EFFECTIVENESS OF MUSCLE ENERGY TECHNIQUE AND SUBOCCIPITAL AND STERNOCLEIDOMASTOID MUSCLE RELEASE IN PATIENTS WITH FORWARD NECK POSTURE AND NECK PAIN

Abstract

Background: The most prevalent musculoskeletal condition in the general population is neck pain. Neck discomfort is a disorder that exerts a significant financial strain on the healthcare system, with up to 37% of people experiencing persistent symptoms. The wrong posture is still the most frequent cause. Patients have reported having forward-leaning neck posture, which is a postural deviation brought on by biomechanical changes including not only the cervical and thoracic regions but also the scapular position.

Objective: To determine whether the myofascial release and the muscle energy technique are effective on patients with forward neck posture and neck pain.

Methodology:A case series of5 patients with neck pain having craniovertebral angle (CVA) <48° and Neck disability index (NDI) >5 were included. The patients underwent 2-weeks of intervention of muscle release and muscle energy technique on sternocleidomastoid and suboccipital muscle. Outcome measures CVA and NDI.

Result: The comparison between pre-post treatment of CVA and NDI was done using t-test. The

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results showed an extremely significant difference in CVA and NDI between pre and post treatment value after implementing muscle release and muscle energy technique ($p<0.001$) and ($p<0.19$) respectively.

Conclusion: The study concludes that by the application of muscle energy technique andmuscle release on the individuals with forward neck posture and neck pain results in improvement in their CVA and reduction in neck pain. There was noticeable improvement in cervical range of motion and muscle power. Hence, combination of the two interventions can be effective in managing the forward neck posture and neck pain.

Keywords: Craniovertebral angle, Neck disability index, muscle release and muscle energy technique.

I. INTRODUCTION

Neck discomfort is the most prevalent musculoskeletal condition that the general public experiences[1]. At some point in their life, almost two thirds of people experience neck pain, and middle-aged people are most likely to experience it[2]. Various factors can contribute to neck pain, but poor posture continues to be the most common cause[3].

Forward-facing neck positions have been used to observe patients with neck pain.[4] A forward head posture promotes extension of the atlanto-occipital joint and the upper cervical vertebrae as well as flexion of the lower cervical and upper thoracic vertebrae.[5]When a terrible posture is kept for an extended amount of time, the head is positioned forward.[6] The levator scapulae, suboccipital, sternocleidomastoid, and upper trapezius muscles all abnormally shorten together with the longus capitus.[7]. In order to keep the eye level with the horizon, the sub occipital muscles are hypertonic when the head is positioned forward. As the sternocleidomastoid muscle experiences hyperactive tension, tone, and tiredness, this affects patients' disabilities and neck pain[8]. The load on the neck structures will rise as a result[9].

Myofascial release is a manual treatment technique that stretches the fascia and releases the connection between the fascia, muscles, and bones[10]. Applying relaxation therapy to soft tissue causes a decrease in discomfort and tone. An advanced stretching technique is muscle energy technique.[11] It is a type of therapy where a patient voluntarily contracts a muscle or muscles in a precise, controlled direction in opposition to a force applied by the practitioner.[12] Because the client puts up the initial effort while the practitioner facilitates the process, it is unusual in its applicability. It is claimed to be beneficial for a variety of purposes, including lengthening shortened or contracted muscles, developing muscles, serving as a lymphatic or venous pump to help drain fluid or blood, and increasing the range of motion of a restricted joint.[13]

This study is undertaken to find out if the application of myofascial release and muscle energy technique of sternocleidomastoid and suboccipital muscles is effective on the patients with forward neck posture with neck pain.

Objective

To find out the effectiveness of Myofascial release (MFR) and Muscle energy technique (MET) on forward neck posture patients with neck pain.

II. METHODOLOGY

A case series was conducted in A.J hospital, Mangalore. All the subjects fulfilling inclusion criteria wereincluded for this study using convenient sampling method.

1. Inclusion Criteria:

- Age - 20-25 years
- Gender: Both male and female
- Experiencing neck pain for more than 3 months,

- Neck Disability Index (NDI) score ≥5,
- Craniovertebral angle < 48º.

2. **Exclusion Criteria:** recent traumatic experience, fall or cervical injuries, thoracic or cervical spine surgery instance, cervical herniation, radiculopathy, or stenosis Thoracic outlet syndrome, cancer, Vertebral-basilar artery syndrome, vertigo, cervicogenic headaches, and dizziness.

Data Collection: Patients were recruited from A.J hospital and after initial assessment the participants who met the inclusion criteria, they briefed about the study and informed consent was taken. The procedure was explained to the participants and was subjected to clinical examination. Neck disability index scale was administered and responses were noted. In total, about 30 subjects were screened and out of which 5 the inclusion criteria. Participants were assigned to a 2-week intervention session, underwent 20–25 minutes of treatment each day, and were notified for follow-up the third week. The interventions are listed below in brief.

III. PROCEDURE

Subjects were included depending on their Neck disability index score and the degree of cranio-vertebral angle. These subjects were asked to score their neck pain by themselves using NDI. The perception of disability in patients with neck discomfort is captured by NDI measurement. The patient themselves filled it out. The scale filled up in about 5 minutes. The CVA is measured by using the universal goniometer. Along with the CVA, cervical flexion, extension, lateral flexion and rotation were calculated.5 subjects were included for the study and the treatments i.e. myofascial release followed by MET of sub occipital and sternocleidomastoid were given for 2 weeks (4 sessions per week).The subjects were asked to re-visit for the follow-up on the 3rd week after post-treatment. Subjects were assessed again for the Neck Disability Index score, Cranio-vertebral angle and range of motion of cervical flexion, extension, rotation and lateral flexion and noted down for the comparison.

IV. RESULT

The comparison between pre-post treatment of CVA and NDI was done using t-test. There was a highly significant difference in CVA and NDI between pre and post treatment value after implementing muscle release and muscle energy technique ($p<0.001$) and ($p<0.19$) respectively.

The Table 1: Shows Paired T-Test on Pre and Post Treatment of Cranio-vertebral Angle

Paired Samples Test									
		Paired Differences					t	df	Sig. (2 tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	CVA pre-test – CVA post- test	-2.42800	.69348	.31014	-3.28907	-1.56693	-7.829	4	. 001

Table 2 Shows Paired T-Test on Pre and Post Treatment of Neck Disability Index

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	NDI pre-test NDI post-test	6.59000	3.88905	1.73924	1.76111	11.41889	3.789	4	.019

V. DISCUSSION

Since poor postural awareness and persistent bad postures may lead to increased loading on the supporting structure and may produce sensitivity and discomfort, it is commonly acknowledged that poor head posture is one of the causes of neck pain. It is characterized by rounded shoulders, a decrease in the craniovertebral angle, and an increase in anterior cervical convexity. Longus capitis is weak, and there is abnormal shortening of the Levator Scapulae, suboccipital, sternocleidomastoid, and upper trapezius muscles.

According to research by Kim et al., sub occipital release relieves pressure on the vagus nerve that passes via the jugular foramen14. Tissue stretching and foramen tension relief are caused by the traction and pressure of the therapist's fingertips along the posterior area of the neck and sub occipital muscles. This may be the cause of an expanded cervical range of motion and a subsequent decline in pain. At the 2 and 4-week follow-ups, Nagrale et al. showed a substantial reduction in pain intensity in the MET group.[15] According to Rajarajeswaran et al, the MET group saw a considerable decrease in discomfort.[16]

The study results showed that after the application of muscle release the tightness has reduced followed by muscle energy technique on sub occipital and sternocleidomastoid lead to increase in cranio-vertebral angle, improved cervical range of motion and muscle power

VI. CONCLUSION

This study concludes that by the application of muscle release and muscle energy technique on the individuals with forward neck posture and neck pain results in improvement in their CVA and reduction in neck pain. There was noticeable improvement in cervical range of motion and muscle power. Hence, the combination of the two interventions can be effective in managing the forward neck posture and neck pain

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