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Migraine resolution in a patient receiving Cox® flexion-distraction and thoracolumbar spinal manipulative therapy: a case report

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Objective: *This case report describes the use of flexion-distraction as a chiropractic treatment for a 46-year-old woman experiencing acute-onset migraine headaches.*
Clinical features: *A 46-year-old woman with acute-onset migraine headaches sought an evaluation at our chiropractic clinic. She reported experiencing 10 headaches per month for the past two months. Prior to visiting our clinic, she consulted several doctors and tried several medications for relief of her migraine headaches.*

Intervention and outcome: *A trial of conservative care using flexion-distraction was applied to the cervical spine as a primary intervention for managing her acute migraine headaches, along with the application of thoracolumbar spinal manipulation. After 13 sessions over six weeks, the patient reported less pain, a notable*

Résolution de la migraine chez une patiente recevant une thérapie par manipulation vertébrale thoracolombaire et en flexiondistraction Cox®: un rapport de cas
Objectifs: *Ce rapport de cas décrit l'utilisation de la flexiondistraction comme traitement chiropratique pour une femme de 46 ans atteinte de migraines aiguës.*

Caractéristiques cliniques: *Une femme de 46 ans atteinte de migraines aiguës a demandé une évaluation à la clinique chiropratique. Elle a déclaré avoir éprouvé 10 maux de tête par mois au cours des deux derniers mois. Avant de se rendre à la clinique, elle a consulté plusieurs médecins et a essayé plusieurs médicaments pour soulager ses maux de tête.*

Intervention et résultats: *Un essai de traitements conservateurs au moyen de la flexiondistraction a été appliqué à la colonne cervicale comme intervention principale pour gérer ses migraines aiguës, en plus de l'utilisation de la manipulation de la colonne thoracolombaire. Après 13 séances sur six semaines, la patiente a signalé une diminution de la douleur, une diminution notable de la fréquence de ses migraines*

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decrease in the frequency in her migraine occurrences and in her use of pain medication, increased sleep, and an improved mood.

Summary: *The flexion-distraction chiropractic approach effectively managed acute migraine headaches in a middle-aged woman.*

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KEY WORDS: classic migraine, headache, case report, chiropractic, spinal, manipulation, flexion-distraction

et de son utilisation de médicaments contre la douleur, une augmentation du sommeil et une amélioration de l'humeur.

Résumé: *L'approche chiropratique de flexiondistraction a efficacement géré les migraines aiguës chez une femme d'âge moyen.*

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MOTS CLÉS : migraine classique, mal de tête, rapport de cas, chiropratique, vertébrale, manipulation, flexiondistraction

Introduction

Migraine represents one form of primary headache without an identifiable cause, but several theoretical models of causation have been proposed, as discussed below. Notably, the one-day prevalence of headache suggests that 15.8% of the global population have a headache, and almost half of them (7%) have a migraine.[1] The World Health Organization (WHO) recognizes migraines as a major public health concern due to their high prevalence and substantial societal costs in terms of healthcare expenses and lost productivity.[2,3] Symptoms of migraine can include nausea, vomiting, photophobia and phonophobia.[3]

Research has revealed some mechanisms for the cause of migraines, such as neck pain, cutaneous allodynia, and nausea.[4-6] Neck pain has been reported as a common trigger for migraine,[4] and is also frequently reported with cervicogenic headaches, a secondary headache type arising from cervical spine issues, with a prevalence of 4.1%.[7] Cervicogenic headaches are often caused by cervical facet arthropathy and occipital neuralgia, resulting in neck pain that radiates to the head.[8] While migraines and cervicogenic headaches are distinct, neck pain is a common feature of both.[2,9-11] Cutaneous allodynia can accompany a migraine and is considered a clinical manifestation of central nervous system sensitization. It is characterized by pain triggered by skin stimulation that would normally not be painful.[5] Nausea is a common symptom of migraine.[6] Research has indicated that nausea can occur as a premonitory symptom in migraines, independent of pain and trigeminal activation.[6] In addition, the clinical presentation of migraine evolves over a person's lifespan. For example, childhood migraines tend to be of shorter duration and may include symptoms such as vomiting, abdominal pain and vertigo, while older adults often experience fewer autonomic symptoms and often have bilateral headaches.[12]

Traditional management of migraines primarily involves pharmacological interventions, which may not always be effective and can lead to adverse side effects.[13,14] Chiropractic care has emerged as a potential non-pharmacological intervention for migraine relief.[13,14] Spinal adjusting involves applying controlled force, leverage, direction, amplitude, and velocity to specific joints and nearby tissues, which includes manual therapies, instruments such as activators, pelvic blocks, specialized tables, such as drop and traction tables, and other low-force methods. A subset of this is spinal manipulative therapy, which involves high velocity, low amplitude (HVLA) thrusts that usually cause joint cavitation.[15] Chiropractic treatment focuses on the manual adjustment or manipulation of the spine. There are several theories explaining its effectiveness, with one suggesting that spinal alignment affects overall physical health, including headache management.[16] A study has shown a high prevalence of musculoskeletal dysfunctions in individuals with migraine, which suggests that cervical muscular dysfunction may be associated with migraine symptoms.[17] The Cox® Technic Flexion-Distraction method, a chiropractic joint manipulation and mobilization technique, is used for conditions such as cervical radiculopathy, cervical spine disorders, and low back pain.[18-21]

The objective of this case report is to chronicle the successful management of a patient presenting with acute migraines using Cox® Flexion-Distraction and thoracolumbar HVLA-SMT.

Case presentation

The patient consented to the authors chronicling the details of her case (consent form available upon request). A 46-year-old female, who had recently started experiencing acute-onset migraine headaches, sought an evaluation at a private chiropractic clinic. Her headaches had been ongoing for approximately four months at a frequency of approximately one episode per week. She has no history of previous migraines. She reported that her headaches were accompanied by symptoms of nausea along with photophobia and phonophobia. She also reported experiencing visual field disturbances, described as an aura, before the onset of the headache. The patient reported waking up with a headache, which would intensify as the day progressed. Her headaches persisted throughout the day and required time off from work and rest. The patient reported no slips, falls, other precipitating trauma, or other exacerbating factors that might have been linked to these cephalalgic episodes.

System review was unremarkable other than idiopathic scoliosis during adolescence, which was successfully treated with a Milwaukee brace. The patient reported that she had received chiropractic treatment in the past for her scoliosis and for the occasional back ache. She reported that these treatments were always effective. She has no family history of migraine or major diseases. She was not taking any medications and was not being monitored for any other health conditions. She reported that she does not smoke, drink alcohol, use cannabis, or exercise. She described herself as a picky eater, with normal sleep patterns, and no known allergies. She works as a librarian at a school and is a married mother with two children.

The patient first tried over-the-counter medication (Excedrin for migraine), with no symptomatic relief. She then went to her primary care physician, who referred her to a neurologist. She was under the care of a neurologist prior to presenting to the chiropractic clinic and had been prescribed standard migraine pharmacotherapy, (sumatriptan), which provided minimal symptomatic relief. Neuroimaging, including brain scans, did not reveal any pathological abnormalities. The patient did not have any positive cervical orthopedic signs that would justify a radiograph. Due to the patient's budget constraints, magnetic resonance imaging (MRI) was not ordered. Additionally, Blue Cross and Blue Shield of Nebraska requires six weeks of conservative care before approving an MRI. Consequently, the patient recovered before an MRI would have been covered by her insurance.

At the time of her initial evaluation, her pain intensity, as quantified using the Visual Analog Scale (VAS), was significant, registering a score of 9 out of 10. A comprehensive assessment using the Migraine Disability Assessment Scale (MIDAS)[22] yielded a score of 28, indicating severe functional impairment caused by the migraines.

Treatment

After a discussion about the proposed treatment, the patient provided consent for the doctor to proceed with the proposed management plan (consent form available upon request). The patient received a series of treatments utilizing the Cox® Technic Flexion Distraction Decompression (CTFDD) long Y-axis cervical spine flexion-distraction, Protocol 1.[23] She was positioned prone on the Cox®8 Table for these sessions (see Figure 1). The treatment protocol (Protocol 1)[23] involved applying long Y-axis traction to the upper cervical spine contacting the occiput only. This was executed in a slow manner, in four-second pumps. Each set consisted of five repetitions, and three sets were completed during each visit. The thoracic and lumbopelvic spine was treated using HVLA-SMT based on pain on palpation with static palpation. Additionally, compensatory issues in the rest of the spine that were related to the prior scoliosis were addressed as required in each session.

The treatment schedule was initially intensive, with the patient receiving therapy three times a week for the first two weeks. This was then tapered to bi-weekly sessions for the following two weeks and was eventually transitioned to a maintenance phase of once-weekly visits. The patient received treatment 13 times over six weeks. The patient was discharged from care with instructions to follow-up as needed.

Outcome

Upon follow-up evaluation after having undergone six weeks of chiropractic treatment using the Cox® CTFDD long Y-axis cervical spine flexion-distraction, Protocol 1,

Figure 1.
The patient is positioned prone on the Cox®8 Table.

the patient reported a marked improvement in her symptoms. The VAS score had reduced significantly from an initial score of 9 to a score of 2 out of 10. The MIDAS assessment correspondingly improved from an initial score of 28 to a score of 4, suggesting minimal to no disability. During the chiropractic treatment period, the patient was not receiving any other medical or pharmacological treatment that could have provided an alternate explanation for the improvement in her symptoms. At three- and six-months follow-up, the patient indicated a substantial reduction in the frequency of her migraine headaches, with the patient reporting only two instances of tension-type headaches and no migraines since the completion of the treatment protocol.

Discussion

This case report describes the successful use of chiropractic therapy which included using the Cox® CTFDD long Y-axis cervical spine flexion-distraction, Protocol 1, for the treatment of migraine headache. The patient's symptoms improved following treatment that focused on Cox® flexion-distraction of the cervical spine. The authors attribute this improvement to the reduction of the upper cervical spine discs through flexion and distraction, suggesting a potential link between these discs and the occurrence of migraines.

It is important to note that the cervical region contains anatomical and physiological mechanisms that enable referral of pain to the head, including the frontal regions of the head, and can extend to the orbit in patients who experience pain originating from these neck structures.[10]

Several studies have investigated the possible mechanisms of action for the beneficial effects of chiropractic therapy to the cervical spine in treating headaches.[24,25] Research suggests that spinal manipulation may be effective in treating some headache types, particularly tension-type headaches and migraines.[13,26,27] For example, manual therapy using cervical flexion-distraction was effective in reducing neck and thoracic pain as well as in reducing headache frequency in a 21-year-old with neurofibromatosis type 1.[28] In addition, a reduction of headaches and neck pain was observed in a patient with a prior spinal fusion from C4-C7 using Cox® CTFDD spinal manipulation.[29] Another case report detailed a patient with left shoulder, arm, and neck symptoms due to a C6/C7 left posteromedial disc herniation, who showed symptom relief following Cox® flexion-distraction to the cervical spine.[18] In addition, Cox® flexion-distraction decompression manipulation was used on a patient with radiculopathy from a C6/C7 disc herniation, leading to a positive clinical outcome. This improvement was confirmed by pain scale and objective examinations, even at the two-year follow-up.[19]

However, the evidence supporting chiropractic care for migraines remains a subject of ongoing research and debate. While some studies suggest a beneficial effect of chiropractic interventions on migraine frequency, intensity, and duration,[30,31] others call for more rigorous research to establish clear clinical guidelines.[14] A systematic review of randomized controlled trials has found that massage therapy, physiotherapy, relaxation, and chiropractic spinal manipulation therapy might be as effective as medications in managing migraines.[10] The author points out that these conclusions need to be evaluated through well-conducted randomized controlled trials.[10] Additionally, a meta-analysis and systematic review has found that spinal manipulation might be an effective technique to

reduce the duration and pain of migraines, though large-scale randomized controlled trials are needed to confirm this finding.[15]

It is important to point out that current research on cervical impairments in migraine sufferers is limited and complicated by varying underlying causes of neck pain and the influence of hypersensitivity.[32] Research indicates that there are identifiable subgroups among those with migraine, identified by their cervical musculoskeletal function and hypersensitivity.[32] For example, the ICD-11 coding tool,[33] includes the following classifications: common migraine (without aura) 8A80.0, migraine, unspecified 8A80.Z, migraine with aura, 8A80.1Z, and vestibular migraine, AB31.1. Consequently, the findings regarding chiropractic treatment for the cervical spine for those with migraine are inconsistent, showing different neck pain types in migraine patients.

Some migraine sufferers experience neck pain as a part of their migraine symptoms without significant cervical musculoskeletal impairment, while others may have neck pain stemming from cervical issues, showing patterns similar to cervical disorders. In addition, there may be an association between low cervical disc prolapse and cervicogenic headache, with 80% of patients reporting an improvement in their headache and neck pain following surgery for cervical disc prolapse.[34] Another study looked at whether nerve root compression in the lower cervical spine could lead to headaches.[35] After a selective nerve root block, 59% of patients with headache reported a reduction of headache by 50% or more, and 60% of these patients experienced complete relief of their headache.[35] Furthermore, findings from a study suggest that referral of head pain from the upper cervical region could be an overlooked feature of migraine headache.[24]

The role of cervical musculoskeletal dysfunction in migraine is not well understood, which affects treatment decisions. For example, findings from a systematic review suggest that neck pain associated with migraine does not indicate the existence of cervical muscular dysfunction,[36] while another study that included 200 patients with migraine found a high prevalence of musculoskeletal dysfunctions.[17]

While cervical musculoskeletal interventions might benefit those with identified cervical dysfunction, further research is needed to understand patient-specific outcomes, the influence of co-existing migraine-related neck pain, and how migraine hypersensitivity might affect treatment effectiveness.

Limitations

A limitation of this case report is its lack of generalizability, as it pertains to a single patient. Although the patient's cervical spine was treated with only cervical flexion-distraction, her entire spine received treatment as needed. Consequently, the overall spine treatment might have contributed to the improvement in her migraine symptoms. In addition, the patient's improvements might have naturally occurred as part of the typical progression of her migraine headaches. However, the results of our case suggest that further research into the use of Cox® flexion-distraction as a possible treatment option for migraine headaches is warranted.

Summary

After a six-week course of care using Cox® Technic cervical spine flexion-distraction, the patient experienced an alleviation of pain, and a notable decrease in the frequency in her migraine occurrences. Furthermore, she discontinued the use of her prescribed medication. She also reported an enhancement in her activity level and functionality both at home and in her work.

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