

Effect of Myofascial Release and Postural Correction in Cervicogenic Headache Associated with Forward Head Posture: A Single Case Study

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Abstract:

➤ *Background:*

Cervicogenic headache is a secondary headache arising from dysfunction of the cervical spine and associated musculoskeletal structures. Forward head posture is commonly associated with cervicogenic headache and may contribute to increased mechanical stress on cervical muscles, reduced craniovertebral angle, pain, muscle tightness, and functional disability. Physiotherapy interventions such as myofascial release and postural correction exercises are commonly used to improve symptoms and posture.

➤ *Case Presentation:*

A 26-year-old female presented with cervicogenic headache associated with forward head posture. The patient complained of bilateral headache shifting from right to left side, neck pain, stiffness, and difficulty maintaining prolonged sitting posture for the past 5 years. Symptoms increased during prolonged studying, mobile/ laptop use. Assessment revealed forward head posture, rounded shoulders, reduced craniovertebral angle, tenderness, reduced cervical mobility, and functional disability. The patient underwent physiotherapy intervention for 4 weeks consisting of myofascial release for upper trapezius, levator scapulae, and suboccipital muscles along with postural correction exercises including chin tuck exercise, scapular retraction exercise, and pectoralis stretching. Following intervention, pain intensity reduced from 7/10 to 2/10 on Numerical Pain Rating Scale (NPRS), Neck Disability Index (NDI) improved from 48% to 15%, and craniovertebral angle improved from 44° to 53°. Improvement in posture, cervical mobility, and functional activities was also observed.

➤ *Conclusions:*

The case study findings suggest that myofascial release combined with postural correction exercises may be effective in reducing pain, improving posture, decreasing disability, and enhancing functional ability in patients with cervicogenic headache associated with forward head posture. Further studies with larger sample sizes and long-term follow-up are recommended to establish stronger evidence regarding the effectiveness of these physiotherapy interventions.

Keywords: Cervicogenic Headache, Forward Head Posture, Myofascial Release, Postural Correction, Craniovertebral Angle, Physiotherapy, Case Study.

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I. INTRODUCTION

Headache is one of the most common neurological complaints affecting individuals worldwide, significantly impacting quality of life and functional ability¹. Among the various types of headaches, cervicogenic headache (CGH) is a distinct secondary headache disorder originating from

dysfunction in the cervical spine and its associated structures¹. Cervicogenic headache is a type of secondary headache that caused problems in the musculoskeletal system of the cervical spine². According to the International Headache Society (IHS), ‘‘Cervicogenic headache is defined as a secondary headache, which means a headache caused by a disorder of the cervical spine and its component bony,

disc and soft tissue elements, usually but not invariably accompanied by neck pain³. The pain is commonly felt in the temporal region and may radiate to the occipital, frontal, and orbital areas, often accompanied by decreased cervical range of motion⁴. It is characterized by unilateral pain originating from the back of the head and neck on side, progressing forward and occasionally causing discomfort in the arm on the same side⁵.

Forward head posture is associated with weakness of the deep cervical flexors and shortening of the opposing cervical extensor muscles. FHP results in an increased cervical lordotic curve in the lower cervical region, causing relative extension in the upper cervical spine and flexion in the lower cervical spine. This altered alignment is associated with a reduced craniovertebral angle⁶. Myofascial release is a form of manual therapy, has been widely used in clinical practice which aimed at relieving tension within the fascia and improving musculoskeletal function⁷.

The objectives of MFR are to influence physiological function correct imbalances and progress in a balanced state by relieving facial restrictions thus normalizing health, reducing tension and improving body movement⁶. Myofascial release techniques are designed to normalize the length of restricted tissues, leading to pain reduction and improved functional performance. It is widely recognized as a safe and effective intervention involving the application of sustained pressure to promote pain relief and mobility. Physical therapy primarily aims to decrease the frequency and severity of headaches, evaluate musculoskeletal issues and enhance patient's ability to manage their condition independently⁸.

Disability Index (NDI) for functional status, craniovertebral angle (CVA) for postural assessment, cervical range of motion (CROM) for mobility, and the Flexion Rotation Test (FRT) for upper cervical dysfunction. These outcome measures have demonstrated strong reliability and validity and are widely used in clinical and research settings to monitor patient progress and treatment outcomes in cervicogenic headache.^{9,10,11}

Therefore, this study aims to evaluate the effect of myofascial release combined with postural correction in individuals with cervicogenic headache associated with forward head posture.

II. CASE STUDY

A 26-year-old female student presented with complaints of headache for the past 5 years. The pain originated in the neck and radiated to the occipital and frontal regions. Headache was aggravated by prolonged studying, prolonged mobile phone use, weather changes, and crowded public places. On observation, forward head posture, rounded shoulders, and mild scapular protraction were noted. Tenderness was present over the upper trapezius, levator scapulae, and suboccipital muscles. There was decreased cervical range of motion in all direction.

➤ Outcome Measures

Outcome measures included NPRS, NDI, and CVA. Pre-treatment score for NPRS to measure the intensity of pain was 7/10. Similarly, the NDI was used to measure the functional disability of neck that revealed 48% indicating moderate disability and Craniovertebral angle was 45°.

III. INTERVENTION

The intervention program was conducted for 4 weeks, 3 sessions per week with the aim to reduce trigger point, improve posture, and enhance cervical mobility. Each session lasted approximately 30–40 minutes. The intervention program included:

- *Myofascial Release for upper trapezius, levator scapulae and suboccipital release*
- *Postural Correction Exercises:*
 - Chin tuck exercises (3 sets × 12 repetitions)
 - Scapular retraction exercises (3 sets × 12 repetitions)
 - Pectoralis stretching (10 repetitions with 10-second hold)

IV. RESULTS

Following 4 weeks of intervention, significant improvement was observed. NPRS improved from 7/10 to 2/10, NDI improved from 48% to 15%, Craniovertebral angle improved from 45° to 53° with improve in cervical ROM in all direction. Tenderness in trigger point areas significantly reduced post-treatment. The patient also demonstrated improved posture and reduced forward head posture.

V. DISCUSSION

The present case study was conducted to evaluate the effect of myofascial release and postural correction exercises in a patient with cervicogenic headache associated with forward head posture. Following 4 weeks of physiotherapy intervention, improvement was observed in pain intensity, functional disability, and cervical posture. Reduction in pain intensity was observed through improvement in Numerical Pain Rating scale (NPRS) score from 7/10 to 2/10. The reduction in pain may be due to the effect of myofascial release in reducing facial restriction, and improving soft tissue mobility in the cervical region. A similar study was conducted by Ana Youso, Dua Qazi et al. (2024) compared the efficacy of Myofascial Release (MFR) and Proprioceptive Neuromuscular Facilitation (PNF) techniques in patients with cervicogenic headache. The study concluded that both interventions were effective; however, MFR showed superior improvement in pain reduction, cervical range of motion, and functional disability. These findings are consistent with the present study, where reduction in pain and improvement in cervical mobility and Neck Disability Index (NDI) scores were observed following MFR intervention⁸.

In the current study, improvement in functional disability was demonstrated by reduction in NDI score from 48% to 15%. Postural correction exercises including chin

tuck, scapular retraction, cervical stretching, and pectoralis stretching may have improved cervical alignment and improving daily functional activities. An increase in the craniovertebral angle from 44° to 53° indicated improvement in forward head posture as well. Forward head posture increases stress on cervical muscles and joints, contributing to cervicogenic headache.¹² Correction of posture and strengthening of deep neck flexors may therefore help reduce mechanical stress and improve postural stability. The findings of the present study are also supported by the study conducted by Deepanshi Singh et al. (2024), which concluded that strengthening rehabilitation exercises were effective in reducing pain, neck impairment, and improving quality of life in patients with cervicogenic headache. Similar improvements in pain reduction and functional ability were observed in the present case study following postural correction exercises. Reduction in tenderness and muscle tightness was also noted following intervention. Tightness in upper trapezius, levator scapulae, sternocleidomastoid, and pectoralis muscles reduced after treatment, suggesting improved flexibility and muscle relaxation¹³.

A study conducted by Marwa Shafiek Mustafa Saleh et al. (2023) compared suboccipital release technique and muscle energy technique in patients with forward head posture and mechanical neck pain. The study concluded that both techniques improved pain and craniovertebral angle. Similar improvement in posture and pain reduction was observed in the present study following suboccipital release and postural correction exercises¹³.

Maryam Shabbir, Saba Rafique et al. (2021) reported that suboccipital myofascial release was more effective than cervical mobilization in improving neck disability, pain, and cervical range of motion in cervicogenic headache patients. Similar improvements in disability and ROM were noted in the present case study. The present study was limited to a single patient¹⁴.

VI. CONCLUSION

The present case study concluded that 4 weeks of physiotherapy intervention including myofascial release technique combined with postural correction exercises is effective in the management of cervicogenic headache associated with forward head posture.

Improvement in craniovertebral angle indicated correction of forward head posture, while reduction in VAS and NDI scores demonstrated decreased pain and disability. The combined intervention also helped improve postural awareness and functional performance during daily activities.

Therefore, myofascial release and postural correction can be considered as an effective physiotherapy approach for reducing symptoms and improving posture in patients with cervicogenic headache associated with forward head posture.

VII. GRAPHS AND CHARTS

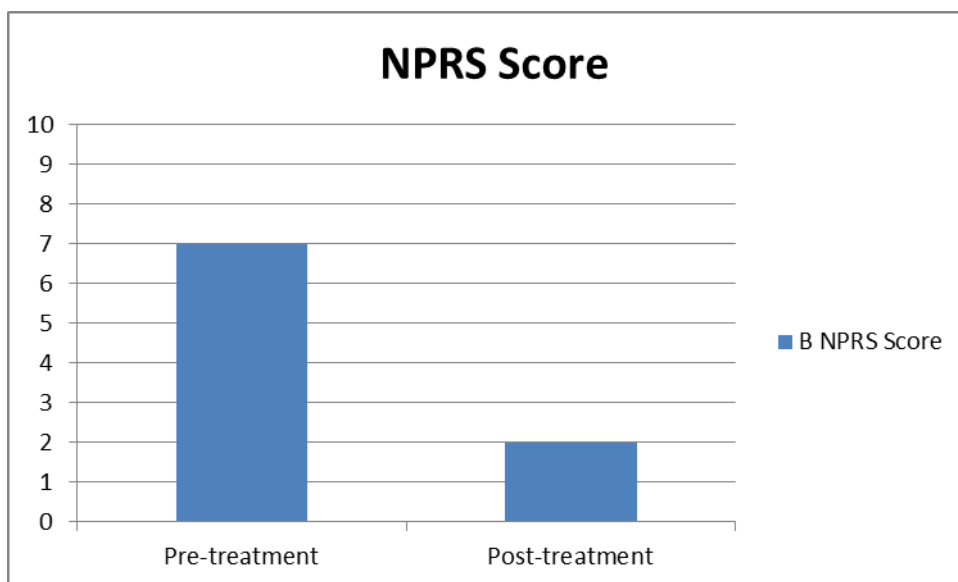


Chart 1: Comparison of Pre-Treatment and Post-Treatment NPRS(Numerical Pain Rating Scale) Scores Showing Reduction in Pain Intensity after Physiotherapy Intervention

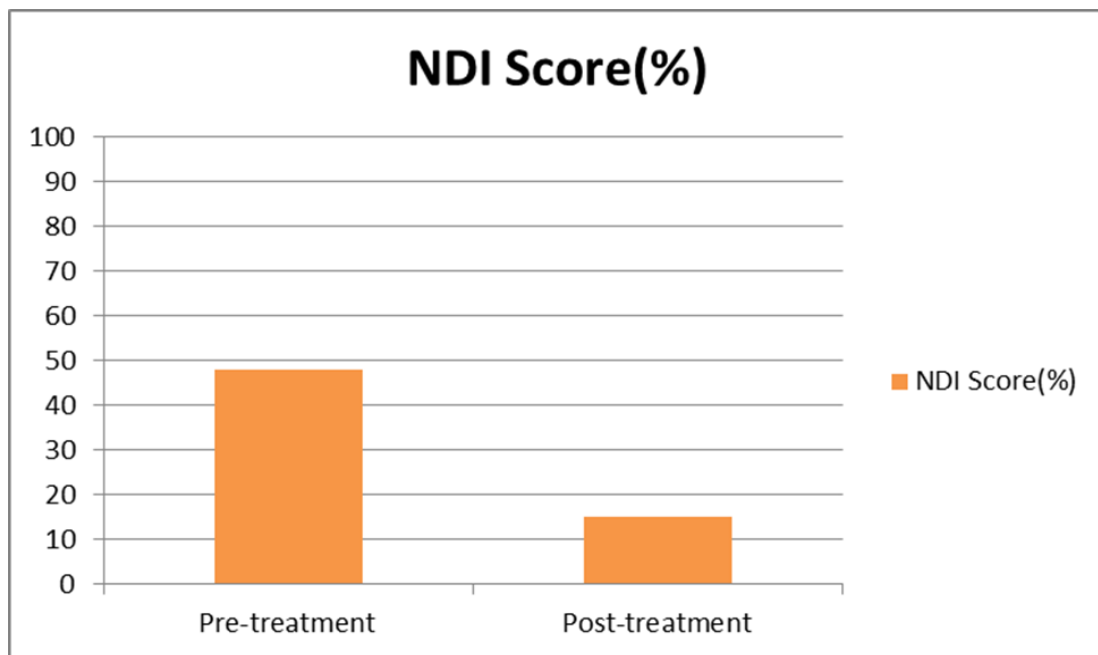


Chart 2: The Neck Disability Index (NDI) Score Decreased from 48% During Pre-Treatment to 15% During Post Treatment, Indicating Improvement in Neck Function after Treatment.

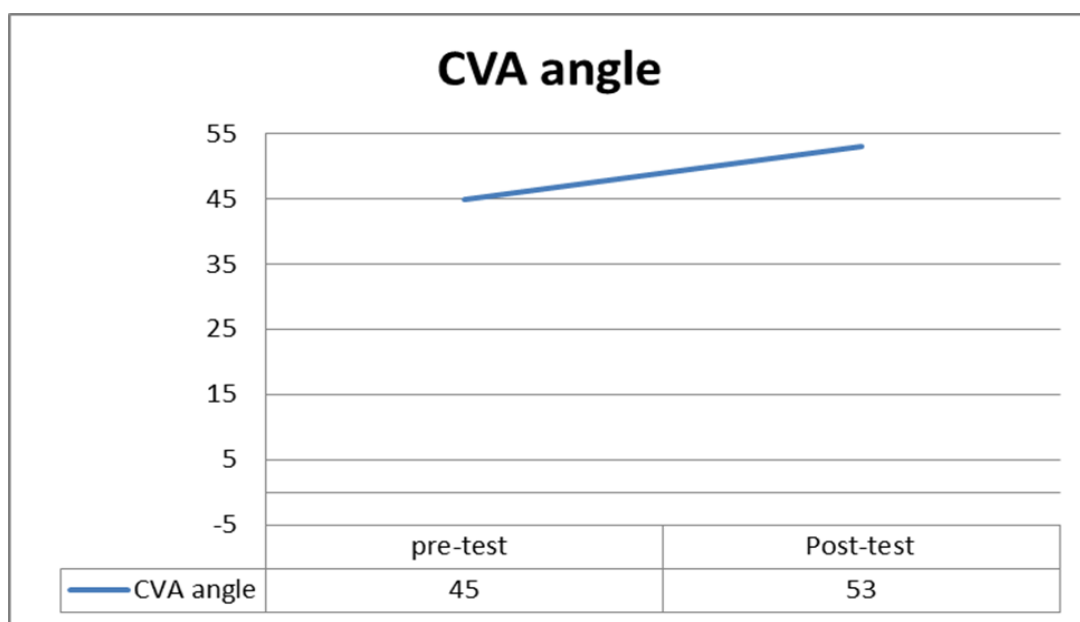


Chart 3: The Craniovertebral Angle (CVA) Increased from Pre-Treatment to Post-Treatment, Indicating Improvement in Forward Head Posture Following Physiotherapy Treatment.

VIII. LIMITATIONS

- The study was conducted on a single patient.
- Long-term follow-up was not performed.
- Results cannot be generalized to a larger population.
- Psychological and ergonomic factors were not extensively evaluated.

- Comparative studies with other physiotherapy interventions can be performed.
- Ergonomic and workplace modifications may also be included in future studies.

IX. FUTURE RECOMMENDATIONS

- Studies can be conducted with larger sample sizes.
- Long-term follow-up studies are recommended.

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