( West Bengal )
- **Study Population** : Unilateral Upper trapezius Spasm patients
- **Study Period** : 6 Months in 2<sup>nd</sup> year MPT course
- **Source Of Data** : Samples for the study will be selected from ----  
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BISHUDANANDA Hospital (Kolkata) PARK Hospital (Kolkata)  
Kanak Nursing Home (Bandel)  
CURE PHYSIO REHAB Clinic (BANDEL)  
Colombia Asia Hospital (Salt Lake)
- **Sample Design** : convenience sampling and random allocation
- **Sample Size** : 30
- a) **Group A** : n=15  
(Muscle energy technique)
- b) **Group B** : n=15  
(Combination of Positional Release and Taping Technique)
- **Study Design** : Experimental Research Design
- **Study Variable** : a Pain and Neck Function  
b-----Neck Range of Motion
- **Outcome Measures** : a. Visual Analog Scale (VAS ) for pain intensity  
Measurement and Neck Disability Index for  
neck Function (NDI).  
b. Standardized Goniometer for measurement  
of Neck Range of Motion

### Study Tools

Wooden Stool

Treatment couch

Pillow

Towel

Goniometer  
Stationaries  
Kinesio Tape

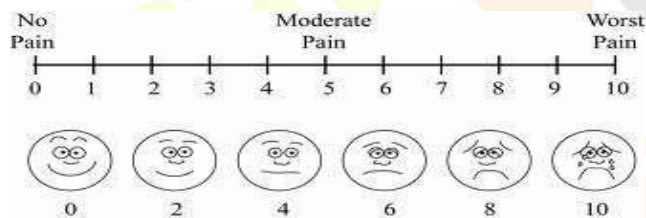
➤ **Statistical Tool**

- Computer
- Calculator
- Data collection chart

➤ **ASSESSMENT TOOLS:**

• **Visual analogue scale(VAS): Pain**

Visual analogue scale is used to measure pain. It has been described that it is the best “paper and pencil” method of assessing the intensity of pain. It consists of a 10 cm long horizontal line with one end depicting ‘no pain’ and the other end depicting ‘worst pain’. The patient was asked to mark his/her pain intensity on this scale as per severity. Patients made visual estimation of his/her pain intensity on the line accordingly. The response was measured in centimetres from the point marked ‘no pain’ and recorded. Two responses were taken, pre-treatment and at the end of 10 days (post treatment).



VAS have been recommended:

No pain (0-4 mm), mild pain (5-44 mm), moderate pain (45-75 mm), and severe pain (75 -100 mm).  
Now therapist ask to patient indicate the pain in VAS scale

• **Goniometer: Active range of motion at the end of cervical range of motion**

Cervical active range of motion was measured clinically by Goniometer. The patients were placed in sitting position with thoracic and lumbar spine back support. The cervical spine is positioned in neutral position. The centre of the fulcrum of the goniometer placed over the external auditory meatus, stationary arm aligned perpendicular to the floor and movable arm aligned parallel to the base of the nares as starting position of measuring cervical range of motion in flexion and extension. The goniometer should be transposed and recorded as 0 (zero) degree.

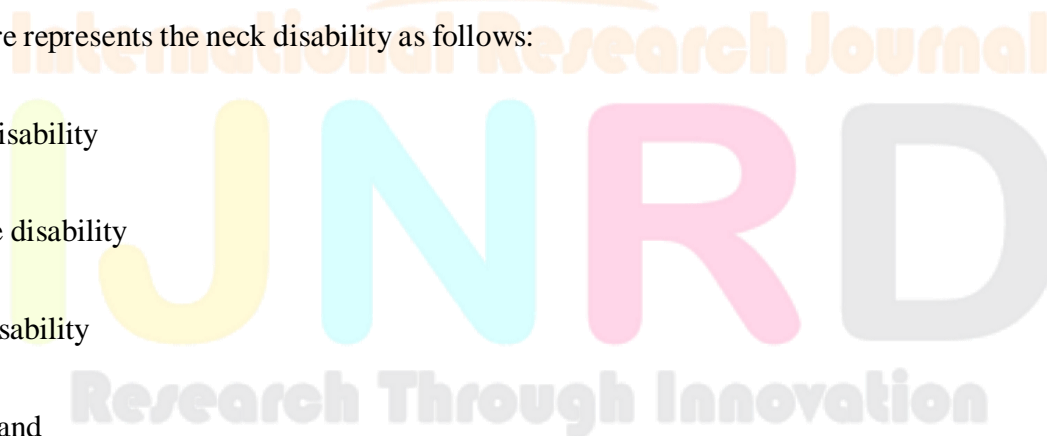
Patients were asked to bring the chin towards his/her chest without leaving the back support to measure

cervical flexion range. At the end range of movement movable arm again aligned with the base of nares and the reading was taken for flexion of cervical spine. Same starting position was maintained to measure the cervical extension range. When assessing the cervical extension, the patients were asked to look upwards, toward the ceiling without thoracic and lumbar extension. At the end range of movement, movable arm again aligned with the base of nares and the reading was taken for cervical extension range. For lateral flexion patient asked to sit in a stool in high sitting position, thoracic & lumbar spine well supported, cervical spine is in neutral position. Fulcrum is placed over spinous process of C7, fixed arm over spinous process of thoracic vertebrae i.e. perpendicular to ground. Moveable arm on occipital protuberance, then asked to patient bend head right & then left as much he/she can. For rotation patient is in same position, fulcrum placed over centre of cranial aspect of head, fixed arm parallel to imaginary line between two acromial processes, moveable arm with the tip of nose, then asked to patient turn your head left then right as much as you can.

- **Neck disability index(NDI):**

The modified version of neck disability index is a self-rated disability health status measure. It is a 10 items scale that assesses disability of the neck, which includes pain, personal care, lifting, reading, headaches, concentration, work, sleeping and recreation. Each item is scaled from 0-5 points. It is scored by summing the responses to each item and expressing the total score as a percentage of the maximum points. If a section is omitted, patient's total score is divided by the number of sections completed time 5. Higher the score, higher the disability. This scale has been used in different populations and has demonstrated high reliability and validity with minimum score 0 and maximum score 50. Two responses were taken, at the time of initial visit and another after 4 weeks. The measurements were blinded to subjects for outcome assessment and statistical analysis. The score represents the neck disability as follows:

- 0-20% minimal disability
- 21-40% moderate disability
- 41-60% severe disability
- 61-80% crippled and
- 81-100% bed ridden



➤ **Study Technique :**

**Inclusion Criteria:**

Both Male and Female

Age group between 30-45 years working in office or school

Clinically diagnosed upper trapezitis patients

Patients with VAS score of 4-9

**Exclusion Criteria:**

Age less than 30 yrs. greater than 45yrs.

Patients with VAS score less than 4.

Cervical instability and any other degenerative disorder.

Neck pain of any other origin.

Recent surgery in and around shoulder and cervical region.

Cervical radiculopathy.

Thoracic outlet syndrome.

**Intervention to be conducted on participants (Methodology):**

A total number of 30 subjects diagnosed with upper trapezitis will be selected based on inclusion and exclusion criteria. After the informed consents obtained, they will be divided into 2 groups namely Group A and Group B, in which each group consists of 15 subjects.

Prior to the treatment pre-test will be conducted for the Group A and Group B to check the pain intensity and neck range of motion(flexion, extension and rotation) using neck disability index and goniometric measurements and data will be recorded.

After a brief demonstration about muscle energy technique, the Group A subjects will be subjected to muscle energy technique over upper trapezius muscle for 10 days.

After a brief demonstration about combination of Ponal Release and Tapping technique, the Group B subjects will be subjected to combination of Positional Release and Taping technique over upper trapezius muscle for 10 days.

## **PROCEDURE:**

### **MUSCLE ENERGY TECHNIQUE (GROUP A):**

The patient is positioned in supine lying with head flexed, rotated towards and laterally flexed away from the stretch. The therapist stabilizes the patient's head with one hand while the other hand is placed on the patients shoulder. Patient is instructed to elevate the shoulder towards the ear at the same time therapist give equal and opposite resistance and hold it for 10 seconds. Then ask the patient to relax. The therapist then moves to the new resistance barrier. This procedure will be repeated for 5 times.

### **COMBINATION OF POSITIONAL RELEASE & TAPING TECHNIQUE:**

- The patient is in supine position.
- The scapula is elevated by taking the shoulder or scapula superior and medial to the ear, neck is rotated to the opposite side, extended and side bended to the same side.
- Fine tuning of the release was done through either neck or shoulder and this position was held for 90 seconds.
- After the release the patient was put back to the normal position. This procedure is also done for 5 times.

### **Taping Technique:**

- Patient sit in high sitting position
- Identify the upper trapezius muscle fiber
- Prepare the skin.
- The length of tape is 9-10 inch
- The width of tape is 1 inch
- Flex the patient's neck 45<sup>0</sup>
- Adhere base of tape to the skin just below the hair line. Apply the other end of the tape to the acromion while rotating the head towards the involved side.

## DATA ANALYSIS

For this study 30 patients were selected and all the patients completed the study. The patients were randomly assigned into 2 groups, Group A and Group B. Group A received MET and Group-B received combination of PRT& Taping technique. Both Groups got educational information about upper Trapezius spasm and general advices for postural care and methods of modifying risk factor.

Pain intensity were recorded with the use of VAS, ROM of cervical lateral flexion & rotation (specially opposite to involved muscle )measured by Goniometer and functional disability with the use of Vernon Neck Disability Index (NDI) at 1<sup>st</sup> day prior to treatment and at the end of 10<sup>th</sup> days of treatment.

Mean was calculated for the 1<sup>st</sup> day prior to treatment and at the end of 10day of treatment to see the average improvement in VAS, ROM and NDI in the two groups separately. Standard deviations were taken to see the variation from their means.

95% of confidence interval (mean  $\pm$  SD) was calculated to see the variation within the group from 1<sup>st</sup> day to 10<sup>th</sup> day and the end of 10<sup>th</sup> day between Group A and Group B.

Paired sample 't' tests were conducted to determine the significant difference before and after the intervention for both exercise groups and Independent sample 't' test/Fisher's 't' test were conducted to compare for group difference in pre- intervention. A value of  $p < 0.05$  was used as an indicator of statistical significance.

### MASTER CHART

#### GROUP-A (MET)

(n=15)

SI. No	VAS		ROM				NDI	
	1 <sup>st</sup> day	10 <sup>th</sup> Day	LATERAL FLEXION		ROTATION		1 <sup>st</sup> day	10 <sup>th</sup> Day
			1 <sup>st</sup> day	10 <sup>th</sup> Day	1 <sup>st</sup> day	10 <sup>th</sup> Day		
1	6.1	1.4	25(R)	40	20(R)	30	54	32
2	5.8	2	20(R)	38	24(R)	32	58	20
3	8.2	3.7	22(L)	37	20(L)	30	58	26
4	7.1	4	24(L)	40	25(L)	35	56	24
5	7.6	3.8	23(L)	40	20(L)	35	60	32
6	8.3	2.5	23(R)	43	30(R)	35	56	34
7	9.2	4.6	18(L)	38	22(L)	30	54	30
8	6.1	3.7	25(R)	34	28(R)	35	52	34
9	7.5	4.2	24(R)	39	26(R)	34	58	30

10	7.7	3.5	16(R)	44	19(R)	30	50	28
11	6.8	4.1	20(L)	40	24(L)	32	58	36
12	8.7	3.6	19(R)	39	25(R)	35	48	26
13	7.2	4.5	20(L)	37	15(L)	30	56	24
14	8.6	3.6	23(R)	45	28(R)	35	52	32
15	6.9	2	15(L)	39	22(L)	32	50	22

## MASTER CHART

### GROUP-B (PRT and Taping) (n=15)

Sl. No	VAS		ROM				NDI	
	1 <sup>st</sup> day	10 <sup>th</sup> Day	LATERAL FLEXION		ROTATION		1 <sup>st</sup> day	10 <sup>th</sup> Day
			1 <sup>st</sup> day	10 <sup>th</sup> Day	1 <sup>st</sup> day	10 <sup>th</sup> Day		
1	6.7	4.8	25(R)	40	25(R)	32	54	42
2	7.3	4.6	23(R)	38	20(R)	32	52	54
3	6.9	3.2	22(L)	32	26(L)	33	54	42
4	6.7	5.1	25(L)	40	18(L)	28	60	46
5	8.1	5.5	22(L)	38	20(L)	30	60	42
6	6.8	4.1	24(R)	41	22(R)	32	56	40
7	7.4	4.7	20(L)	35	21(L)	30	58	40
8	5.8	4.9	25(R)	34	23(R)	31	58	42
9	8.1	5.3	23(R)	39	19(L)	30	56	38
10	6.9	4.2	18(R)	40	24(R)	29	40	26
11	6.4	4.4	23(L)	33	19(L)	29	36	28
12	7.3	4.2	15(R)	29	26(R)	33	60	42
13	7.5	1.2	17(L)	34	25(L)	31	50	36
14	6.9	4.8	24(R)	42	27(R)	32	60	32
15	6.8	4.3	16(L)	32	20(L)	30	58	44

## RESULTS

Thirty subjects with neck pain due to UT spasm who participated in this study, none were lost to follow-up assessment. Baseline characteristics of pain (VAS) and cervical active ROM was not different between the

two interventions groups ( $P > 0.05$ ). In addition with, pre-intervention NDI score were also not significantly different between two intervention groups. All participants in the Group-A and Group-B received the full ten (10) treatment sessions. No patients reported adverse effects.

The reduction in pain intensity, improvement active ROM and NDI score described as the mean difference between the values obtained before and after treatment program. In Group-A the difference between the mean values of VAS before treatment ( $7.45 \pm 1.02$ ) and after treatment ( $3.41 \pm 0.97$ ) was highly significant ( $P = 4.01206 \times 10^{-10}$ ). In Group B the difference between mean value before treatment ( $7.04 \pm 0.60214$ ) and after treatment ( $4.3533 \pm 1.036$ ) was also significant ( $P = 5.22981 \times 10^{-07}$ ), but more as compare to Group A. Cervical mobility in frontal plane i.e. lateral flexion and horizontal plane i.e. rotations tended to increase in both groups after treatment program compare to before treatment values. Comparison between both groups revealed a statistically significant increase in Cervical AROM of frontal plane i.e. lateral flexion and horizontal plane i.e. rotations in Group A as compared to Group B. In Group A before treatment the mean lateral flexion and rotation was ( $20.46 \pm 3.73$ ) & ( $22.53 \pm 3.99$ ) respectively and after treatment the mean lateral flexion & rotation was ( $39.53 \pm 2.82$ ) & ( $32.66 \pm 2.26$ ) respectively whereas in Group B before treatment the mean lateral flexion & rotation was ( $21.466 \pm 3.41$ ) & ( $22.33 \pm 2.99$ ) respectively and after treatment the mean lateral flexion & rotation was ( $36.466 \pm 3.979$ ) & ( $30.8 \pm 1.52$ ) respectively. Along with this there was also significant difference between the mean value of NDI before treatment ( $54.66 \pm 3.59$ ) and after treatment ( $28.66 \pm 4.82$ ) in Group A ( $P = 5.2 \times 10^{-11}$ ) than Group B before treatment ( $54.13 \pm 7.26$ ) and after treatment ( $39.6 \pm 7.018$ ), ( $P = 4 \times 10^{-07}$ ).

## DISCUSSION

Neck pain is caused by UT spasm usually find in middle-aged patients. This pain usually responds to activity modification, neck mobilization, isometric exercises, and medication. Repeated occupational trauma mostly contributes to the development of UT spasm. An increased incidence has been noted in patients who are computer professional, bike rider, teacher etc.

The results of this comparative study were focused on pain, cervical AROM and functional disability (NDI) as outcome measures. It was noticed that there were recovery in all the above parameters. Both interventions resulted in reduced neck pain and improved cervical AROM (in lateral flexion rotation) in this short duration. A pre intervention statistical analysis showed there was no significant difference between the groups, in VAS, CAROM and NDI.

Compliance was good among the patients who completed intervention and all patients attended the follow-up. Although subjective compliance during intervention was higher in Group-A, than Group-B.

My study demonstrated a significant reduction of pain in group A and B. This was found in both the groups over 10 day of treatment with MET and PRT with Taping. When comparing the pre and post treatment, VAS score between the two groups, the Group A treatment showed much better improvement than the Group B treatment.

This is evident by the statistical results, where p value between the groups have consistently shown that subjects under Group A have produced better reduction in VAS score, and improvement in CAROM and NDI.

The study showed that improvement in active neck mobility was mainly occurring during the first 10<sup>th</sup> day of treatment period. This study also showed larger improvement of CAROM occurred (Group A) in lateral flexion and rotation after 10<sup>th</sup> day of treatment protocol. As neck pain reduces and CAROM increases, neck function also improves.

This study clearly demonstrated significant reduction in pain (VAS), (for group A, 7.45 to 3.41, and for group B, 7.04 to 4.35), cervical active range of motion (AROM), (for group A lateral flexion ROM, 21.13 to 39.53 and for group B 21.46 to 36.46, for group A rotation ROM, 23.2 to 32.66, and for group B rotation ROM, 22.33 to 30.8) and disability (NDI) (Group A 54.66% to 28.66% and Group B 54.13% to 39.6 %). The result showed that treatment given to group A is more significant in improving functional ability than treatment given to group B.

During the course of study it was also noted that patient's education about UT spasm and ergonomic advice for self-care and methods of modifying risk factors add more benefit in either of treatment groups. This may help the patients to understand more about their condition and may improve psychological well-being to carry out the activities.

The strength of this study were the standardized measure procedure, the use of reliable and valid outcome measures, the measurement was blinded to both group for the outcome assessment and statistical analyses, the attempt to follow a treatment guideline and the good compliance in the interventions. This study supports the validity of using MET technique as compare to PRT with Taping in UT spasm reduce pain, improve cervical AROM, and functions.

## CONCLUSION

From the study it was concluded that MET is effective in reducing neck pain improving cervical AROM and functional ability as compared to PRT with Taping over a period of 10 day of treatment in patients with UT spasm. However, both interventions appear to have a positive effect in pain reduction, AROM and functional ability improvement as short term treatment for UT spasm. As the differences of all outcome measures were greater for MET, it seems to be a favorable treatment option for patients with UT spasm.

## LIMITATIONS

Almost each and every study has some limitations and this study in its course has also come up with some limitations due to some unavoidable practical, socioeconomic and environmental factors.

Therefore it is suggested that the further studies can be done in this direction keeping some points in consideration as given below.

1. The duration and sample size of the study is small.
2. In this study Cervical AROM of frontal plane i.e. lateral flexion and horizontal plane i.e. rotations.
3. In this study I consider only unilateral spasm.

## RECOMMENDATIONS

The following recommendations are made to carry more fruitful study in future.

1. As the study was done in unilateral UT spasm, further studies on bilateral UT spasm can be considered.
2. Further study could be dedicated to other professional like Bike rider, IT professional.
3. Cervical AROM of sagittal plane i.e. flexion and extension were measured with frontal plane i.e. lateral flexion and horizontal plane i.e. rotations for further studies.

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