



# IMPACT OF PHYSIOTHERAPY INTERVENTIONS IN TEXT NECK SYNDROME: A CASE STUDY

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**Abstract:** Background- Text neck syndrome is one of the major cause of neck pain in technologically growing time. It occurs due to prolonged use of mobile phones as well as due the faulty posture. Rounded shoulders are usually present followed by forward head posture, which has been recognized as a major cause of functional impairment. The goal of rehabilitation in text neck syndrome is to reduce the symptoms and restore the functional capacity. The patient treatment should be design depending on the severity, time course and components involved in upper cross syndrome. Since, the lack of recognized treatment algorithm, it must be designed as ergonomic care along with various physiotherapy interventions.

**Case Report-** Twenty-one-year male diagnosed with text neck syndrome followed by cervicogenic headache. The patient head decreased neck muscle strength, limited neck and shoulder range of motion, significant muscle spasm and neck pain. Progressive resistance training along with ergonomic care and routine physiotherapy regimen was given to the patient. Physical therapy intervention improved pain, range of motion and strength of muscles around neck region, decrease spasm and tenderness of the patient as well as aided quick recovery from cervicogenic headache.

**Index Terms -** Text neck syndrome, Neck pain, Cervicogenic headache, Progressive resistance training, McKenzie protocol.

## I. INTRODUCTION

The brain and spinal cord controls a coordinated network of nerves, bones, joints and muscles in the neck, or cervical spine. Pain in the shoulder, arm and hand can also be brought on by irritation along the nerve pathways. The term "text neck" is used to describe the neck pain and injury brought on by excessively and continuously gazing down at a cell phone, tablet, or other wireless device when hunched over these electronic devices, the ultimate effect is "text neck" which is prolonged flexion of the neck. An increase in number of people around the world could be impacted by this ailment, which is a significant health problem (Daniela et al, 2021). Research has revealed that the use of neck specific progressive resistance exercises in chronic neck pain can reduce the pain as well as disability (Laura et al, 2020). Numerous various neck strengthening regimens, such as general strengthening regimens and neck-specific progressive resistance exercises, have been documented. Therefore, the purpose of this case report is to investigate the effects of multidimensional physiotherapy approach including various strengthening regimen such as progressive resistive training on text neck along with cervicogenic headache.

## II. Patient Information And Clinical Finding

A 21-year-old male reported with bilateral neck and upper back pain along with headache since two months on 23/5/2022. Patient experienced moderate dull ache pain that was insidious in onset. Pain worsen with bilateral side flexion and rotation of the neck and prolong mobile use that relieved only by resting or lying in supine position. Patient was diagnosed with text neck syndrome. Patient had no other relevant medical and surgical history. Patient took analgesics to get rid of pain but pain was not resolved which made patient to visit physiotherapy OPD at PGIMS, Rohtak on 23/06/2022.

## III. On Clinical Examination

### Assessments Performed Before Rehabilitation on Day 1

Patient reported pain 6/10 on Numeric Pain Rating Scale. Postural analysis revealed forward head posture along with rounded shoulders. On palpation grade 3 tenderness was there on bilateral upper trapezius, rhomboids as shown in figure1. Temperature was normal and as examined by the goniometer, active range of motion was reduced for the

cervical as well as for the shoulders (Lemeunier et al, 2018). However, muscle strength was also observed reduced on manual muscle testing (Scott et al, 2007). A score of 14/50 was calculated in neck disability index scale (Brian et al, 2009). Spurling test and upper limb tension tests were done and negative signs were observed. Radiological examination revealed normal findings with slight increase in lordotic curve (figure 2).

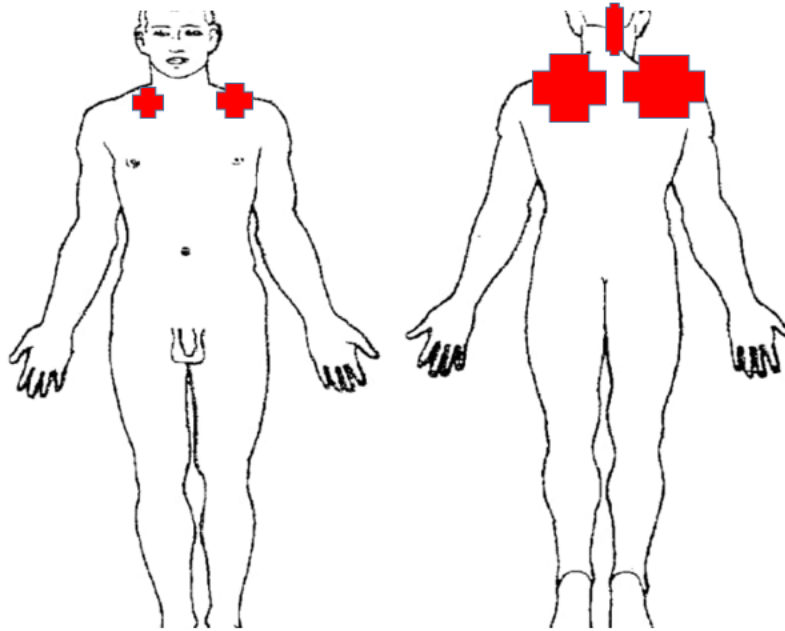


Figure 1. Location of pain



Figure 2. X-ray cervical spine: showing increase in normal lordotic curvature

#### IV. Therapeutic Intervention And Protocol

Goal of the treatment was designed according to international classification of functioning disability and health (ICF). Outcome measures used was Manual Muscle Testing (MMT), Range of Motion (ROM), Numeric Pain Rating Scale (NPRS), Neck Disability Index scale (NDI). Rehabilitation program of 15 days were given to the patient followed by follow up on 3<sup>rd</sup> week as presented in table 1 (a), (b), (c).

##### Clinical Diagnosis and Rehabilitation Programs

Neck pain and headache due to prolonged use of mobile phone were attributed to text neck syndrome along with cervicogenic headache. Physical therapy regimens were offered to address this condition based on the available clinical evidence of Chitale et al. which included progressive resistance training along with stretching and release of trapezius muscle (Chitale et al, 2021).

In addition to these programs, the patient was educated in the pre session on day 1 based on the clinical practice standards for chronic pain. First, explanations were given regarding clinical reasoning, intervention strategies, and anticipated changes in pain following treatment. Second, the patient was also counselled to engage in self-exercising training (trapezius and scalene muscle stretching, deep neck flexors strengthening and postural training exercises) daily, as much as possible. Subsequently, the patient was advised to perform this protocol five times per week.

Table 1. (a) Treatment given for day 1-2

1-2 days	Exercise	Repetition
Pain	<ul style="list-style-type: none"> <li>Modalities (IFT)</li> </ul>	4 pole×10min
Range of motion	<ul style="list-style-type: none"> <li>ROM exercise of shoulder and neck</li> </ul>	10 repetition each
For tenderness	<ul style="list-style-type: none"> <li>Ultrasonic therapy</li> </ul>	Frequency 1 MHZ for 8 min in longitudinal direction of muscle fibers.

Table 1. (b) Treatment given for day 3-8

2-8 days	Exercise	Repetition
Range of motion	<ul style="list-style-type: none"> <li>ROM exercise of shoulder and neck</li> <li>Stretching: MFR upper trapezius, all 3 scalene, sternocleidomastoid, pectoralis muscles (Hakkinen et al, 2007).</li> </ul>	10 repetition each 3 repetition×2 sets and 30 sec hold
For tenderness	<ul style="list-style-type: none"> <li>Ultrasonic therapy</li> </ul>	Frequency 1 MHZ for 8 min in longitudinal direction of muscle fibers.
Strengthening	<ul style="list-style-type: none"> <li>Trapezius upper fibres – shoulder shrugging exercises with holding table</li> <li>Trapezius middle fibres – shoulder horizontal abduction in prone lying position exercises</li> <li>PRE – Upper trapezius, rhomboids (Chitale et al, 2021).</li> </ul>	10 repetition×3 sets and 10 sec hold  10 RM × 3 sets with rest of 1-3 min between sets
Postural training	<ul style="list-style-type: none"> <li>Chin tucking</li> <li>Exercises or cervical retraction exercises</li> </ul>	5 sets with 10 seconds hold 10 repetition with 3sets , 10 sec hold
Home exercise	<ul style="list-style-type: none"> <li>Shoulder retraction exercises</li> <li>Shoulder scaption exercises</li> <li>AROM exercise of cervical spine</li> </ul>	10 repetition

Table 1. (c) Treatment given for day 9-15

8-15 days	Exercise	Repetition
Range of motion	<ul style="list-style-type: none"> <li>Stretching- Upper trapezius, all three scalene, SCM</li> <li>MET- for extensors</li> </ul>	3 repetition×3 sets and 30 sec hold 5-7 sec hold × 10 repetition
Strengthening	<ul style="list-style-type: none"> <li>Trapezius upper fibres – shoulder shrugging exercises with holding table</li> <li>Trapezius middle fibres – shoulder horizontal abduction in prone lying position exercises</li> <li>PRE – Upper trapezius, rhomboids</li> </ul>	10 repetition×3 sets and 10 sec hold  15 RM × 3 sets with rest of 1-3 min between sets
Postural training	<ul style="list-style-type: none"> <li>Cervical retraction exercises-to decrease forward head posture (chin tucking exercises)</li> <li>Scapular retraction exercises-to correcting the rounded shoulder</li> <li>Chin tuck with extension and cervical ROM (Sundeeep, 2003).</li> </ul>	10 repetition with 3 sets , 10 sec hold  5 reps with 10 secs hold
Home exercise	<ul style="list-style-type: none"> <li>Shoulder retraction exercises</li> <li>Shoulder scaption exercises</li> <li>AROM exercise of cervical spine</li> </ul>	15 repetition

## V. Result

When compared pre and post rehabilitation neck and shoulder ROM was increased significantly. The grade of tenderness was reduced to 0 and there was a marked difference assessed for pain related assessment as shown in table 2.

**Summary of Change in the Result of Pain-Related Assessments**  
Table 2. Result of physical therapy and pain related assessments.

	Day 1		Day 8	Day 15	Day 22
	Pre	Post			
Patient assessment ROM					
Neck flexion° Right	30	32	35	38	40
Neck rotation° Right	30	30	35	40	50
Shoulder flexion° Right	165	165	172	180	180
Muscle condition					
Tenderness	+	+	+	-	-
Pain related assesment					
NPRS	6	5	3	1	0
NDI	14	14	10	7	4

Pre and post rehabilitation value for strength of neck and back muscle also showed improvement as presented in table 3 and graphical presentation in figure 3.

Table 3. shows pre and post rehabilitation manual muscle testing of neck and upper back muscles

Neck / Upper back	Pre-rehab MMT	Post-rehab MMT
Capital Flexion	4	5
Capital Extensor	5	5
Cervical Flexion	4	5
Cervical Extension	5	5
Combines Flexion/ Extension	4	5
Rhomboids	4	5
Upper trapezius	4	5

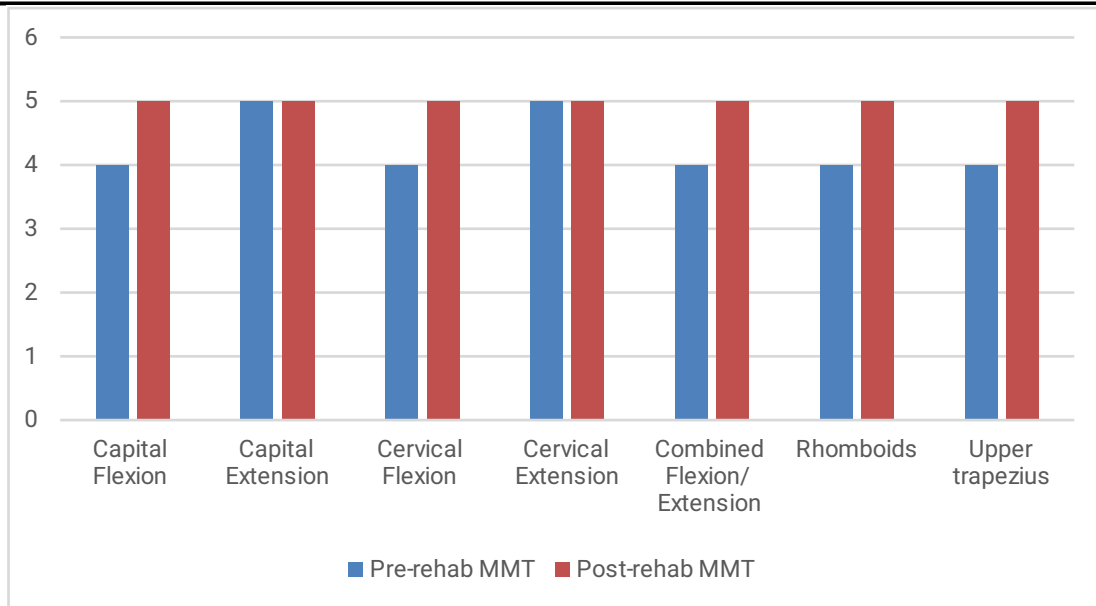


Figure 3. Graph representing pre and post manual muscle testing scores of neck and upper back muscles.

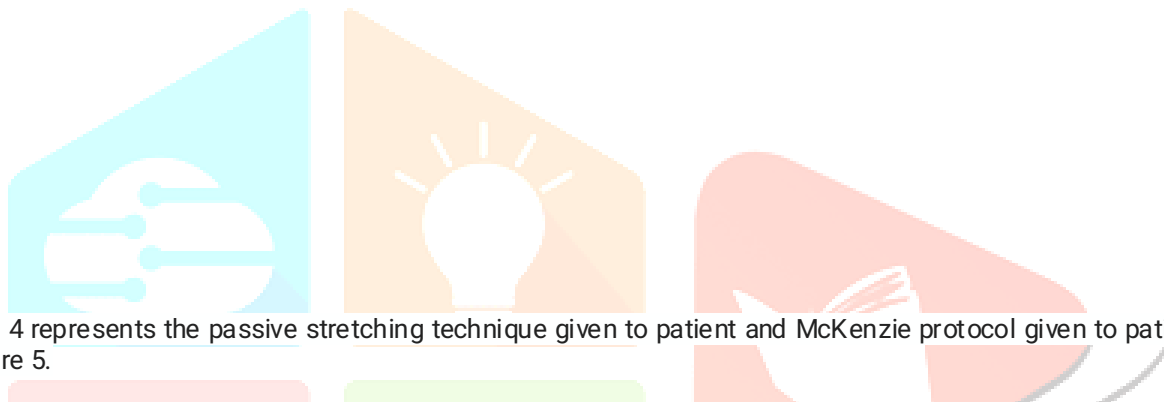


Figure 4 represents the passive stretching technique given to patient and McKenzie protocol given to patient is shown in figure 5.

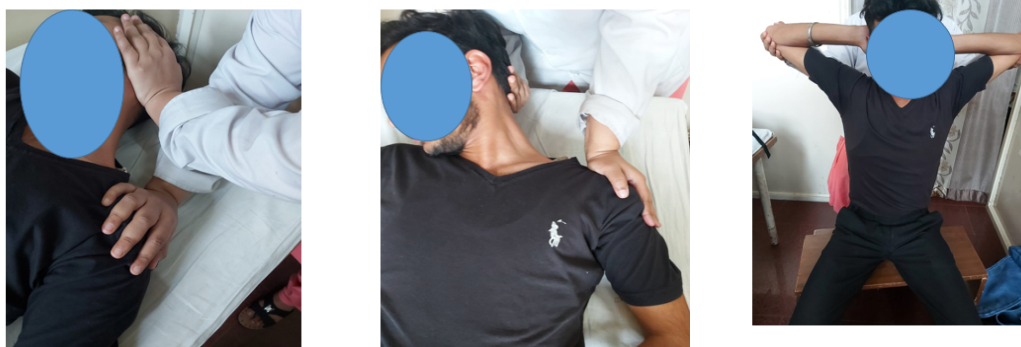


Figure 4. Passive stretching



Figure 5. McKenzie protocol

**VI. Discussion**

In the present case of a patient who demonstrated neck and upper back pain, experienced severe pain due to prolonged use of mobile phone. We selected strategies like evidence-based physiotherapy and guideline-based medical communication based on the clinical reasoning and supporting data. This case study explored commendatory results of multi-dimensional physiotherapy approach including PRE in case of text neck syndrome

patient reported improvement in pain, range of motion, and headache in three weeks' protocol. The rationale for finding is supported by evidence supporting strengthening of deep neck flexors, rhomboids and stretching of trapezius and pectoral muscles help in correction of forward head posture. PRE along with conventional physiotherapy protocol best suited for text neck syndrome similar to previous studies reference. Future research should consider the individual effect of progressive resistive training and comparison between conventional and McKenzie protocol can be done.

## VII. Conclusion

The 3 weeks of progressive resistive exercises along with conventional physiotherapy showed significant improvements in pain, range of motion as well as in strength in text neck patient. PRE training was found to effectively improve the numeric pain rating scale (NPRS) and neck disability index scale (NDI). Therefore, it can be concluded that PRE along with conventional treatment will be beneficial in text neck syndrome along with cervicogenic headache. The muscles capacity to generate force can be enhanced by performing PRE. Because it has health advantages, it can be a useful intervention in physiotherapy.

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