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Immediate effect of myofascial release technique and active release technique on mechanical neck pain in sewing machine operator: A comparative study

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Abstract

Background: Trapezius muscle pain and spasm is most common musculoskeletal disorder occurring in individuals who works with an awkward position of neck for a prolonged period of time, with repetitive movements. The problem of neck disorders has been found to increase with years of employment as a sewing machine operator. Active Release Therapy (ART) and Myofascial Release (MFR) are soft tissue manipulation techniques practiced by physiotherapists for reducing muscle spasm and pain.

Objective: To compare the immediate effects of ART and MFR on neck pain and range of motion in sewing machine operators with mechanical neck pain.

Method: The study was done on 60 subjects, subjects were selected according to the inclusion criteria. They were divided into two groups Group A (ART) and Group B(MFR) 30 each. Goniometer for cervical ROM and Numerical Pain Rating Scale were taken as outcome measure. Pre and Post ROM and NPRS were taken. The data was recorded and data analysis was done.

Result: Paired t-test was used to compare the pre-post outcome differences within each group, while unpaired t-test was used to compare the post-post differences between the two groups for the same outcome measures. Immediate effects was found in both the groups, but the group which received ART showed significant improvements in neck ROM ($p < 0.001$), and in VAS ($p < 0.0001$) as compared to group which received MFR.

Conclusion: The present study conducted has shown that ART is more effective in reducing pain and improving cervical ROM in sewing machine operators with neck pain as compared to MFR.

Keywords: Cervical range of motion, numerical pain rating scale, trapezius spasm, neck pain

Introduction

Neck pain is the common MSK complaints and is attributed as the second largest type of pain after low back pain. Prevalence of neck pain is 78.57% in sewing machine operators. Muscle spasm keeps the muscle continuously in contraction and this overload creates knot in the muscle. These are known as trigger points leading to pain. Neck pain and restricted movements leads to stiffness which further aggravate pain, muscle spasm and increase in soft tissue tightness. It is essential to provide relief and to improve the function. The problem of neck disorders has been found to increase with years of employment as a sewing machine operator. Sewing machine operator are exposed to greater continued static burden on neck and shoulder muscles on both left and right sides. Trigger points in skeletal muscles of neck and shoulder can lead to referred pain in neck. The prevalence of neck pain is higher in sewing machine operators. Physiotherapy is the choice of treatment for trapezius spasm which includes myofascial release technique and active release technique. In ART digital pressure is applied over the tender point (trigger point) in a shortened position of the muscle and then patient is asked to actively take it in an opposite lengthened position. This will break the adhesions. MFR therapy involves specifically guided low load, long duration mechanical forces to manipulate the myofascial complex, intended to restore optimal length, decrease pain, and improve function. MFR utilizes the manual traction and prolonged stretching of the fascia and muscle to break down the adhesions, thus helps to decrease the pain and increase flexibility and thereby increase ROM.

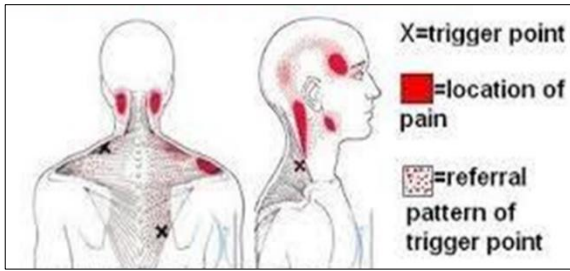


Fig 1: Location of trigger point and pain in upper trapezius muscle

Material

Consent forms, Pen, Paper, Goniometer, NPRS, Chair.

Method

The study began after receiving ethical clearance from P.E.S Modern College of Physiotherapy, Pune. 60 participants were selected, according to the inclusion (Participants between age group of 20 to 40, daily sitting hours for 6 hours or more, NPRS score in between 3-7, reduced Cervical ROM) and exclusion (Cervical radiculopathy, history of trauma or fracture or surgery in the neck or upper back or shoulder, congenital deformities, participant with neck pain but not altered ROM) criteria. The whole study were explained to the participants. They were divided into two groups, Group A and Group B, 30 each. Group A received ART and group B received MRF. Neck ROM, NPRS tools were used as outcome measures. Cervical ROM (flexion, extension, lateral flexion both right and left) and NPRS was taken prior the treatment.

For application of ART-Patient will be made to sit on a stool with hands supported on the thighs. Therapist will stand behind the patient stabilizing the shoulder with one hand. Neck will be taken in side flexion and contact will be made using thumb with the trapezius muscle over the tender area and deep tension stretch will be applied. Patient then will be

asked to do opposite side lateral flexion of cervical. This will be repeated for 3-5 times.

For application of MFR-Patient will be sitting on stool, arm supported on thighs. Therapist will stand behind the patient close on the side to be treated. Forearm and/or ulnar border of the palm will be used to apply the pressure and glide medially towards the base of the neck and/ or towards the upper scapular region. As the glide will be given, patient is asked to do side bending and to turn the head in opposite direction while sitting in erect position. Glides were given for 3-5 times.

Immediately 2 mins after the treatment again cervical ranges (flexion, extension, lateral flexion both right and left) and NPRS was taken. Data was collected and paired t-test was done for compare pre-post results and unpaired t-test was done to compare post-post results.

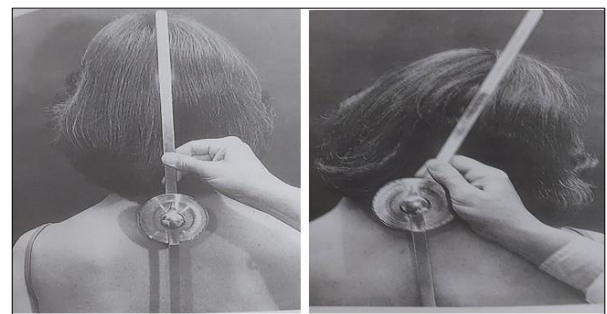


Fig 2: Goniometer position for cervical range of motion

Data analysis

The statistical analysis for this study was done using the software (instat graph pad).

Statistical test used was paired t-test to compare pre-post results of both the technique, unpaired t-test to compare the post-post results of both the technique.

Table 1: Comparison of pre-post mean value of ART and MFR on cervical range of motion and NPRS

Outcome measure	ART Mean			MFR Mean			
	Pre	Post	p-value	Pre	Post	p-value	
ROM	Cervical Extension	48.5	60.93	<0.0001	48.5	54.23	<0.0001
	Cervical Flexion	59.46	71.16	<0.0001	59.46	64.7	<0.0001
	Cervical Lateral Flexion Rt	29.8	41.5	<0.0001	29.96	34.9	<0.0001
	Cervical Lateral Flexion Lt	29.46	42.16	<0.0001	29.46	35.96	<0.0001
NPRS	5.76	0.66	<0.0001	5.66	2.5	<0.0001	

Table 2: Comparison of post-post mean values of ART and MFR on cervical range of motion and NPRS

Outcome measure	ART-MFR Mean			
	Post	Post	p-value	
ROM	Cervical Extension	60.93	54.23	<0.0001
	Cervical Flexion	71.16	64.7	<0.0001
	Cervical Lateral Flexion Rt	41.5	34.9	<0.0001
	Cervical Lateral Flexion Lt	42.16	35.96	<0.0001
NPRS	0.66	2.5	<0.0001	

All test have $p < 0.0001$, so results are extremely significant.

Result

The study comprised of 22 male, 8 female in Group A and 22 male, 8 female in Group B.

Paired t-test was done to compare pre-post results of cervical ROM and NPRS of both the groups which showed p-value <0.0001 which is consider extremely significant.

Unpaired t-test was done to compare post-post results of

cervical ROM and NPRS of both the groups which showed p-value <0.0001 which is consider extremely significant.

The mean values of Post ART for cervical ROM and NPRS shows significant improvement than Post MFR which states ART is more effective than MFR in reducing neck pain and increasing cervical ranges in sewing machine operators.

Conclusion

The present study conducted has shown that ART is more effective in reducing pain and improving cervical ROM in sewing machine operators with neck pain as compared to MFR.

Limitations of the study

- The study consists of a small quantity of patients.
- No long term follow up was done.

Scope for further study

- Further study can be done with larger sample size.
- Study can be done with long term follow up.

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