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The efficacy of muscle energy technique and integrated neuromuscular inhibition technique on upper trapezius trigger point release in subjects with non specific neck pain- a comparative study

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ABSTRACT

Background

There are many potential contributing factors to non-specific neck pain, one area that has received scientific emphasis is the trigger point (TrP). TrPs have the potential to create pain, limit ROM and hence should be treated effectively. There is a dearth of evidence regarding the integration of techniques like ischemic compression and SCS in individuals with non-specific neck pain. For this reason, the study was carried out to check the combined effect of these techniques in subjects on TrPs with Nonspecific neck pain.

Aim

To compare the effect of Muscle Energy Technique (MeT) and Integrated Neuromuscular Technique (INIT) on upper trapezius trigger points in subjects with non-specific neck pain.

Method

The study was carried over a period of 2 weeks with 30 samples selected on random basis. The subjects were randomly divided into two groups of fifteen each. Group A received muscle energy techniques while the Group B received an Integrated neuromuscular inhibition technique (INIT). Outcomes measures included a visual analog pain scale (VAS), cervical goniometer to measure the range of cervical lateral flexion (both sides) & cervical contralateral rotation range of motion (ROM) which were collected at baseline and 4weeks post therapy.

Result

Within group analysis was done using Paired t test & between group analysis was done using unpaired t test. Results revealed large pre-post-effect sizes within the INIT group. The two-tailed P value was <0.001 for both the outcome measures. Also, significantly greater improvements in lateral cervical flexion ROM & pain were detected in favor of the INIT group (P value < 0.05) at df =27).

Conclusion

The Integrated Neuromuscular Inhibition Technique (INIT) was more effective in relieving pain and improving cervical range of motion (cervical ipsilateral & contra lateral side flexion) as compared to the Muscle Energy Technique (METs).

Abbreviations: TrP- Trigger point; INIT- Integrated Neuromuscular Inhibition Technique; MET- Muscle Energy technique; SCS- Strain Counterstrain Technique; VAS – Visual Analogue scale; ROM-Range of motion

Keywords: Integrated neuromuscular inhibition technique, Ischemic compression, Muscle energy technique, Strain-counterstrain, Trigger points

INTRODUCTION

Neck pain is a common disorder with a reported 6 month prevalence rate of 54% [1, 10,11].In the majority of cases, the patho-anatomical source of an individual's pain cannot be identified and is therefore called as Nonspecific, primarily defined as non-articular & non systemic in nature [1, 10]. Although there are many potential contributing factors to non-specific neck pain, one area that has received scientific emphasis is the trigger point (which will be referred as TrP). Myofascial trigger points, are referred to as hyperirritable areas in the fascia surrounding skeletal muscle. They are associated with palpable nodules in taut bands of muscle fibers which lead to referred pain beyond the area of contact. Trp may refer pain both in the local area and/or to other areas of the body, and common patterns have been well-documented and diagramed. These are called "referral patterns". Although, the etiology of TrP development is currently unknown, recent studies have hypothesized that the pathogenesis results from the overloading and injury of muscle tissue, leading to involuntary shortening of localized fibers [20, 21].The areas of stressed soft tissue receive less oxygen, glucose, and nutrient delivery, and subsequently accumulate high levels of metabolic waste products. The end result of this cascade of events is the creation of altered tissue status, pain, and the development of TrPs [20, 21]. TrPs have been found to frequently occur in individuals with mechanical neck pain as compared to their age matched controls. TrPs have been associated with hyperalgesia and limited range of motion (ROM) and are therefore clinically important to identify as these possess the potential to restrict functional activities [16, 20, 21].

Identification is accomplished through the recognition of a pattern of clinical signs on physical examination. Signs that may include the

presence of a taut band in a skeletal muscle, the presence of a tender spot within the taut band, a palpable or visible local twitch response upon palpation, and/or needle inspection of the TrP (called a jump sign), the presence of a typical referred pain pattern, and restricted ROM of the affected tissues [6,8] TrPs have the potential to create pain, limit ROM and restrict functional activities and should therefore be addressed as part of a comprehensive physical therapy program [6, 8, 10].

A trigger point could be active one causing local tenderness and agonizing pain or a latent one producing painless restriction of movement and distortion of posture [2, 7].

From all the muscles of the upper limb the trapezius muscle (particularly the upper fibers of trapezius) is the most common to develop trigger points. The trapezius is a wide triangular muscle which has its attachment to the base of the skull, and lies at the back of the neck, over the upper shoulders and extends down your upper back to your mid back [1].The most vital reason for development of Trp over this muscle is the continuous stress that this muscle is subjected to while performing the upperlimb movements particularly the scapular and the neck movements. Symptoms particularly include severe neck pain a stiff neck, limited range-of-motion, intolerance to weight on your shoulders when particularly the upper fibers of trapezius muscle are involved [2, 3].

For the treatment of trigger point particularly involving the trapezius muscle, the Integrated Neuromuscular Inhibition Technique (which will be called as INIT from here on) has shown to be beneficial [1, 2, 3]. The technique involves the combined use of MET, ischemic compression and SCS (Strain Counter Strain technique) The INIT approach ensures for the application of all techniques in a single coordinated manner [24, 26]. The second technique which has shown to be

beneficial is Muscle energy technique (which will be called as MET from here on.) METs are a commonly utilized method for achieving tonus release (inhibition) in a muscle before stretching [24, 26]. The approach involves the introduction of an isometric contraction to the affected muscle producing post-isometric relaxation through the influence of the Golgi tendon organs (autogenic inhibition [23, 26]. Chaitow feels that the combination of MET, is chemic compression and SCS produces the most effective, targeted approach to TrP release [1]. This method is termed the integrated neuromuscular inhibition technique (INIT). He has suggested that the benefit of the technique lies in its multifaceted approach. The INIT approach allows for delivery of the techniques in a single coordinated manner. Although randomized clinical trials exist studying the efficacy of ischemic compression and SCS in neck pain and chronic myofascial pain syndromes, there is a lack of evidence regarding the integration of these techniques in individuals with non-specific neck pain [20]. For this reason, additional research examining the effectiveness of this regimen should be warranted. The purpose of this study was to compare the effect of two treatment approaches, MET, and the INIT, in deactivating upper trapezius TrPs as measured by an improvement in pain (VAS) and range of motion (ROM).

MATERIALS AND METHODS

- **Target Population** -Subjects with nonspecific neck pain between 18 to 55 years of age with presence of upper trapezius active trigger point.
- **Study Setting** –MVP multispeciality hospital physiotherapy OPD, Nashik.
- **Method of sampling**- Convenient sampling
- **Research Design**- Comparative experimental study
- **Sample Size**- 30 subjects
 - Group A: 15 subjects
 - Group B: 15 subjects
- **Duration of Study**- 6 months

INCLUSION CRITERIA

- Subjects suffering from non-specific neck pain, defined as non-articular or non-systemic.
- Subjects between 18 and 55 years of age.

- Subjects to have nonspecific neck pain of less than 3 months duration as well as active trigger point (TrPs) in the upper trapezius muscle, defined as a tender nodule in a taut band that referred pain beyond the area of contact.
- Either unilateral or bilateral trapezius trigger point

EXCLUSION CRITERIA

- Subjects with any pathological neck conditions. Subjects who have neck symptoms related to a motor vehicle collision or significant trauma.
- Serious pathology (e.g. malignancy, infection, inflammatory disorder, or fracture).
- Subjects with signs of cervical spinal cord compromise (e.g. diffuse sensory abnormality, diffuse weakness, hyperreflexia, or the presence of clonus).
- Two or more signs of nerve root involvement (e.g. dermatomal sensation changes, myotome weakness, or diminished/absent tendon jerk reflexes)
- History of neck surgery during the previous 12 months.
- Any degenerative condition of the cervical spine as per radiographs.
- Endocrine Disorders, and autoimmune conditions (e.g. rheumatoid arthritis, fibromyalgia).

OUTCOME MEASURES

1. Visual analogue scale (VAS) -The visual analogue scale was used to establish subject's pain level. The subjects were asked to mark on a 100-mm line between 2 extremes i.e. 0 and 10. For pain intensity, the subjects were then asked to rate their pain intensity during activities or immediately after activities on the VAS, with 0 representing no pain and 10 representing worst pain ("as much pain as one can possibly imagine").
2. Cervical goniometer-Cervical goniometer is a reliable instrument to measure the range of cervical lateral flexion on both sides & cervical rotation on opposite side.

MATERIALS

- Assessment chart
- Patient consent form
- Paper and pen
- Couch for subject to perform MET and INIT techniques respectively.
- Cervical goniometer to measure the range of cervical lateral flexion & cervical rotation.

DISTRIBUTION OF SUBJECTS

The study procedure was conducted by assessing the subject's initial recording and final recording. The patients were chosen according to inclusion and exclusion criteria. All the patients were divided into two groups group A and group B. Group A received Muscle energy technique (MET) and group B received Integrated Neuromuscular Inhibitory technique (INIT)

PROCEDURE

A comparative experimental study was conducted MVP College, hospital and research center, Nashik, India. After obtaining an informed consent, subjects diagnosed with nonspecific neck pain were randomly divided in two groups of 15 each and were assigned to group A (MET) & group B (INIT) respectively as and how they came to Physiotherapy OPD. Prior to the treatment, subjects were advised to grade their pain intensity using a visual analog scale (VAS).Cervical lateral flexion motion was assessed using a cervical range of

motion (CROM) goniometer. Subjects were asked to sit upright and laterally flex their head towards one side. The motion was stopped once the available ROM was completed and care was taken to disallow shoulder elevation. Once the degree of lateral flexion was recorded, the motion was repeated towards the opposite side. Similarly, Cervical rotation on the contralateral side was measured. Both the outcome measures were taken at baseline (pre-Rx) and at the end of 2 weeks after the treatment [1].

Group A: Subjects receiving MET technique

Subjects confined to the MET group received treatment as per Lewit's post-isometric relaxation approach [23].The subjects were placed in supine and the shoulder on the affected side was stabilized with one hand, while the ear/mastoid area of the affected side was held by the opposite hand. The head and neck was then side bent towards the contralateral side, flexed, and rotated ipsilaterally, placing the subject just short of their upper trapezius restriction Barrier. The subjects then shrugged the involved/stabilized shoulder towards the ear at a submaximal, pain-free, effort (20% of their available strength). The isometric effort was held for 7–10 s while a normal breathing rhythm was maintained. During the relaxation phase, the head and neck were eased into increasing degrees of side bending, flexion and rotation to advance the stretch placed on the muscle. Each stretch was held for 30 s, and this was repeated for three to five repetitions per session [24, 26].

Figure 1-Subjects Receiving MET



Group B Subjects receiving INIT

As the primary focus of the INIT approach is to deactivate specific TrPs, the practitioners first identified the TrPs to be treated within the upper trapezius Muscle [24, 26]. Their arm was positioned in slight shoulder abduction with the elbow bent and their hand resting on their stomach. Using a pincer grasp, the practitioner moved throughout the fibers of the upper trapezius and made note of any active TrPs. The first technique applied was ischemic compression. The therapist

again utilized a pincer grasp, placing the thumb and index finger over the active TrP [5,17,18]. Slow, increasing levels of pressure were applied until the tissue resistance barrier was identified. Pressure was again applied until a new barrier was obtained. Pressure was maintained until a release of the tissue barrier was felt until the time when pressure was unable to be identified or 90 seconds had elapsed, whichever came first. All identified TrPs were treated [24, 26].



Figure 2-Subjects Receiving Ischaemic Compression in INIT Approach

Ischemic compression was followed by the application of SCS [1]. Moderate digital pressure was applied to the identified TrP as subjects rated their level of pain on a scale from 1 to 10 [12, 13]. If pain was unable to be identified, pressure was increased. If pain was reproduced, the pressure was

maintained over the active TrP as the position of ease was identified. The position of ease was often produced through positioning the muscle in a shortened/relaxed position. Once the position of ease was identified, it was held for 20–30 s and repeated for three to five repetitions [12, 19].



Figure 3-Subject Receiving Strain Counter Strain Technique (SCS) in INIT Approach

- Lastly, the subjects received MET directed towards the involved upper trapezius. Each isometric contraction was held for 7–10 s and was followed by further contralateral side bending, flexion, and ipsilateral rotation to maintain the soft tissue stretch. Each stretch was held for 30 seconds and was repeated three to five times per treatment session [1, 4, 5].
- Post which, the subjects were given conventional exercises and ergonomic advices

which were common to both groups and pain relief modality as TENS.

Conventional exercise protocol common to both groups

Transcutaneous electrical nerve stimulation (TENS)

- Therapeutic frequency-100hertz
- Mode-conventional mode
- Duration-10minutes



Figure 4-Subject receiving Transcutaneous Electrical Nerve Stimulation (TENS)

1. Precautions and Ergonomic advices were explained to the subjects
2. Neck exercises – Affected side trapezius stretching with 15 second for hold 3sets of 10 repetitions each, All Neck Rom exercises for 3 sets of 10 repetitions each.



Figure 5-Subjects Receiving Trapezius Stretching of the Affected Side

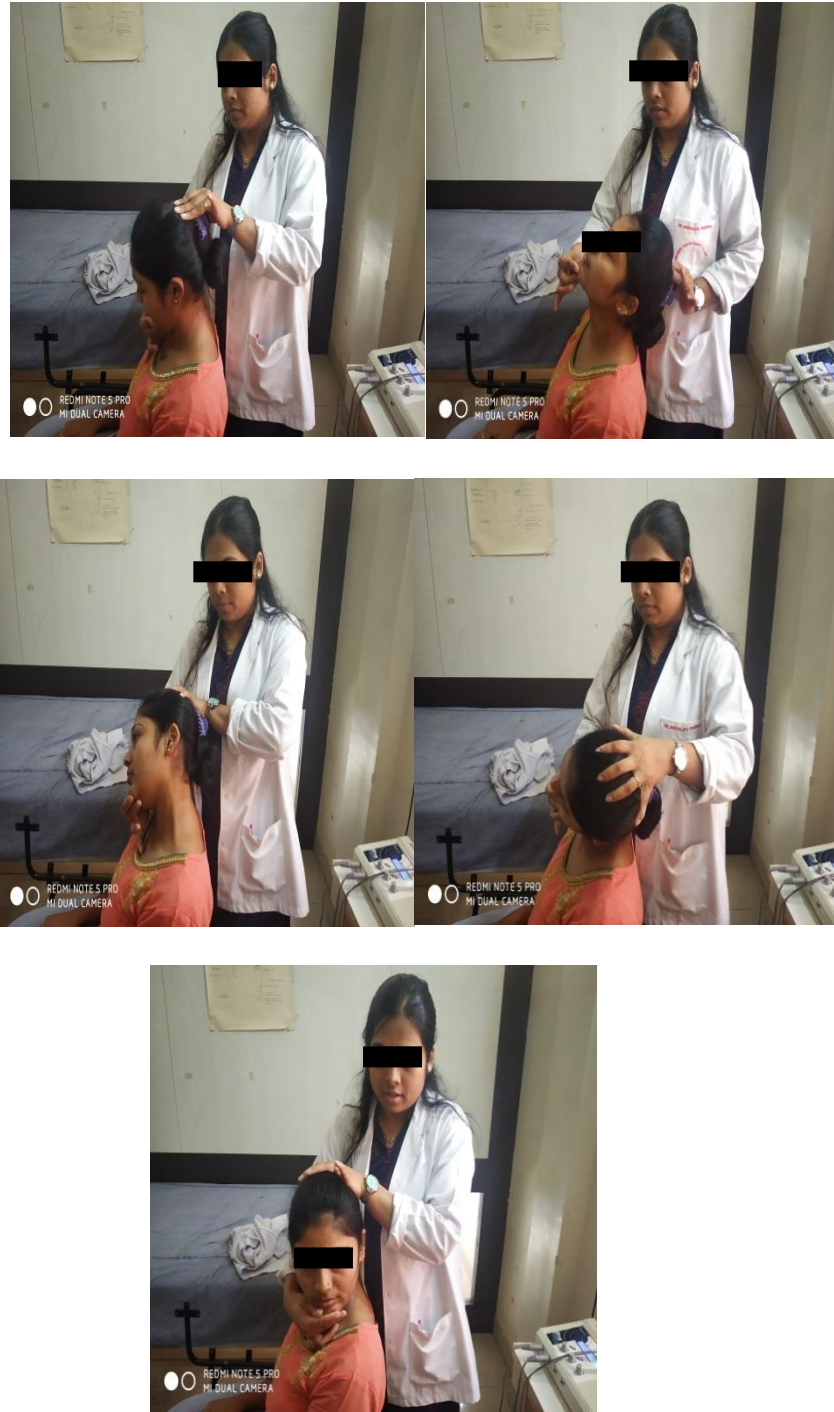
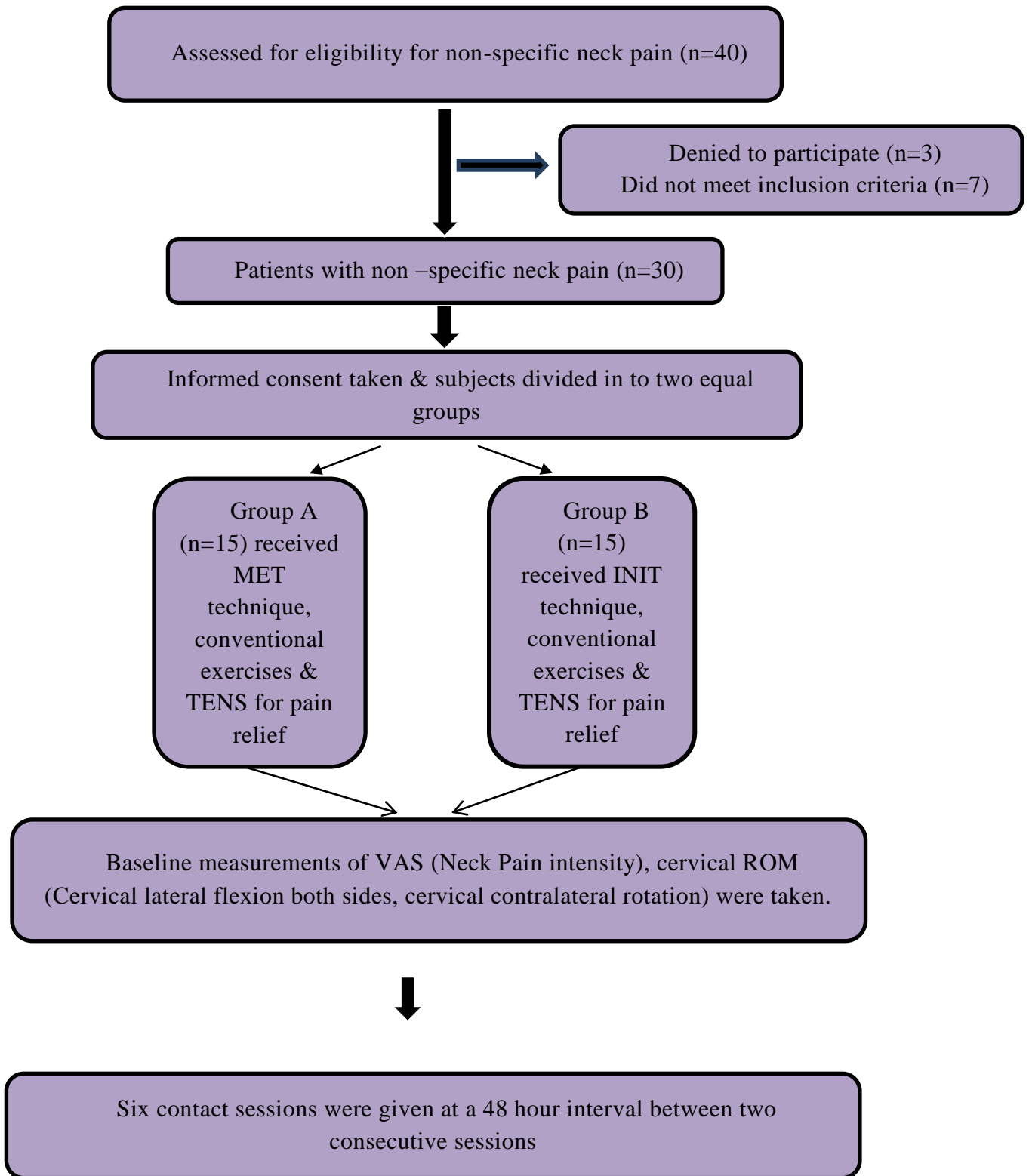


Figure 6-Subject Receiving Neck ROM Exercises (Cervical Flexion,Extension, Lateral Flexion And Rotation Respectively)

Procedure Flowchart



RESULT

Forty subjects were screened for eligibility in the study. Out of which 3 subjects disagreed to participate in the study while 7 subjects could not fulfill the inclusion criteria. Hence a total of 30 subjects who agreed and fulfilled the inclusion

criteria were chosen for the study. They were equally divided in to two groups of 15 each. All 30 subjects finished the study & were selected for analysis. Statistical significance was assessed by PAIRED-T TEST within the groups.

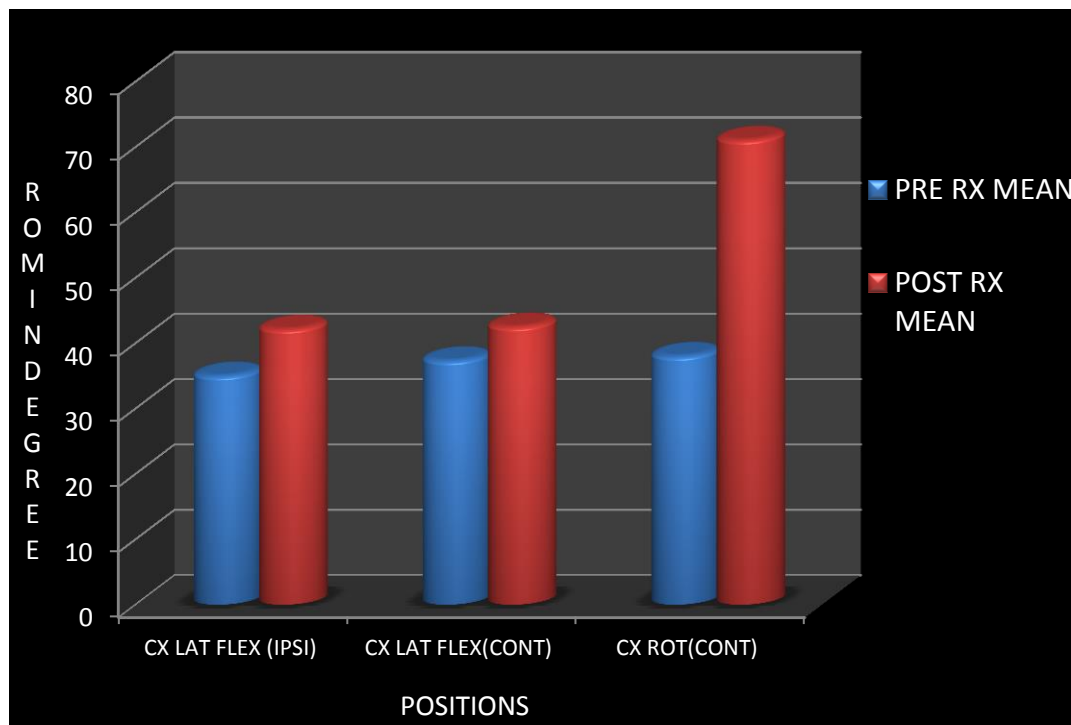
Table 1- Pre & Post treatment result in the ROM & VAS scores after employing MET & INIT techniques respectively

| Technique used | PRE RX | | POST RX | | T VALUE | P VALUE |
|-------------------------|--------|------|---------|------|---------|---------|
| | MEAN | SD | MEAN | SD | | |
| MET | | | | | | |
| CX LAT FLEX (IPSI) SIDE | 35 | 4.23 | 42.14 | 2.57 | 10.21 | 0.0001 |
| CX LAT FLEX(CONT) SIDE | 37.33 | 4.95 | 42.50 | 2.59 | 5.64 | 0.0001 |
| CX ROT(CONT) SIDE | 38 | 7.51 | 71.07 | 6.56 | 19.45 | 0.0001 |
| VAS | 6.33 | 1.11 | 1.14 | 1.10 | 11.45 | 0.0001 |
| INIT | | | | | | |
| CX LAT FLEX(IPSI) | 32.33 | 5.30 | 43.21 | 2.49 | 8.44 | 0.0001 |
| CX LAT FLEX(CONT) | 35.33 | 5.16 | 43.93 | 2.13 | 6.097 | 0.0001 |
| CX ROT (CONT) | 40.67 | 7.99 | 77.86 | 4.26 | 15.15 | 0.0001 |
| VAS | 6.33 | 0.90 | 0.43 | 0.76 | 22.44 | 0.0001 |

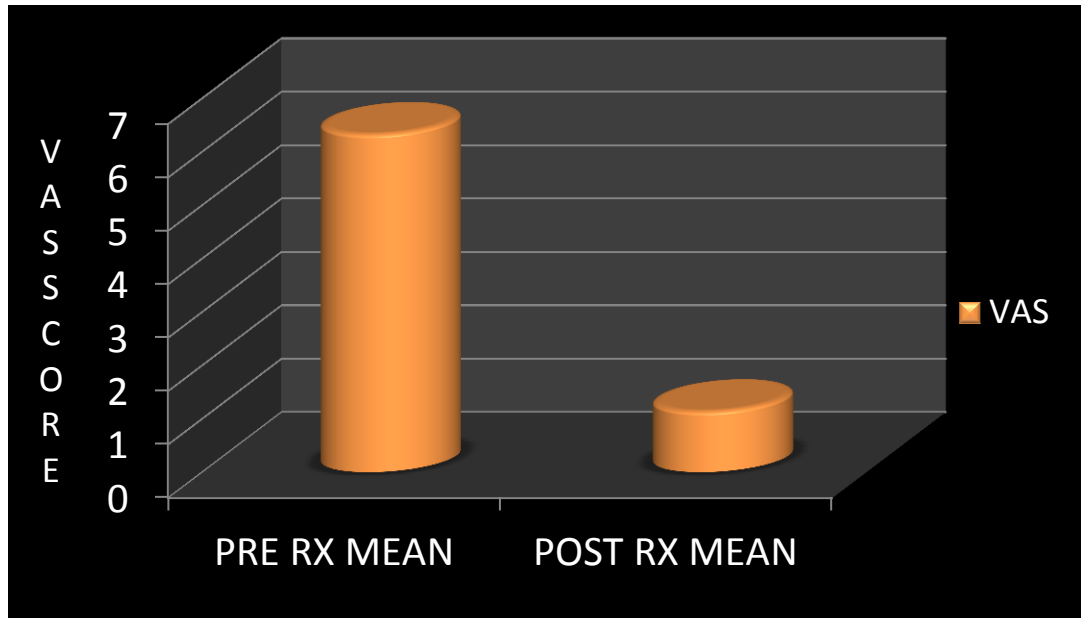
➤ The two-tailed P value is less than 0.001 for all the 3 data collected in both the groups (MET & INIT) respectively. By conventional

criteria this difference is considered to be statistically significant.

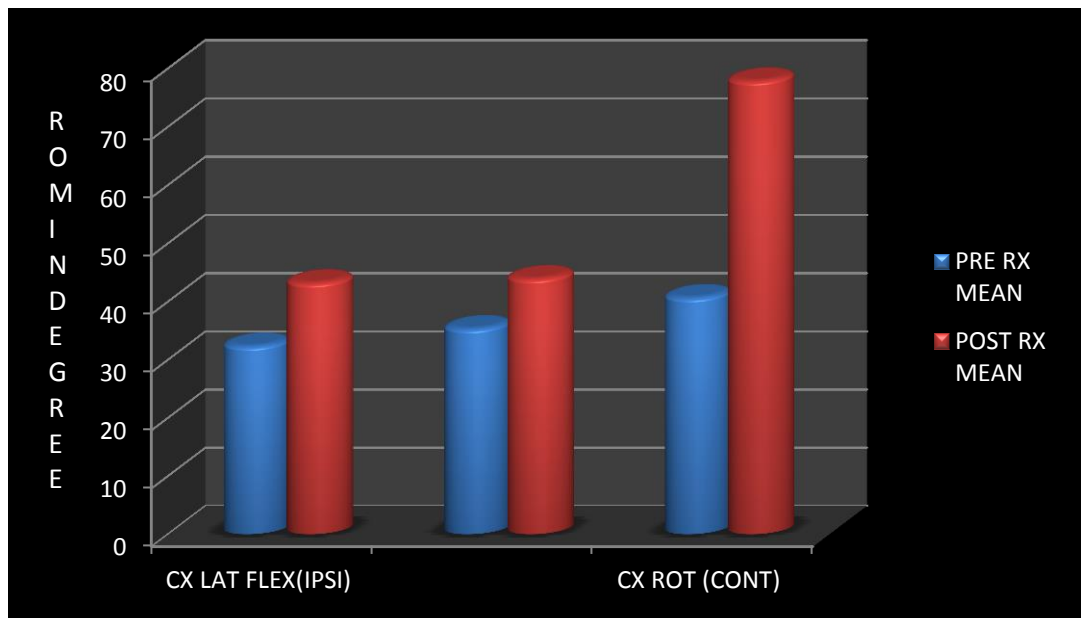
➤ The following is the graphical representation of the data



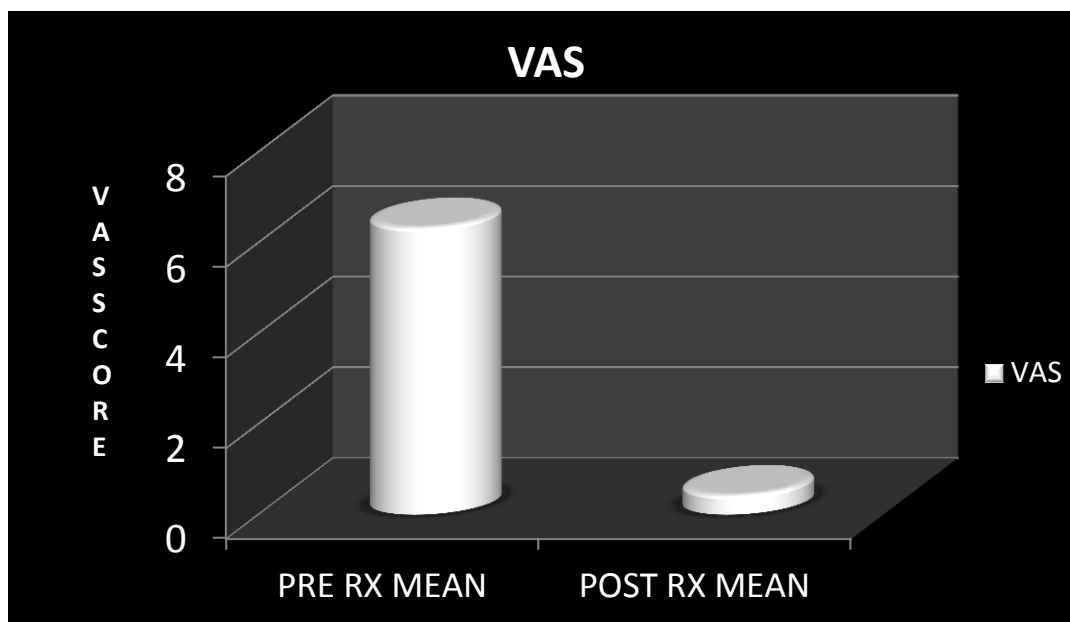
Graph 1-Pre & Post treatment comparison of ROM mean score after employing Met technique



Graph 2-Pre & Post treatment comparison of VAS mean score after employing MET technique



Graph 3-Pre & Post treatment comparison of ROM mean score after employing INIT technique



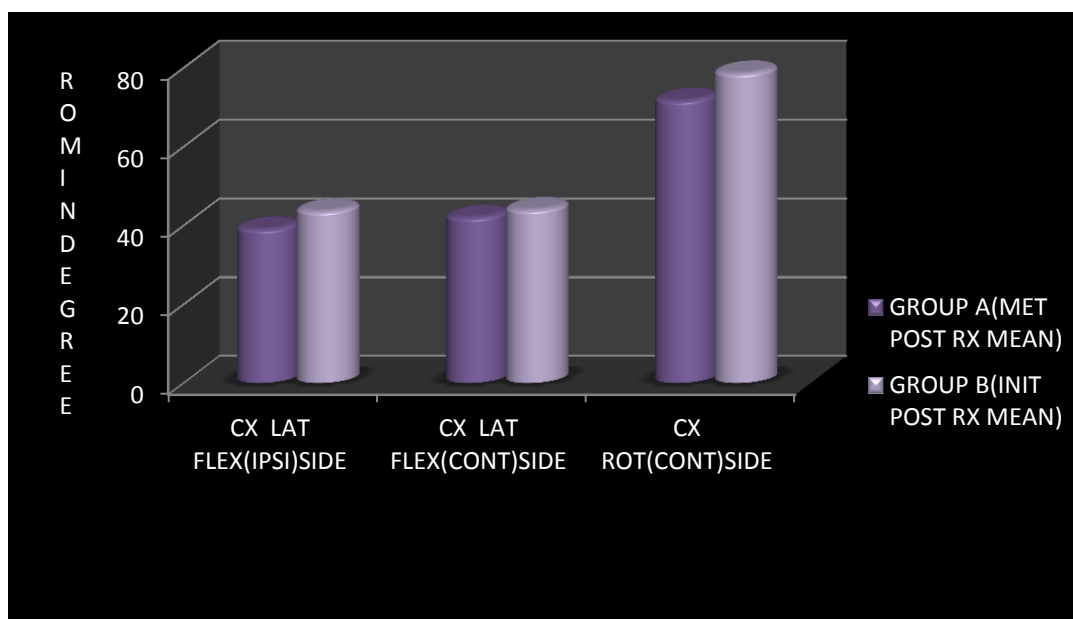
Graph 4 - Pre & Post treatment comparison of VAS mean score after employing INIT technique

Unpaired t test was used for between group comparisons i.e (MET v/s INIT)

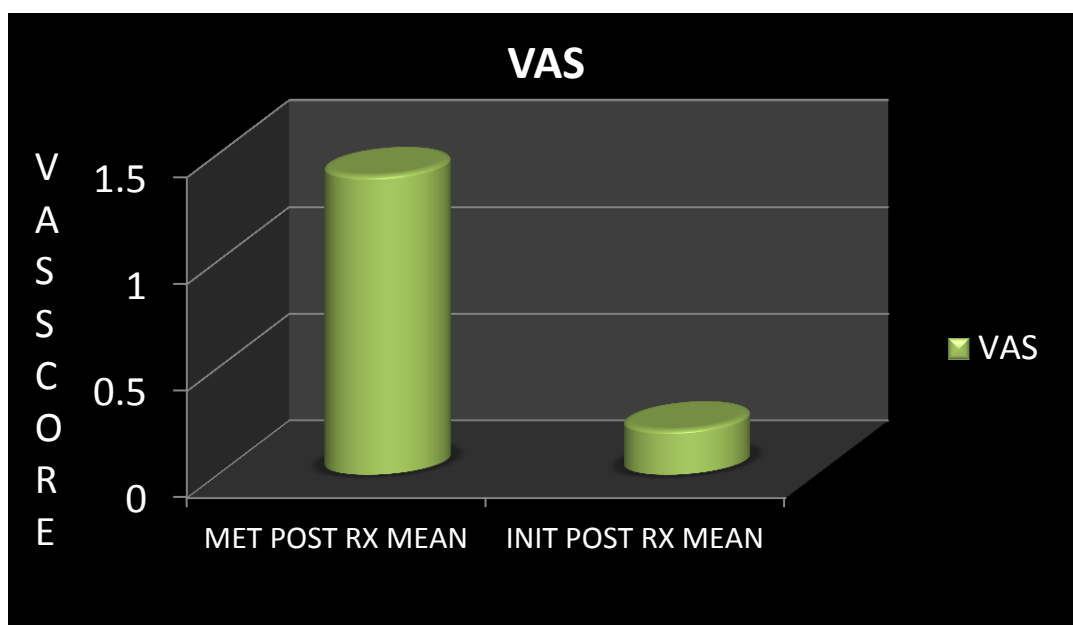
Table 2-Post treatment comparison of ROM mean score between the two groups

| | Group A(met)post RX | | Group B(Init)post RX | | T-value | P value |
|-----------------------|---------------------|------|----------------------|------|---------|---------|
| | Mean | SD | Mean | SD | | |
| CX LAT FLEX(IPSI)SIDE | 39 | 4.31 | 43.57 | 2.34 | 3.511 | 0.0016 |
| CX LAT FLEX(CONT)SIDE | 42 | 3.16 | 43.93 | 2.13 | 1.912 | 0.066 |
| CX ROT(CONT)SIDE | 71.67 | 6.73 | 78.57 | 3.63 | 3.403 | 0.0021 |
| VAS | 1.40 | 1.18 | 0.21 | 0.43 | 3.538 | 0.0015 |

- The t value obtained for post Rx comparisons between Met and INIT group for cervical lateral flexion (ipsilateral) side was $t=3.51, p=0.0016 (p<0.05)$ which is highly statistically significant.
- The t value obtained for post Rx comparisons between Met and INIT group for cervical lateral flexion (contralateral) side was $t=1.91, p=0.066 (p>0.05)$ which is not statistically significant.
- The t value obtained for post Rx comparisons between Met and INIT group for cervical rotation (contralateral) side was $t=3.40, p=0.0021 (i.e p<0.005)$ which was very significant.
- The t value obtained for post Rx comparisons of VAS between Met and INIT group was $t=3.53, p=0.0015 (i.e p<0.005)$ which was very significant.



Graph 5- Post treatment mean comparison of ROM between the groups (MET V/S INIT)



Graph 6-Post treatment mean comparison of VAS between the groups (MET V/S INIT)

Table 3-Comparison of the mean of the difference between post and pre-treatment intervention changes in Cervical ROM (ipsilateral, contralateral side flexion, cervical contralateral rotation)&VAS between the groups

| Category ROM | Group A(MET) (Post Rx – Pre Rx) Mean with SD | Group B(INIT) (Post Rx – Pre Rx) Mean with SD |
|-------------------------------------|--|---|
| Cervical lateral flexion (ipsilat) | 5.33+-1.29 | 11.79+-6.08 |
| Cervical lateral flexion (cont.lat) | 4.67+-2.97 | 7.86+-4.69 |
| Cervical rotation(cont.lat) | 37.6+-6.40 | 38.00+-8.62 |
| VAS | 6.93+-1.67 | 4.07+-1.14 |

Interpretation for Rom-cervical lat flexion (ipsilat)side

P value =0.0004
T value=4.02@df=27

The two tailed P value is equal to 0.0004 which is $p < 0.05$ hence by conventional criteria this difference is considered to be statistically significant.

Cervical lat flexion (contralat) side

P value=0.0361, t value=2.20 @df=27.

The two tailed P value is equal to 0.0361 which is $p < 0.05$ hence by conventional criteria this difference is considered to be statistically significant.

Cervical rotation (contralat) side

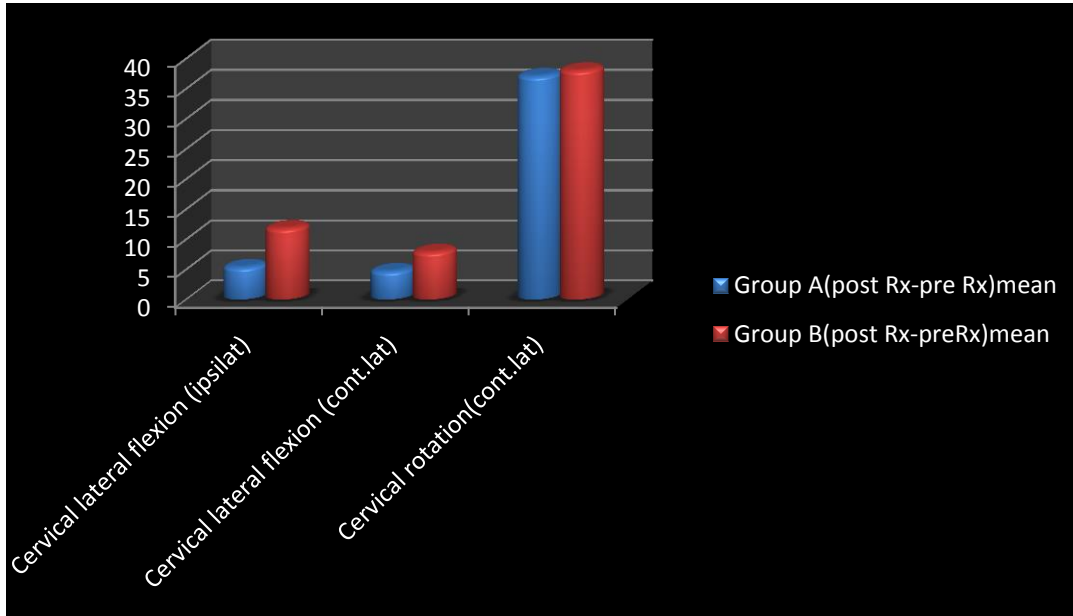
P value=0.12,tvalue=1.563@df=27

The two tailed P value is equal to 0.12 which is $p > 0.01$ hence by conventional criteria this difference is not considered to be statistically significant.

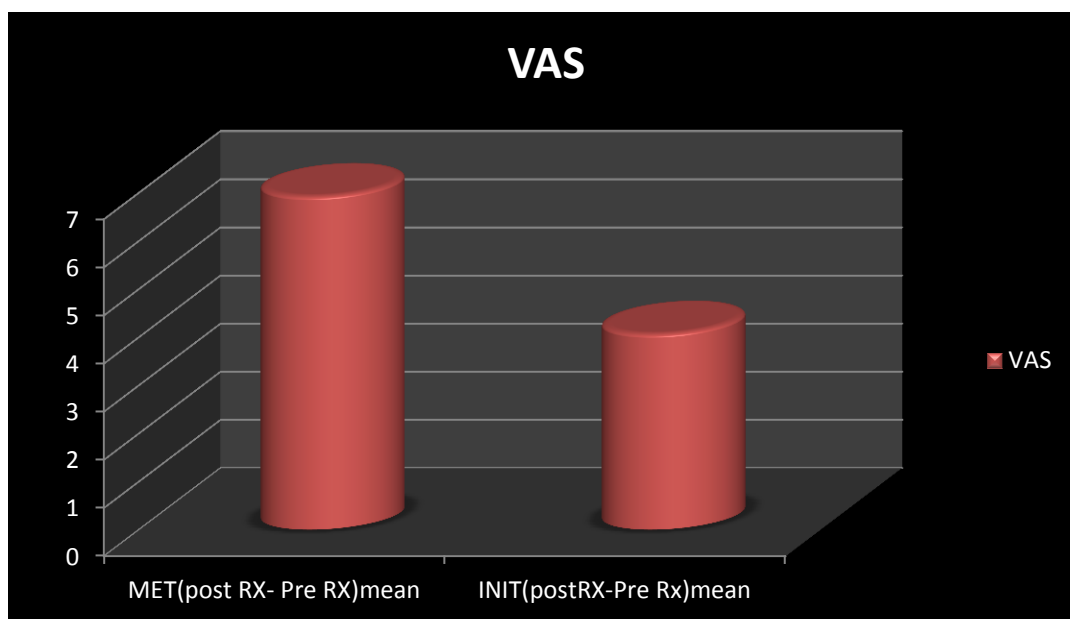
Interpretation for VAS- P-value=0.0425,t value=2.12,df=27

The two tailed P value is equal to 0.0425 which is $p < 0.05$ hence by conventional criteria this difference is considered to be statistically significant.

Graph 7- Comparison of mean of the difference between pre and post treatment intervention changes in Cervical rom (ipsilateral, contralateral side flexion, cervical contralateral rotation)- between the groups-



Graph 7- Comparison of mean of the difference between Post & Pre-treatment intervention changes in ROM between the groups



Graph 8-Comparison of mean of the difference between Post & Pre-treatment intervention changes in VAS between the groups

Result Interpretation

- The ROM cervical lateral flexion (ipsi& cont.), cervical rotation (cont.) and VAS before and after MET & INIT treatment were compared by the paired sample t-test.
- As $P < 0.0001$ for pre-treatment & post treatment ROM as well as VAS comparisons in Group A, result is highly statistically significant that is MET technique was effective on deactivating upper trapezius trigger points in subjects with non-specific neck pain.
- As $P < 0.0001$ for pre-treatment & post treatment ROM & VAS comparisons in Group B, result is highly statistically significant that is INIT was effective on deactivating upper trapezius trigger points in subjects with non-specific neck pain.
- As $P \text{ value} < 0.05$, the difference between the means of cervical ROM (cervical lateral flexion (ipsilateral & contralateral side) between the groups was statistically significant. Also the mean of the difference of (post RX-pre RX) interventions for cervical ROM (cervical ipsilat & contralateral flexion) was obtained significantly higher for the INIT group as compared to the MET group, hence INIT approach was more effective in increasing Cervical ROM than MET.
- As the $P \text{ value} > 0.05$, the difference between the means of cervical contralateral rotation between the groups was not considered statistically significant, hence both INIT and MET approaches were equally effective in increasing cervical contra lateral rotation ROM.
- As $P \text{ value} < 0.05$, the difference between the means of VAS between the groups was statistically significant. Also the mean of the difference of (post RX-pre RX) interventions for VAS was obtained significantly higher for the INIT group as compared to the MET group, hence INIT approach was more effective in reducing pain as compared to MET.

DISCUSSION

Physiological Rationale

- The purpose of our study was to determine the effect of MET and INIT, in deactivating upper trapezius trigger points as measured by an improvement in pain and ROM. The results indicate that the Integrated Neuromuscular Inhibition Technique (INIT) was more effective in relieving pain and improving cervical range of motion (cervical ipsilateral & contra lateral side flexion) as compared to the Muscle Energy

Technique(METs) and the Integrated Neuromuscular Inhibition Technique(INIT) and Muscle energy Technique(MET) were equally effective in increasing cervical contra lateral rotation range of motion.

- [5,19] Chaitow et al, proposed that the INIT approach which involves the combination of MET, Ischemic compression & Strain counterstrain (SCS) produces the most effective approach to Trp release. The INIT proves beneficial in reducing pain, stiffness, Range of motion and functional ability as compared to MET alone. The INIT approach involves the delivery of all the techniques in a single co-ordinated manner. The first technique used in the approach is the MET. [23,24] METs are a commonly utilized method for achieving tonus release (inhibition)in a muscle before stretching. The approach includes the application of an isometric contraction to the target affected muscle, thus producing post-isometric relaxation by the influence of the Golgi tendon organs (autogenic inhibition) [3]. Fryer and Fossum have postulated that the sequence of muscle and joint mechanoreceptor activation ensures firing of local somatic efferents. This in return leads to sympatho-excitation and activation of the periaqueductal gray matter, which plays a role in the descending modulation of pain [24,26]. Owing to stimulation of mechanoreceptors, simultaneous gating of the nociceptive impulses takes place in the dorsal horn of the spinal cord [7, 8]. Along with MET, ischaemic compression application to patients in INIT group has proved to be effective.It involves applying direct sustained digital pressure to the TrP with sufficient force over dedicated time duration, to slow down the blood supply and relieve the tension within the involved muscle. The pressure is gradually applied, maintained and the gradually released [21]. According to Travell, ischemic compression decreases the sensitivity of painful nodules in muscle. Simons proposed that local pressure may equalize the length of sarcomeres in the involved TrP and consequently decrease the pain. The sustained pressure applied to the TrP slows

down the blood supply and relieves the tension within the involved muscle [15, 19]. Another proposed mechanism for the benefit of ischemic compression was explained by Hou et al. Hou and colleagues, who suggested that pain and muscle spasm relief from direct digital pressure may result from the reactive hyperaemia produced in the area, or from the spinal reflex mechanism [9, 14, 21].

- SCS (strain counterstrain) [18, 21] technique is the third technique utilised in the INIT approach for the treatment of TrPs [23, 24]. This approach involves identification of the active TrPs, followed by the applying a pressure till a nociceptive response is elicited. The area is then positioned in such a manner as to reduce the tension in the affected muscle and subsequently the pain in the TrP. When the position of ease/pain reduction is achieved, the soft tissues which are under stress are are felt to be at their most relaxed and a local reduction of tone is produced [5, 18, 24]. Additionally, the subsequent tissue relaxation created by attaining a position of TrP ease (SCS) has been proposed as a mechanism of facilitating ‘unopposed arterial filling’ which allows for a reduction of tone in the tissues involved. This reduction in local tone further results in modification of neural reporting and improved local circulation [18]. These changes ultimately facilitate a resetting of the neural reporting structures, resulting in a more normal resting length, enhanced circulation, and decreased pain at the TRP.
- Thus the multifaceted Integrated Neuromuscular Inhibition approach (INIT) was considered to be more effective in relieving pain, reducing stiffness, and improving range of motion as compared to METs in isolation on upper trapezius trigger points in subjects with nonspecific neck pain.

CONCLUSION

The study concluded that

The Integrated Neuromuscular Inhibition Technique (INIT) was more effective in relieving pain and improving cervical range of motion

(cervical ipsilateral & contra lateral side flexion) as compared to the Muscle Energy Technique (METs).

LIMITATIONS

- The study had smaller sample size.
- The study was not gender specific.
- Occupation of a patient was not considered for the treatment.
- Small study duration
- The INIT group received a multimodal approach as compared to other group who received MET only.
- Generalizability of the findings is limited by the short-term follow-up used in this study and a longer period of follow-up is recommended to determine the lasting effects of this Approach.
- Furthermore, a cross over study could be conducted to check the effects of the two techniques on both groups.

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SUGGESTION

- Population can be gender specific.
- The study should be done on larger number of subjects.
- Occupation specific advices and treatment could be administered.
- Study duration can be increased.
- A control group can be included in the study.
- Assessment of functional status of an individual should be included in the study.

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