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Effect of Myofascial Release Therapy on Pain, Tissue Hardness, Range of Motion and Disability among patients with Text Neck Syndrome

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ABSTRACT

Objectives: To find out the effects of Myofascial Release Therapy on Pain, tissue hardness, range of motion and Disability among patients with Text Neck Syndrome

Methodology: Twenty-five Doctor of Physical Therapy students having Text neck syndrome meeting the inclusion criteria were included in the study. Pre and post Visual analog scale (VAS) was used to check the pain scale, a Neck Disability index to check the disability, a goniometer to check the range of motion (ROM) of the suboccipital muscle, sternocleidomastoid muscle, and trapezius muscle, and Algometer was used to check the Tissue Hardness of suboccipital muscle, sternocleidomastoid muscle, and trapezius muscle. Pre-assessment was done on the first day and post-assessment on the final day of the treatment. The total period of treatment was four weeks. Informed consent was taken and the confidentiality of the participants was maintained.

Results: The results showed the readings of the Visual Analog Scale (VAS) pre-mean and, S.D were 2.60±0.50 and the post-mean and S.D was 1.16±0.37. The Neck Disability Index was 1.40±0.76. The pre and post-range of motion of the cervical spine also showed significant results. Flexion ROM post mean and S.D was 44.6±2.9. Extension ROM post mean was 79.8±1.0. Tissue hardness of cervical muscles was observed. The right trapezius muscle post mean was 16.3±5.5 and the left trapezius muscle post reading was 16.4±5.4. The right Sternocleidomastoid muscle post reading was 5.4±2.3. The Left Sternocleidomastoid muscle post reading was 5.0±1.6. The right suboccipital muscle post reading was 6.2±1.6. left suboccipital muscle post reading was 5.9±1.5.

Conclusion: It was concluded that Myofascial release has a better impact in treating pain, cervical range of motion, disability, and tissue hardness among patients with text neck syndrome.

Keywords: Text Neck Syndrome, Myofascial Release, Pain, Tissue Hardness, Range of Motion

INTRODUCTION

Turtle Neck Syndrome, generally known as Text Neck Syndrome is a postural condition that occurs due to repetitive stress due to constant forward leaning of the head to see the device. A human head weighs almost 10lb in a neutral position often explained as when ears fall over the shoulders. For

every inch of forward head tilt, the pressure on the spine gets doubled which results in muscle strain causing neck pain. (1). It is a global epidemic as according to a survey conducted in the United States of America forty percent (40%) of the young population faced turtle neck syndrome. (2). According to another study in India the prevalence of turtle neck syndrome is 32% affecting 80% of females and 20% of males. (3)

The word turtle neck was defined by Dr. Dean L Fisherman to explain the repetitive stress injury due to prolonged forward bending posture of the head using a smartphone and other handheld devices like tablets, laptops, etc. It distresses the spine directly while bending the head forward at variable degrees. When the neck bends at 15 degrees, the force on the neck increases to 27 pounds, at 30 degrees 40 pounds, at 45 degrees 49 pounds, and 60 degrees at 60 pounds. (4). Symptoms include neck pain, neck stiffness, soreness, straightening of the spinal curve, weakness, and headache. It can lead to permanent damage to the spine if left untreated like early arthritis, spinal malalignment, spinal degeneration, compression of the disc, herniated disc, or damage to the nerve. (5).

The diagnosis of turtle neck syndrome is made through physical examination including neck range of motion using goniometry and measuring the cranial vertical angles. Treatment could be conservative or surgical depending upon the severity. Usually a conservative treatment is recommended as text neck syndrome is not that much severe case for surgical intervention. It includes physical therapy which helps in pain management, improvement of range, lifestyle modifications, and posture correction. Chronic cases may include corticosteroid injections, manipulations, and acupuncture. (4,5).

Therapies including exercise, lifestyle modifications, and manual therapy are most cost-effective treatments for neck pain. (6). Myofascial release therapy (MRT) is a technique of physical therapy which is intended to decrease pain, restore optimum length, and recover function with a low-load and long-duration stretch to the myofascial complex. It is proposed that an undue tension in one part of the body can cause fascial limitations in other parts of the body due to fascial continuity. (7) According to the literature MRT has revealed improved outcomes than any other manual therapy for the improvement of the quality of life in subjects with work-related neck pain and cervical range of motion. (8). An additional study suggests that MRT improves pain perception and is effective in releasing the area of impaired sliding fascial mobility in people with nonspecific neck pain. (9).

One of the most important components of neck pain rehabilitation is exercise. According to the patient's situation a set of low-load endurance training, scapular muscle re-training, strengthening and stretching exercises, joint mobilization, massage, and ergonomically correct advices are given. (10)

Hae-Jung Lee conducted a study in the year 2013 to investigate the posture of the neck, its range of motion, pain, and disability among mobile phone users. It was concluded that 38% of people experience recurrent neck pain. It was also established that the timing of the usage of smartphone was negatively correlated but positively correlated with postural deformity. (11).

A study was conducted in the year 2013 which included 25 nurses, 25 office staff, 25 media desk executives, 87 family physicians, and one electronic TV media house to check their phone habits. The results showed 26 % of persons had turtle neck syndrome with anxiety and disturbed sleep. (5).

In 2020, the prevalence of text neck syndrome was checked in the young adult population. 100 physical therapy students were taken and it was found that the prevalence of text neck syndrome is 32%. Among them, 80% of females and 20% of males were affected. (3)

In 2019, a study was conducted to check the frequency of turtle neck syndrome in medical students due to excessive use of electronic devices. It was found that 43% of students had turtle neck syndrome. Females were more prone to have this syndrome as compared to males. (12).

A systemic review on Myofascial Release as a treatment for orthopedic conditions was conducted. Inclusion criteria were based on that the studies were in English language and peer-reviewed studies on the myofascial release for an orthopedic condition in adult patients. The results concluded positive outcomes of myofascial release. (13).

A study was conducted in the year 2021 to identify the Efficacy of Pilates along with Conventional Exercise Program and only Conventional Exercise Program in patients with Text Neck Syndrome. It was concluded that both treatment groups showed better outcomes in reducing pain, disability, and increased range of motion. However, the Pilates group showed more significant results in comparison to the conventional group. (10,14)

The study might be beneficial:

1. To choose the best treatment method for people suffering from turtle neck syndrome.
2. To find out the quick and fastest relief of pain so the study will be clinically implicated for both the therapist and patients in the reduction of pain scale and activity improvement.

METHODOLOGY

Study Design & Subjects

The study design was experimental. Twenty-five Doctor of Physical Therapy students having text neck syndrome were included in the study. The sampling technique was simple random sampling with a mean age of 27.8 and S.D ±5.9. Initially, all the participants were screened for text neck through a screening questionnaire.

Inclusion & Exclusion Criteria

Inclusion criteria included Doctor of Physical Therapy (DPT) students having text neck syndrome and those who used mobile for at least 6 hours and were willing to participate. Those who had any other cervical pathologies, orthopedic problems, cervical radiculopathy, neurological deficits, recent cervical injuries, or cognitive issues were excluded from the study.

Outcome Measures

Visual Analog Scale (VAS), Neck Disability Index (NDI), Goniometer and Algometer were the outcome measures. To check the pain scale the pre and post Visual analog scale (VAS) was taken along with a goniometer to check the range of motion of the sub occipital muscle, sternocleidomastoid muscle, and trapezius muscle. The neck disability index for disability and algometer were used to check tissue hardness of the suboccipital muscle, sternocleidomastoid muscle, and trapezius muscle. Pre-assessment on day one and post on the last day of the session was conducted. The total duration of treatment was four weeks.

Data Collection Procedure

All patients received MFR therapy on three muscles of the neck for four weeks. The following exercise protocol was followed:

1. Sub occipital Muscles

The patient was asked to lie in a supine position with a towel roll under the neck to level the trunk with the head. The therapist was sitting on a stool at the head of the table with palms under the patient's head just caudal to the nuchal line. Put an adequate stretch towards the top of the patient's head. Hold, wait for release, and stretch again. Then, lifts the fingers upwards while resting the hands on the table. This is followed by a gentle cranial pull causing an axial traction. Repeat the sequence until the end feel was reached.

2. Sternocleidomastoid muscle

The patient was asked to lie comfortably in a supine position. The therapist performed a focused release of the right sternocleidomastoid muscle using several fingers of one hand and the thumb of another hand making sure to prevent any lateral flexion. Hold, wait for release, and repeat until an end feel was reached. Repeat the procedure on the left side.

3. Upper trapezius Muscle

The patient lay in a supine position with the therapist's forearms fully supported on the treatment table and palms on the patient's shoulder. A stretch was applied bilaterally towards the shoulder joints in line with the fibers of the upper trapezius. Hold, wait for release, and stretch again until an end feel was reached.

Data Analysis

The data was analyzed on SPSS version 23. Pre and post-mean and standard deviations were calculated at the 95% confidence level.

Ethical Considerations

Consent was taken from the patients and permission was granted from the Institutional Bioethical Committee. Data were coded and the confidentiality of the participants was maintained. Patients meeting the inclusion criteria, clearing the screening questions and those who were willing to participate were included in the study.

RESULTS

The results showed the effect of MFR therapy on pain, ROM, disability, and tissue hardness among students having text neck syndrome.

Out of twenty-five participants, 9 were males and 16 were females. Table 1 shows readings of Visual Analog Scale (VAS) pre mean and S.D 2.60±0.50 and post mean and S.D was 1.16±0.37. Table 2 describes the Neck Disability Index pre-reading was 2.28±0.84 and post-reading was 1.40±0.76. Table 3 shows the pre and post cervical spine range of motion that also showed significant results. Flexion ROM pre mean and S.D was 36.4±5.2 and post reading was 44.6±2.9. Extension ROM pre mean and S.D was 74.4±1.6 and post reading was 79.8±1.0. Table 4 shows reading of Tissue hardness of cervical muscles was observed. Right trapezius muscle pre mean 19.0±5.5 and post mean was 16.3±5.5. left trapezius muscle pre reading 19.0±5.4 and post reading was 16.4±5.4. Right sternocleidomastoid muscle pre reading was 9.8±3.1 and post reading was 5.4±2.3. Left sternocleidomastoid muscle pre reading 9.6±3.0 and post reading was 5.0±1.6. Right sub occipital muscle pre mean was 12.9±3.0 and post reading was 6.2±1.6. left sub occipital muscle pre mean was 11.8±2.6 and post reading was 5.9±1.5.

Table 1: Visual Analog Scale (VAS) Pre & Post

Readings	**Mean**	**S.D**	**Significance**
Pre	2.6	±0.50	0.00
Post	1.16	±0.37	

Table 2: Neck Disability Index (NDI) Pre & Post

Readings	**Mean**	**S.D**	**Significance**
Pre	2.28	±0.843	0.00
Post	1.40	±0.764	

Table 3: Range Of Motion (ROM) Pre & Post

Techniques	**Readings**	**Mean**	**S.D**	**Significance**
Flexion	Pre	36.48	±5.21	0.00
	Post	44.60	±2.98	
Extension	Pre	74.40	±1.65	0.00
	Post	79.80	±1.00	

Table 4: Tissue Hardness Pre & Post

Techniques	**Readings**	**Mean**	**S.D**	**Significance**
Right Trapezius	Pre	19.0	±5.58	0.00
	Post	16.3	±5.56	
Left Trapezius	Pre	19.0	±5.45	0.00
	Post	16.4	±5.48	

Right Sternocleidomastoid muscle	Pre	9.80	±3.16	0.00
	Post	5.48	±2.36	
Left Sternocleidomastoid muscle	Pre	9.60	±3.04	0.00
	Post	5.04	±1.62	
Right Sub occipital muscle	Pre	12.92	±3.04	0.00
	Post	6.20	±1.62	
Left Sub occipital muscle	Pre	11.88	±2.60	0.00
	Post	5.96	±1.51	

DISCUSSION

A sample of 25 patients was taken in the current study. The readings of the Visual analog scale (VAS) pre-mean and S.D were 2.60±0.50 and the post-mean and S.D was 1.16±0.37. After the four weeks of treatment a significant improvement in the pain was observed. Most of the patients were either pain-free or mild pain at VAS. The pre and post-mean S.D of the Neck Disability Index were also observed. It was found that pre-reading was 2.28±0.84 and post-reading was 1.40±0.76. All the components including pain intensity, personal care, lifting, reading, headache, concentration, work, driving, sleeping, and concentration showed improvement. The pre and post- cervical spine range of motion also showed significant results. Flexion ROM pre-mean and S.D was 36.4±5.2 and post-reading was 44.6±2.9 i.e a significant increase in the range. Extension ROM pre-mean and S.D was 74.4±1.6 and post-reading was 79.8±1.0. Tissue hardness of cervical muscles was observed. The right upper trapezius muscle pre-mean was 19.0±5.5 and the post-mean was 16.3±5.5. left upper trapezius muscle pre-reading was 19.0±5.4 and post-reading was 16.4±5.4. The right sternocleidomastoid muscle pre-reading was 9.8±3.1 and post-reading was 5.4±2.3. Left sternocleidomastoid muscle pre-reading was 9.6±3.0 and post-reading was 5.0±1.6. The right sub occipital muscle pre-mean was 12.9±3.0 and the post-reading was 6.2±1.6. left sub occipital muscle pre-mean was 11.8±2.6 and post-reading was 5.9±1.5. It was observed that all muscles had a decrease in tissue hardness and showed significant results. Whereas the previous study was conducted by Seong Joong Kim and Jung Hoo Lee to check the effects of myofascial release on latent trigger points of sub occipital, sternocleidomastoid, and upper trapezius muscles. A significant decrease in tissue hardness and an increase in pain pressure threshold was observed. (15)

Another study conducted by Manuel Rodríguez et al in the year 2018 suggested that significant mean differences were observed in VAS (−0.99, 95% confidence interval [CI] = −1.82 to −0.16), in both left (0.28, 95% CI = 0.06 to 0.50) and right (0.40, 95% CI = 0.16 to 0.63) sub occipital pain pressure thresholds and in the right trapezius PPT (0.38, 95% CI = 0.07 to 0.69) were observed after the treatment. Significant mean differences were found for VAS (−1.85, 95% CI = −2.76 to −0.94) and both left (0.46, 95% CI = 0.12 to 0.80) and right (0.38, 95% CI = 0.06 to 0.69) sub occipital pain pressure thresholds at the 1-month follow-up. (16)

CONCLUSION

It was concluded that Myofascial release has a better impact in treating pain, cervical range of motion, disability, and tissue hardness among patients with text neck syndrome.

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