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## Immediate effect of myofascial release technique and strain counterstrain technique on unilateral trapezitis in sitting job professionals

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### Abstract

**Context:** Work-related neck pain is a common problem in office workers, especially among those who are intensive computer users with long-duration sitting job. Neck pain is thought to be complex. It is most commonly caused by putting an excessive amount of stress or strain over the trapezius muscle. The upper trapezius muscle is designated as postural muscle and it is susceptible to overuse. Trapeziitis is an inflammatory pain arising from the trapezius muscle causing a severe neck spasm. Myofascial trigger points (MTrP) are defined as hyperirritable spots within taut bands of skeletal muscle fibers. The syndrome is associated with tenderness in the muscle, characteristic referred pain, spasm and restriction in motion. Physiotherapy techniques like Myofascial release technique and Strain counterstrain technique to treat trapeziitis. Physiotherapy techniques like Myofascial release technique and Strain counterstrain technique to treat trapeziitis.

**Objectives:** To compare the immediate effect of MFR and SCS technique on Pain, Cervical lateral flexion in sitting job professionals on unilateral trapezitis.

**Study Design:** Comparative study.

**Method:** 60 subjects were selected fulfilling inclusion and exclusion criteria and were randomly divided into 2 groups. Group A receiving Myofascial release technique and Group B receiving Strain counterstrain technique.

**Results:** Statistic analysis was done by using SPSS software version 20.0. Wilcoxon signed-rank test was used for the pre-treatment and post-treatment comparison within both the groups & Mann-Whitney U test was used for the intergroup comparison the study showed that there was a significant difference between pre and post-treatment within each group A and B in pain intensity level and improvement in cervical range of motion. There was no statistically significant difference between group A and B in pain intensity level and cervical range of motion.

**Keywords:** Trapeziitis, Trigger points, (MFR) Myofascial release, (SCS) Strain counterstrain, NPRS (Numeric pain rating scale), Cervical ROM

### 1. Introduction

Trapezius is a large paired surface that originates from the external occipital protuberance, superior nuchal line, ligamentum nuchae and spinous process of C7-T12 vertebrae. It inserts on lateral third of the clavicle, acromion, and spine of the scapula. The muscle lies at the back of the neck and helps in the shrugging movement of the shoulders along with the upward movement of the head<sup>[1]</sup>.

Trapeziitis is an inflammatory pain arising from the trapezius muscle causing a severe neck spasm. It is most commonly caused by putting an excessive amount of stress or strain over the trapezius muscle. The upper trapezius muscle is designated as postural muscle and it is susceptible to overuse. Trapezius muscle helps with the function of neck rotation, side bending, and extension. Tightness in these muscles can decrease the range of motion of the neck. The decrease in range of motion can negatively affect the mobility of cervical joints. Limited range of motion creates an increase in soft tissue tightness, with an ensuing pain-spasm cycle which can be difficult to break<sup>[2]</sup>.

Neck pain is a common problem that affects almost one-third of the population with a point prevalence between 10-15%<sup>[11]</sup>. Work-related neck pain is a common problem in office workers, especially among those who are intensive computer users with long-duration sitting

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Jobs. Prolonged computer use can cause stress and strain on the musculoskeletal structures of the neck and upper extremity due to repetitive work and non-neutral work postures.<sup>[3]</sup> Neck muscles show a strong tendency to develop hyper tonus and spasm working postures with the neck in extreme flexion increase the load movement three to four times on neck causing muscle spasm of the neck muscles. Muscle spasm may be defined as contraction of the striated muscle that cannot be released voluntarily<sup>[4]</sup>.

Simons et al. (1998) and Travel and Simons (1992). Classically defines trigger points as the presence of exquisite tenderness at a nodule in a palpable taut band (of muscle). Trigger points can produce referred pain, either spontaneously or on digital compression. The clinical definition came to be that trigger points are localized areas of deep tenderness within a taut band of muscle. They exhibit a local twitch response or jump sign in response to digital pressure<sup>[5]</sup>. Clinically TrPs are classified as Active TrPs, usually the pain that the patient recognizes when the TrP is digitally compressed<sup>[6]</sup>. Present with spontaneous pain at rest and is responsible for the presenting pain complaint<sup>[5]</sup>. Latent TrPs, patient can feel pain only on the application of external pressure<sup>[5]</sup>, they do not produce spontaneous pain and produces increase muscle tension and muscle shortening.

Taut bands – These can be found by gently rubbing across the direction of the muscle fibers of a superficial muscle. They can snapped or rolled under the finger inaccessible muscle<sup>[6]</sup>.

Myofascial release technique (MFR) is a safe and very effective hands-on technique that involves applying gentle sustained pressure into the myofascial connective tissue restriction to eliminate pain and restore motion. By MFR there is a change in the viscosity of the ground substance to a more fluid state which eliminates the fascia's excessive pressure on the pain-sensitive structure and restores proper alignment. This technique acts as a catalyst in the reduction of the trapezius spasm<sup>[7]</sup>.

Strain counterstrain (SCS) is the fourth most commonly used osteopathic manipulative technique following soft tissue techniques, high-velocity low amplitude thrust and muscle energy technique (Johnson and Kurtz 2003). Also known as positional release, SCS is a passive positional technique aimed at relieving musculoskeletal pain and dysfunction through indirect manual manipulation (d'Ambrogio and Roth, 1997).

The most severe tender point are found, they are palpated, as a guide to find the position of comfort (POC). The POC produces optimal relaxation of the involved tissue and therefore theory holds that by placing the involved tissue in an ideal POC, it reduces the hyper irritation of tender points and normalizes the tissue, thereby relaxes and arrest the inappropriate proprioceptive activity<sup>[8]</sup>.

SCS is an aberrant neuromuscular activity between muscle agonist and antagonist, known as the Proprioceptive theory, it rapid stretching injury muscle spindles causing reflexive agonist muscle contraction and that resists further stretching. However, a reflexive counter-contraction resulting from pain induces withdrawal quickly reverses the aggravating movement thereby exiting agonist spindles<sup>[13]</sup>.

## 2. Objectives

### Primary

To compare the immediate effect of Myofascial release technique and Strain counterstrain technique on Pain,

Cervical lateral flexion in sitting job professionals on unilateral trapezitis.

### Secondary

1. To assess the immediate effect of Myofascial release technique on Pain, Cervical lateral flexion in sitting job professionals on unilateral trapezitis.
2. To assess the immediate effect of Strain counterstrain technique on Pain, Cervical lateral flexion in sitting job professionals on unilateral trapezitis.
3. To compare the results of both the techniques on Pain, Cervical lateral flexion in sitting job professionals on unilateral trapezitis.

## 3. Hypothesis

### Null hypothesis

HO: There is no difference between the immediate effects of the Myofascial release technique and the Strain counterstrain technique on unilateral trapezitis in sitting job professionals.

### Alternate hypothesis

H1: Myofascial release technique is more effective than Strain counterstrain technique on unilateral trapezitis in sitting job professionals.

H2: Strain counterstrain technique is more effective than Myofascial release technique on unilateral trapezitis in sitting job professionals.

## 4. Review of Literature

1. Chorsiya V, Sheikh S (2013)<sup>[3]</sup> conducted a study Strain Counter-Strain Technique for Immediate Relief of Trapezitis in Sitting Job Professionals. Twenty subjects with tender points and trigger points were identified with job profile sitting including the sitting work in the preferred position for more than 6 hours of duration. When there was the hyper sensible tender spot in a palpable taut band, local twitch response elicited by snapping palpation of the taut band and reproduction of the referred typical of each TrP. pain. Local pain and range of motion for lateral flexion of the cervical region. The outcome measure was visual analog scale assessing pain. Local pain and range of motion for lateral flexion of the cervical region. When there was the hyper sensible tender spot in a palpable taut band, local twitch response elicited by snapping palpation of the taut band and reproduction of the referred typical of each TrP. pain. Local pain and range of motion for lateral flexion of the cervical region. It was concluded that patients with tender and trigger points in trapezius muscle can be effectively treated using the SCS Technique<sup>[3]</sup>.
2. Ravish V. N, Shridhar, Sneha Helen (2014) conducted a study to compare the effectiveness of Myofascial release versus Positional release technique in patients with Laser in patients with unilateral trapezitis. Sixty students with trapezitis were selected between 20-50 years of age. Outcome measures were VAS, Cervical ROM and neck disability. The study concluded that the effectiveness of the Myofascial release technique with the laser has showed better improvement than the Positional release technique<sup>[15]</sup>.
3. Ekta S. Chaudhary , Nehal S, Neeta V, Ratan K, Dhara C, Gopal N (2013) conducted the Comparatively study of the Myofascial release technique and Cold Pack in Upper trapezitis Spasm.

- This study concluded MFR showed greater significant improvement on the visual analog scale, pain pressure threshold, and ROM [7].
4. A.kumaresan, G.Deepthi, Vaiyapuri Anandh, S. Prathap. (2014) Effectiveness of Positional Release Therapy of Trapezitis.

Patients with unilateral trapezitis between age: 20-55 year, Thirty subjects with unilateral upper trapezius spasm were randomly allocated into two groups namely Group A and Group B and treated with therapeutic Ultrasound and Isometrics which were common to both the groups. Positional Release Therapy as an added intervention was given to the Group. This study concluded that positional release therapy is useful in reducing neck pain and improve the functional ability as shown in terms of visual analog scale and Neck disability index [2].

5. Christopher Kevin Wong (2011) Strain counterstrain: Current concepts and clinical evidence. Strain counterstrain is an osteopathic manipulative technique about which research is only recently emerging. This master class reviews the evidence investigating proposed physiologic mechanisms and clinical effects of strain counterstrain. The study concluded that the general suggestions for SCS use in common clinical scenarios may guide practitioners to successful outcomes.[13]

## 5. Methodology

- Study type – Comparative Study.
- Study design- Pre and post-experimental study.
- Sample size- 60.
- Sampling design- Simple random sampling.
- Study population- Sitting job professionals.
- Study setting – Outpatient Physiotherapy departments in and around Pune city.
- Study duration- 6 months

## 6. Inclusion and Exclusion Criteria

### Inclusion criteria

1. Both Male and Female Subjects.
2. Subjects with age group 20-50 years.
3. Job experience of a minimum of 6 months.
4. The job profile included the sitting work in the preferred position for more than 6 hours of duration.
5. Restriction in cervical lateral flexion (i.e. less than 45 degrees).
6. Taut band palpable in the upper trapezius muscle.
7. Pain elevated by elongating (stretching) the trapezius muscle.

### Exclusion criteria

1. Traumatic neck injury.
2. Fracture of cervical vertebrae.
3. Cervical radiculopathy.
4. Pathological conditions- Cervical spondylosis, Spinal tuberculosis, Vertebral osteomyelitis.
5. Spinal tumors.
6. Skin disease and infection.
7. Recent surgery in and around the shoulder and cervical region within the past 1 year.

### Diagnostic criteria [18]

1. Taut band within the upper trapezius muscle.
2. Exquisite tenderness at a point on the taut band.

3. Reproduction of the patient's pain.
4. Local twitch response.
5. Referred pain sensation on compression of the taut band.
6. Restricted cervical ROM.
7. Autonomic signs (skin warmth or erythema, tearing, piloerection [goose-bumps])

## 7. Material

- Chair
- Pillows
- Goniometer
- Consent form

## 8. Outcome measures

### 1. NPRS [9]

NPRS is to measure pain intensity in adults. In which individuals rate their pain on an eleven-point numeric scale. The scale is composed of 0 (no pain at all) to 10 (Worst imaginable pain)

### 2. Cervical lateral flexion [10]

The cervical lateral function will be recorded with a universal goniometer. UG is cheap to use, a popular instrument. Its validity and reliability is high in clinical settings.

To measure cervical lateral flexion the examiner centers the body of the goniometry over the subject's 7th cervical vertebra. The freely movable proximal goniometry arm hangs so that it is perpendicular to the floor. At the end of the lateral flexion ROM, the examiner maintains the alignment of the proximal Goniometry arm and measurement is taken.

## 9. Procedure

The subjects were randomly divided into 2 groups using the chit method.

**Group A:** 30 subjects were treatment groups receiving the Myofascial release technique.

Patient Position: sitting comfortably with supported back, elbow flexed with the forearm placed on a pillow. A low load, the long-duration stretch is applied along the lines of maximal fascial restrictions. The fascia is palpated and the pressure is applied directly to the skin, into the direction of restriction just until resistance (tissue barrier) is felt. The pressure is applied for 90 to 120 seconds. This procedure is carried out without sliding over the skin or forcing the tissue until the fascia complex starts to yield and a sensation of softening is achieved. The therapy was given for 5 minutes.

**Group B:** 30 subjects were treatment group receiving Strain counterstrain technique.

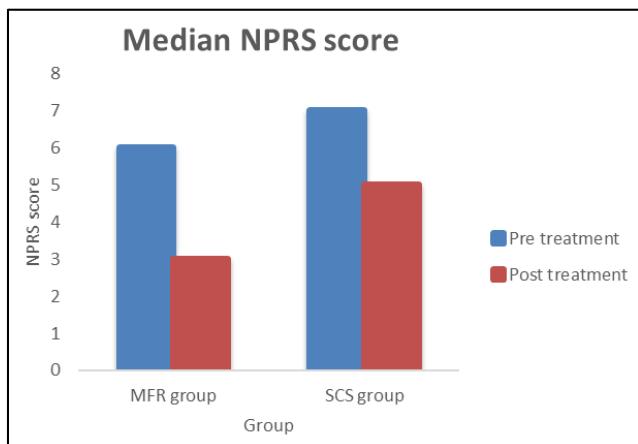
**Patients Position:** The subject lies supine with the therapist standing on the affected side; tender points are located along the upper fibers of the trapezius. The pressure is applied by pinching the muscle between the thumb and fingers. The subject's head is laterally flexed toward the side of the tender point, the therapist grasps the subject's forearm and abducts shoulder to approximately 90° a slight flexion or extension is added to obtain fine-tune. The ideal position of comfort achieved is held for 90 seconds and followed by a passive return of the body part to an anatomically neutral position continued for 5 minutes.

## 10. Data Analysis and Result

Statistical analysis was done by using SPSS software version 20.0.

**Table 1:** Effect of MFR and SCS on the Numeric pain rating scale.

NPRS	MFR			SCS			p-value (Intergroup)
	Min	Max	Median	Min	Max	Median	
Pre	3	8	6	4	9	7	0.027*
Post	0	6	3	1	6	5	< 0.001*
p-value (Intra group)	< 0.001*			< 0.001*			

**Fig 1:** Comparison of pre and post treatment of NPRS of both the groups**Interpretation:** Table no 1 shows the results of:-

Intragroup Conclusion (Wilcoxon Sign Rank test used):-

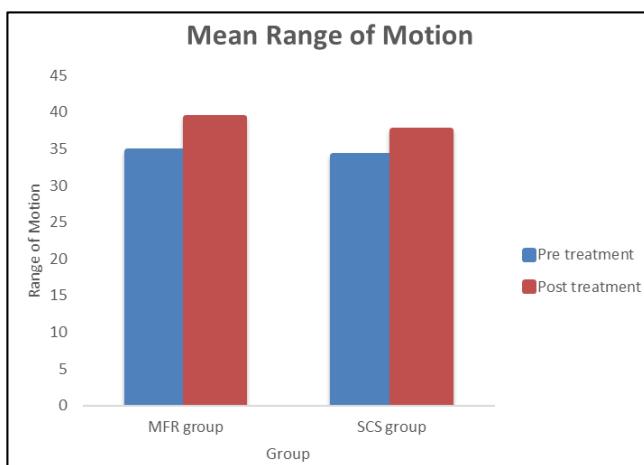
\*p-value &lt; 0.05, therefore, there is a significant difference between mean NPRS at Pre-treatment and Post-treatment in MFR group and SCS group

Intergroup analysis (Mann-Whitney U test used):-

\*Significant (p-value &lt; 0.05) therefore there is a significant difference between mean NPRS in the MFR group and SCS group at Pre- treatment and Post-treatment

**Table 2:** Effect of MFR and SCS on cervical range of motion.

Range of Motion	MFR (N=30)		SCS (N=30)		p-value (Intergroup)
	Mean	SD	Mean	SD	
Pre treatment	34.63	4.73	34.13	5.30	0.701
Post treatment	39.30	4.84	37.50	5.48	0.183
p-value (Intra group)	< 0.001*		< 0.001*		

**Fig 2:** Comparison of pre and post treatment of Cervical lateral flexion of both the groups**Interpretation:** The above table 2 shows the results of:-

Intergroup analysis (Unpaired t-test used):-

p-value &gt; 0.05, therefore, there is no significant difference between mean Range of Motion in MFR group and SCS group at Pre-treatment and Post-treatment

Intragroup Conclusion (Paired t-test used):-

\*p-value &lt; 0.05, therefore, there is a significant difference between mean Range of Motion at Pre-treatment and Post-treatment in MFR group and SCS group.

## Results

The study showed that there was a significant difference between pre and post-treatment within each group A and B in pain intensity level and improvement in cervical range of motion. There was no statistically significant difference between groups A and B in pain intensity level and cervical range of motion.

## 11. Discussion

The study intended to compare the immediate effect of Myofascial release and Strain counterstrain technique in sitting job professionals on unilateral trapezitis.

The results showed that between-group comparison revealed that for NPRS for Pain intensity and cervical range of motion there was a significant difference within group but more in favor of MFR technique. The comparison of post-treatment values of NPRS, Cervical lateral flexion showed no statistically significant difference between the groups, i.e Group A MFR and Group B SCS.

Neck pain is a common problem in the general population with prevalence between 10% to 15% 2. The prevalence of neck pain between 67% to 87% 3. Neck pain is thought to be multifactorial. The excessive physical strain may cause micro trauma in connective tissues. The cervical spine is the most intricate region of the spine and so are the muscles of this region. The principle muscle to carry the load is the trapezius [11].

Myofascial trigger points (MTrPs) as the presence of exquisite tenderness at a nodule in a palpable taut band of muscle.

Trigger points can be most commonly seen in the setting of occupational due to muscle imbalances, postural deficiencies, or secondary to another underlying pathological process. Simon et al. 1998, mechanism of increased or altered muscle demand include prolonged muscle contraction, commonly seen in workplaces, commonly amongst the desk workers, which may present complain of headache that is reproducible with pressure over the trapezius trigger points [5].

Ekta S. Chaudhary conducted the study comparative study of the Myofascial release technique and cold pack in the upper trapezitis spasm.

By MFR there is a change in the viscosity of the ground substance to a more fluid state which eliminates the fascia's excessive pressure on the pain-sensitive structure and restores proper alignment. This technique acts as a catalyst in the reduction of the trapezius spasm. This study concluded MFR showed greater significant improvement in VAS, PPT, and

ROM. In this study, MFR reduces pain on outcome measure: VAS Numeric Pain Distress Scale [7].

Varsha C. Shabir Sheikh conducted a study of the immediate effect of Strain counterstrain technique in the immediate relief of trapezitis in sitting job professionals, results suggested that strain counter strain technique is effective in reducing tenderness and trigger points in the upper trapezius in sitting job professionals [3].

The PRT aims to remove restricted barriers of movement in the body. This is accomplished by decreasing protective muscle spindle, muscle spasm, fascial tension, joint hypomobility, pain, swelling and increasing circulation and strength. As a result, this allows the patient to move easily, with less pain and discomfort. One theory holds that while the body in position of comfort, there is a reduction and arrest of inappropriate activities. As treating using SCS, there is a decrease in muscle tension, fascial tension, and joint hypomobility. These changes, in turn, results in a significant decrease in pain [8].

## 12. Conclusion

It was found that the MFR technique is more effective in treating pain and increasing the range of motion. SCS technique is equally effective in treating pain and increasing the range of motion. Both MFR and SCS were shown to be effective in reducing pain and increasing range of motion, no statistical difference was proven between them.

## 13. Limitations

The duration of intervention can be further extended. The study was conducted on a small population.

## 14. Further Scope

It can be further studies on a larger population.

There is a lack of follow up data to check whether the benefit of MFR and SCS techniques persists or not.

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