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Case Report

Chiropractic Care of a Patient with Chronic Muscle Spasms and Headaches with Complex Comorbidity: A Case Report

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Abstract

Objective: The objective of this study is to describe chiropractic care for a woman suffering from chronic muscle spasm and headaches.

Methods: A 26-year old woman presented with a seven-year history of chronic thoracic region myospasm and frequent headaches. Clinical evaluation revealed thoracic and cervical myalgia, thoracic myospasm, and cervicogenic headaches. Health history included childhood cancer, liver cirrhosis, diabetes mellitus, and polypharmacy. Care included high-velocity low-amplitude Chiropractic Manipulative Therapy (CMT) and home-based neck exercises for 13 visits over 14 weeks.

Results: After four visits, muscle spasm and headache frequency and severity decreased by 40%. By the eighth visit, headaches further decreased, fostering resumption of previously suspended hobbies (painting and working for a local sculptor). Improved sleep, fewer allergy symptoms, and better blood glucose control were also reported.

Discussion: A variety of studies have shown that non-pharmacological conservative care in the form of chiropractic spinal manipulation is effective in the treatment of muscle spasms and headaches. The reduction in pharmacology may also contribute to improvements in a patient's ability to do activities of daily living.

Conclusion: This case presents the effectiveness of chiropractic care for this patient and suggests a need to better understand the mechanisms of CMT and exercise as they relate to chronic muscle spasm and other associated symptoms.

Keywords: Chiropractic; Spasm; Neck Pain; Cervicogenic; Headache; Cervical; Exercise; Comorbidity

Introduction

Skeletal muscle spasms are commonly due to overuse or muscle fatigue, dehydration, electrolyte imbalances, or injury [1]. Chronic muscle spasms can occur intermittently for several months or years, characterized by involuntary short-lived, sudden, violent contractions of individual muscles or muscle groups [1]. Identifying the etiology can be a complex investigation that must consider patient history, past illnesses, and current symptomatology. This article describes a patient with a complex health history including cirrhosis, which may have contributed to her chronic muscle spasms. A 2014 American Journal of Medicine article stated that 67% of patients with cirrhosis reported having chronic muscle cramps [2]. It was noted that this may be due to the 66% of these patients who were deficient in Vitamin D [2]. The main function of vitamin D is to increase calcium absorption and promote normal bone formation and mineralization [3]. Vitamin D deficiency is known to cause muscle aches, weakness, and pain resulting in muscle spasms [3]. In addition to a complex health history, this case involves polypharmacy, which is defined as taking 5 or more concurrent prescription medications. Polypharmacy increases the risk for adverse drug-drug interactions, and malnutrition [4]. This report describes the chiropractic care of a patient with

chronic muscle spasms, neck pain, headaches, multiple significant comorbidities including liver cirrhosis, polypharmacy, and a history of two prior episodes of Non-Hodgkin's Lymphoma. The polypharmacy added to the complexity of the case, which lead to a multidisciplinary approach to manage the challenges this patient faced to improve her overall health and wellbeing.

Methods

The patient was a 26-year-old female with a height of 57" and weight of 79 lbs. She was a painter, sculptor, and college student. Informed consent for this case report was provided. Her chief complaint was chronic muscle spasms along the mid back and up into the neck bilaterally. The purpose for seeking care was to engage a more conservative pain management treatment and reduce opioid use. The patient's medical history included being hospitalized for four months at age 3 years due to a chicken pox infection. Between the ages of 9-15 she had two occurrences of Non-Hodgkin's Lymphoma. Each occurrence was treated with chemotherapy drug mixtures of CHOP (cyclophosphamide, doxorubicin, and prednisone) [5] and ICE (ifosfamide, carboplatin, and etoposide) [5], total body irradiation, and Allogeneic stem cell transplant. Patient small stature was likely influenced by the radiation and chemotherapy during critical growth stages. She had a history of hypothyroid disorder that started during the first round of cancer. The cancer treatments caused mouth sores from frequent vomiting, which resulted in two gastronomy-tube placement surgeries and two bowel resection surgeries. In early adulthood, she was diagnosed with liver cirrhosis, Type II diabetes, high cholesterol, restless leg syndrome, depression and asthma. She suffered from recurrent chest and sinus infections as well as seasonal allergies. She had frequent headaches, constant back and neck pain and muscle spasms occurring approximately 5-6 times a day. She reported having severe throbbing headaches upon awakening. The symptoms were worse in the morning and at night when trying to sleep. They were aggravated by sitting or standing for extended periods of time, looking down, typing, bending, exercise, stooping and twisting. The patient reported that she had received partial relief of her symptoms after periods of no movement, previous treatments of spinal manipulation, application of heat or ice, and performing certain stretches or exercises. The patient reported no symptoms that radiated out to her extremities. The patient reported regularly taking 29 different medications including diabetes medications, fenofibrate, pramipexole, levothyroxine, desvenlafaxine, promethazine, metaxalone, dicyclomine, albuterol, esomeprazole, and diphenhydramine. Due to the patient's long list of prescription medications, drug interaction causing adverse symptoms and reactions was a concern. Medscape's drug interaction checker [6] was used to identify possible drug interactions. There were 3 severe and 7 moderate interactions ranging from chemical interactions to patient sedation which were all communicated to the patient and the patient's primary care provider, which did result in a reduction in her medications. The patient rated the intensity of her symptoms with activity as a 7/10 on the Numeric Pain Scale (NPS), with zero being complete absence of symptoms and ten being very severe or unbearable. Pain at rest was rated at 3/10. The pain was described as: sharp with certain movements, dull, deep, throbbing, cramping, aching, and stiff. The patient had not been able to enjoy her favorite activities such as painting, sculpture and LARPing (Live Action Role Playing). Active range of motion (AROM) and palpation of the patient's thoracic spine resulted in pain reported at 7/10 by the patient. Flexion of the thoracic, lumbar, and cervical spine was globally restricted and AROM resulted in the most pain for the patient, which was described as tight and achy. Isometric Range of Motion (IROM) of the thoracic spine resulted in pain with flexion, extension, and right rotation. Muscle hypertonicity was noted bilaterally in the thoracic paraspinal muscles, trapezius, latissimus dorsi, posterior shoulder muscles, and sternocleidomastoid (SCM) (Table 1). Patient reported outcome measures (PROM) used to quantitatively measure the patient's symptoms were the Neck Disability Index (NDI) developed by Vernon, H. & Mior, S. and the Oswestry Back Pain-Modified (OBP) developed by Fairbank, J. At the initial visit the NDI score was 56 and the OBP score was 46. X-ray imaging at the initial visit included a standard 3-view cervical series (anterior-posterior lower cervical, lateral, and Anterior to Posterior Open Mouth) and 2-view thoracic series (anterior-posterior and lateral). Clinical impressions were:

1. Subcortical linear radiodensities (bone within a bone) primarily involving the cervical spine, a sequela of previous radiotherapy
2. Reversed cervical curve

Table 1: The orthopedic examination revealed the following results.

Positive		Negative
• Cervical Distraction	Pain	
• Foraminal Compression	Pain bilaterally	• Adson's
• Kemp's test	Ipsilateral pain bilaterally	• Halstead
• Maximal Foraminal Compression	Pain	• Wrights
• O'Donoghue's maneuver	Pain	• Beevor's Sign
• Schepelmann's	Ipsilateral pain bilaterally	• Chest Expansion
• Shoulder Depression	Pain bilaterally	• Eden's.
• Spinal Percussion	Local pain bilaterally	

No Contraindications to Adjusting were Noted

Spinal palpation revealed areas of palpatory tenderness and tissue prominence. These findings along with the limited range of motion throughout the spine suggested segmental dysfunction related to the spine that could be addressed with Chiropractic Manipulative Therapy (CMT). Clinical impressions based on the history and exam findings included headache (R51), segmental and somatic dysfunction of thoracic region (M99.02), muscle spasm of the back (M62.803), pain in thoracic spine (M54.6), segmental and somatic dysfunction of cervical region (M99.01) and cervicalgia (M54.2) and myalgia (M79.1) of the cervical and thoracic regions. The patient's abnormal posture including anterior head carriage, a reversed cervical curve and hypertonic supporting musculature indicated an upper cross syndrome. Upper crossed syndrome is a predictable pattern of alternating tightness and weakness involving the neck and shoulders, which frequently contributes to neck and back pain [6]. Each aspect of care was oriented toward the overall goal of restoring proper muscle function, and decreasing the occurrence of muscle spasm seen in the patient. The patient expressed a preference for manual adjusting and was treated once per week for three months with CMT, specifically diversified technique. After 3 weeks, the patient was reevaluated. Other treatment consisted of stretches and exercises for her to perform at home to address the upper cross syndrome. She was instructed to stretch the cervical muscles with manual flexion and rotation stretches, and strengthen the deep neck flexor muscles with cervical retraction exercises 3-5 times a day with 3 sets of 10 each time.

Results

After the patient's first treatment visit she reported some mild soreness in the lower cervical region and on the trapezius bilaterally. She also reported having only a mild headache after waking. After the first four visits the frequency and severity of back spasms were reported by the patient to have decreased by 40%. By the eighth visit the patient resumed her hobbies without significant pain or restriction including painting and working for a local sculptor. The patient also reported improved sleep, less allergy symptoms, and better control of her blood glucose. After three months of care, the patient was scheduled on an as needed basis. She reported an improved quality of life overall. PROM scores were measured again ten weeks after care began. The NDI score decreased from 56 to 52. The OBP score increased from 46 to 48. These outcome measures were not sensitive to this case, as the patient verbally reported having a significantly improved quality of life with a decrease in severity and frequency of symptoms and satisfaction with her care.

Discussion

Care for the patient in this case was consistent with current guidelines as described in "The Treatment of Neck Pain-Associated Disorders and Whiplash-Associated Disorders: A Clinical Practice Guideline" [8]. They recommend non-pharmacological treatments including spinal manipulation and exercise when possible.8 Guideline based care also suggests multidisciplinary management for chronic and medically complex cases.8 For this patient, there was a collaborative effort with her primary care physician (PCP) to address polypharmacy issues. A study published in the European Spine Journal in 2018 that looked at applying evidence-based guidelines to treat middle-low income communities suffering from back and neck pain was referred to in the papers title as the "Global Spine Care Initiative" [9]. This study recognized the need to treat these conditions without expensive or invasive treatments [9]. Treatment options that the researchers found to be effective for acute and chronic low back and neck pain included exercise and spinal manipulation.9 To increase patient success rates clinicians were instructed to provide education and reassurance, advise patients to remain active, and provide information about self-care options [9]. While this study was focused on creating guidelines for a model of care for medically underserved areas and low- and middle-income countries, it is consistent with the previously discussed guidelines and effective for all economic classes. In a literature review titled "Kinesiological research: the use of surface electromyography for assessing the effects of spinal manipulation", the author discussed the mechanisms involved that would allow for muscle relaxation after an adjustment as well as the reasons why certain studies may refute those mechanisms.10 The populations ranged from 18-65 years old suffering from muscle spasms. The researchers focused the adjustments on hypomobile segments in the cervical, thoracic, and pelvic regions [10]. Both manually delivered manipulations and manipulations delivered via a mechanical adjusting device (such as an Activator™) were associated with changes in muscle activation [10]. The state of muscle dysfunction (e.g. palpably tender or subjectively taut) may have been a factor in achieving a myoelectric response to spinal manipulation [10]. The review noted that spinal manipulation did cause short term changes in electromyographic amplitude and muscle function [10]. It is possible that the spinal manipulation treatment of this patient contributed to reduced short term axial muscle tone changes leading to a reduction of headaches and muscle spasms. In the study, "The mechanism of back pain relief by spinal manipulation relies on decreased temporal summation of pain", the authors aimed to determine whether thoracic spinal manipulation would decrease temporal summation of back pain.11 The study comprised two controlled experiments including 16 and 15 healthy participants, respectively. Each study included six sessions during which painful or non-painful electrical stimulations were delivered in three conditions: (1) control (2) light mechanical stimulus or (3) spinal manipulation.11 The authors concluded that spinal manipulation produced specific inhibitory effects on temporal summation of back pain, consistent with the involvement of a spinal anti-nociceptive mechanism in clinical pain relief by spinal manipulation.11 The spinal manipulation of the patient

appears to have provided anti-nociceptive effects, which may have contributed to the reduction of symptoms as noted by the patient.

Other methods of conservative chiropractic care have proven effective in treating neck pain in a non-pharmacological way. In the case study, "Chiropractic treatment of postsurgical neck syndrome with mechanical force, manually assisted short-lever spinal adjustments", a 35-year-old woman with chronic neck pain for over 5 years after two separate surgeries of the cervical spine sought a chiropractic evaluation of her condition to avoid further surgical intervention.12 An Activator Adjusting Instrument (AAI) II was used and effectively treated her neck pain with resolution of all symptoms within 30 days.12 Longitudinal examination over the next 2 years showed that the patient experienced no residual effects or further recurrences of her previous chronic problem after her initial course of chiropractic care.12 The patient in our study preferred manual adjusting to mechanically assisted adjustments.

The more medications a patient takes, the higher the risk of a drug-to-drug interaction (DDI).13 The patient in this case was taking 29 medications and severe DDIs were exposed. The effects of DDIs are hard to quantify in a given patient, but they have the potential to cause additional side effects. By reducing the number of drugs that were taken to remove the DDIs, the patient may see an improvement of symptoms and/or functions. Although the DDI's did not impact the diagnosis or choice of treatment, it is possible that the actions taken to remove the severe DDIs found for this patient played a role in reduction of symptoms and the improvement of her activities of daily living.

Selecting PROM's that provide a meaningful representation of the patient's outcome is challenging.14 In this case study, the PROMs chosen did not match the improvements the patient reported. Pain and disability scores did not capture the entire patient experience. A more accurate representation of the patient's improvement in this case were the activities of daily living and the patient's ability to perform the tasks, which were important to her. Choosing the appropriate PROM's that match the patient goals is important and needs more research. The National Institute of Health's Patient Reported Outcomes Measurement Information System (PROMIS) roadmap initiative is one example of an emerging tool that merits consideration for use with future patients.14

This patient represents just one case, however, based off her demographic information and health history, the patient relates to other studies concerning back or neck spasm with a history of cancer, liver cirrhosis, diabetes, or other chronic disease. Further case reports are needed to provide additional information on patients that suffer from chronic muscle spasms that have benefited from chiropractic care.

Conclusion

This case study showed that collaborative management for a patient with chronic muscle spasms and other comorbidities was possible and was a non-pharmacological option for a patient who was dealing with polypharmacy. PROM's used in this case study were not the most valid way of discerning patient improvement. Despite the scores showing little to no improvement, the patient reported significant improvements in her activities of daily living and an overall improved quality of life.

References

1. NIH - National Cancer Institute. Pubmed Health Glossary. "Muscle Spasm" National Library of Medicine [Internet]. PubMed Health. 2018.
2. Chatrath H (2012) Prevalence and Morbidity Associated with Muscle Cramps in Patients with Cirrhosis. The American journal of medicine 125(10): 1019-1025.
3. Beers MH, Berkow R, Bogin RM, et al. The Merck Manual of Diagnosis and Therapy. Seventeenth edition. Whitehouse Station, N.J. Merck Research Laboratories, Division of Merck & Co., Inc. 1999.
4. Amangin D (2018) International Group for Reducing Inappropriate Medication Use & Polypharmacy (IGRIMUP): Position Statement and 10 Recommendations for Action. Drugs & Aging 35(7): 575-587.
5. Hertzberg M (2017) Early treatment intensification with R-ICE and 90Y-ibritumomab tiuxetan (Zevalin)-BEAM stem cell transplantation in patients with high-risk diffuse large B-cell lymphoma patients and positive interim PET after 4 cycles of R-CHOP-14. Haematologica 102(2): 356-363.
6. Drug Interaction Checker. Drug Interactions Checker-Medscape Drug Reference Database, WebMD LLC.
7. Bertelsman Tim, Brandon Steele. "Upper Crossed Syndrome." Illinois Chiropractic Society, 19 June 2019.
8. Bussières AE, Stewart G, Al-Zoubi F, et al. (2016) The Treatment of Neck Pain-Associated Disorders and Whiplash-Associated Disorders: A Clinical Practice Guideline. Journal of Manipulative and Physiological Therapeutics 39(8): 523-564.
9. Chou R, Côté P, Randhawa K, Paola Torres , Hainan Yu, et al. (2018) The Global Spine Care Initiative: Applying evidence-based guidelines on the non-invasive management of back and neck pain to low- and middle-income communities. European Spine Journal 27(6): 851-860.
10. Lehman G (2012) Kinesiological research: the use of surface electromyography for assessing the effects of spinal manipulation. Journal of Electromyography & Kinesiology 22: 692-696.
11. Randoll C, Gagnon Normandin V, Tessier J, Suzie Bois , Nabi Rustamov, et al. (2017) The mechanism of back pain relief by spinal manipulation relies on decreased temporal summation of pain. Neuroscience 349: 220-228.
12. Polkinghorn BS, et al. (2001) Chiropractic treatment of postsurgical neck syndrome with mechanical force, manually assisted short-lever spinal adjustments. Journal of Manipulative & Physiological Therapeutics 24(9): 589-595.
13. Johnell K, Klarin I (2007) The Relationship between Number of Drugs and Potential Drug-Drug Interactions in the Elderly. Drug-Safety 30(10): 911-918.
14. Chiarotto A (2016) Choosing the Right Outcome Measurement Instruments for Patients with Low Back Pain. Best Practice. Research Clinical Rheumatology. 30(6): 1003-1020.

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