

Effectiveness of Cervical Stretching Combined with Cervical Strengthening Exercises on Pain and Disability in a Patient with Migraine: A Case Study

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ABSTRACT

Background: Frequent headache attacks and the functional impairment they cause define migraine, a prevalent neurological condition. Migraine sufferers may be at increased risk for cervical musculoskeletal problems. Physiotherapy interventions targeting the cervical region may help reduce pain and disability.

Objective: To evaluate the effectiveness of cervical stretching combined with cervical strengthening exercises on pain intensity and migraine-related disability in a patient with migraine.

Methodology: A case study was conducted on a 22-year-old male diagnosed with migraine. The patient underwent a four-week intervention consisting of cervical stretching and cervical strengthening exercises. The Visual Analogue Scale was used to quantify pain intensity, and the Migraine impairment Assessment Scale was used to measure impairment linked to migraines both before and after the intervention.

Results: Following four weeks of intervention, improvements were observed in both pain intensity and disability. From 8 out of 10 before therapy to 6 out of 10 after treatment, the Visual Analogue Scale score dropped. The Migraine Disability Assessment Scale score improved from

moderate disability (score range: 11–20) to mild disability (score range: 6–10).

Conclusion: Cervical stretching combined with cervical strengthening exercises improved pain intensity and migraine-related disability in this patient with migraine. These exercises may be considered as an adjunct physiotherapy intervention in the management of migraine.

Keywords: Migraine, cervical stretching, cervical strengthening, pain, disability, case study.

INTRODUCTION

Migraine is a common chronic neurological disorder characterized by recurrent episodes of headache associated with nausea, vomiting, photophobia, and phonophobia. It is a major cause of disability worldwide, particularly among young and middle-aged adults, contributing significantly to functional impairment^[1].

The pathophysiology of migraine involves neurovascular mechanisms, including activation of the trigeminovascular system and release of neuropeptides, leading to pain transmission and neurogenic inflammation. Central sensitization and cortical spreading depression also contribute to migraine attacks^[2].

A functional connection between the trigeminal system and the upper cervical spine through the trigeminocervical complex may explain the association between migraine and cervical musculoskeletal dysfunction. People who suffer from migraines often have difficulties with their cervical spine, including stiffness and limited mobility^[3,4]

Although pharmacological treatment is commonly used, recurrence of symptoms and persistent disability remain common. This has increased interest in physiotherapy interventions targeting cervical dysfunction as adjunct management strategies. Cervical stretching and strengthening exercises have been reported to improve cervical function and reduce headache symptoms^[5,6,].

Nevertheless, there is a lack of information about the efficacy of combining cervical stretching and strengthening exercises for the treatment of migraines on an individual basis. As a result, the purpose of this case study was to assess the impact on disability and pain levels of cervical stretching and strengthening exercises administered to a migraine patient.

OBJECTIVE

To evaluate the effectiveness of cervical stretching and strengthening exercises on pain intensity and migraine-related disability in a young male patient with migraine.

ASSESSMENT

A 22 years old male patient with a history of recurrent migraine headaches since the age of 10 years. His first episode was characterized by severe headache associated with vomiting. The episode was intense, and the patient reported inability to turn the head, sit, stand, or even lie comfortably during attacks. At that time, there was no particular element that alleviated the pain. After seeing a doctor, the patient was given medicine to alleviate their migraine symptoms. Unfortunately, the patient's migraine bouts persisted at about once a month, and there was no discernible improvement. The patient's migraine bouts were less frequent when he was 16 years old,

although he still had some symptoms. A lack of sleep, abrupt changes in the weather (such moving to a new place), and direct sunshine were all listed as potential migraine triggers. Another event accompanied by a strong headache and vomiting happened one month before this examination. There was no reported history of head injury, neurological illness, or other systemic conditions. The patient did not report any previous surgical history. Following clinical evaluation, the patient was taken up for physiotherapy intervention focusing on cervical stretching and strengthening exercises aimed at reducing pain intensity and improving functional disability associated with migraine.

MATERIALS AND METHODS

Study design: Case study.

Materials used: Visual Analogue Scale (VAS), Migraine Disability Assessment Scale (MIDAS), and treatment couch.

Procedure:

A patient diagnosed with migraine was selected for the study. The study procedure was explained to the patient, and written informed consent was obtained prior to participation. Pre intervention assessment of pain intensity and disability was performed using the Visual Analogue Scale (VAS) and Migraine Disability Assessment Scale (MIDAS). The patient was then put through a series of cervical strengthening and stretching exercises as part of a supervised physiotherapy intervention program. Over the course of four weeks, participants met three times for the intervention, with each session lasting around twenty to thirty minutes. After the treatment period ended, the same outcome measures were used to conduct a post-intervention evaluation in order to determine the intervention's efficacy.

Intervention:

The intervention program included cervical stretching and strengthening exercises targeting cervical musculoskeletal dysfunction. Cervical stretching exercises

were applied to the upper trapezius, levator scapulae, and sternocleidomastoid muscles. Each stretch was held for 30 seconds and repeated three times bilaterally to improve muscle flexibility and reduce cervical muscle tension.

Cervical strengthening exercises included deep neck flexor training (chin tuck exercises), isometric strengthening of cervical flexors, extensors, side flexors, and rotators, and scapular stabilization exercises. Isometric exercises were performed against manual resistance without cervical

movement, with 10 repetitions and a 5-second hold per repetition. The combined program aimed to improve cervical flexibility, strength, posture, and neuromuscular control, thereby reducing mechanical stress on cervical structures.

Outcome measures:

- Visual Analogue Scale (VAS)
- Migraine Disability Assessment Scale (MIDAS)

RESULTS

Outcome Measures	Pre Intervention	Post Intervention
Pain Intensity (VAS)	8/10	6/10
Disability (MIDAS)	13	10

At pre-intervention, the patient reported a pain intensity of 8/10 on the Visual Analogue Scale (VAS). The Migraine Disability Assessment (MIDAS) score was within the moderate disability range (11–20), that is 13 indicating a moderate impact of migraine on daily activities. Following 4 weeks of cervical stretching and strengthening exercises, the patient's pain intensity decreased to 6/10 on the VAS. The MIDAS score also improved, falling within the mild disability range (6–10) that is 10. These findings indicate a positive response to the intervention. After 4 weeks of treatment, the patient demonstrated a reduction in pain intensity and migraine-related disability, suggesting improved functional status and better management of migraine symptoms.

DISCUSSION

This case study looked at how a migraine sufferer's discomfort and handicap were affected by a regimen of cervical stretching and strengthening exercises. Results indicate that some migraine sufferers who also have cervical dysfunction may benefit from exercise-based physiotherapy.

The improvement observed may be explained by the influence of cervical musculoskeletal dysfunction on headache mechanisms. Cervical muscle tightness and reduced mobility can alter afferent input

from upper cervical structures, potentially contributing to headache generation [7]. Previous studies have reported the presence of myofascial dysfunction and trigger points in migraine, which may exacerbate pain perception [8]. Exercise-based interventions may help reduce such dysfunction by improving flexibility and muscle function.

The trigeminocervical convergence mechanism provides a plausible neurophysiological explanation for these effects, where nociceptive input from cervical structures influences trigeminal pathways involved in headache processing [9]. By improving cervical biomechanics, stretching and strengthening exercises may reduce peripheral nociceptive input and modulate headache symptoms [10].

The findings are consistent with previous clinical research supporting cervical and exercise-based interventions in migraine management. Randomized controlled trials have demonstrated that cervical strengthening and stabilization exercises can reduce headache intensity and improve functional outcomes in migraine patients [5]. Similarly, stretching based interventions have been shown to reduce pain intensity and improve cervical range of motion [12]. Systematic reviews further support the role of physiotherapy interventions as adjunct approaches in headache disorders [11].

However, variability in outcomes across studies may be influenced by differences in exercise protocols, duration of intervention, and patient selection [7]. Some studies emphasize multimodal approaches combining strengthening, stabilization, and manual therapy for better outcomes [11].

Despite these positive observations, the present findings should be interpreted with caution. As a single-case study, the results cannot be generalized to a wider population. Both the lack of a control group and the very brief follow-up period make it difficult to draw any firm conclusions about the study's long-term efficacy.

The best way to treat migraines using cervical exercise-based therapies is to do bigger controlled studies to find out how much exercise is necessary, how to go through the exercises, and which patient subgroups will benefit the most.

Overall, this case provides preliminary support for the use of cervical stretching and strengthening exercises as an adjunct physiotherapy approach in migraine associated with cervical dysfunction.

CONCLUSION

Cervical stretching and strengthening exercises appeared to reduce pain intensity and migraine-related disability in this patient with migraine. The findings suggest that cervical exercise-based Physiotherapy may serve as a supportive intervention in the management of migraine associated with cervical musculoskeletal dysfunction.

However, as this was a single-case study with a short intervention period and no long-term follow-up, the results cannot be generalized to the broader migraine population. Further studies with larger sample sizes and controlled designs are required to confirm these findings and establish long-term effectiveness.

Declaration by Authors

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