CASE STUDY

Improvement in a Female with Multiple Sclerosis Undergoing Chiropractic Care Utilizing Toggle Recoil Technique: A Case Report

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ABSTRACT

Objective: To report on the reduction of symptoms associated with Multiple Sclerosis and musculoskeletal pain in a female undergoing chiropractic care utilizing Thompson Terminal Point and Toggle Recoil techniques.

Clinical Features: A 28 year old female presented with severe neck and back pain following cervical spine trauma. She had a prior diagnosis of Multiple Sclerosis. Objective indicators of vertebral subluxation were identified utilizing Thompson Terminal Point analysis and Grostic leg length analysis.

Interventions and Outcomes: Upper cervical specific Toggle Recoil technique was utilized to reduce vertebral subluxations because of the patient's sensitivity to touch. The patient reported improved sleep following the first adjustment. Improvements were noted in musculoskeletal symptoms within five visits. The patient also showed significant improvements in outcome assessment scores utilizing the Neck Disability Index, the Quadruple Visual Analog Scale, and the Headache Disability Index.

Conclusion: The improvement of symptoms associated with Multiple Sclerosis and corresponding neck and back pain following short-term upper cervical chiropractic care is presented. Along with previously published work this report intends to establish an association between the correction of upper cervical subluxation and reduction in symptoms associated with Multiple Sclerosis.

Key Words: *Multiple Sclerosis, Upper Cervical, Chiropractic, Musculoskeletal pain, adjustment, Thompson Technique, analysis, neck trauma ,vertebral subluxation*

Introduction

Multiple Sclerosis is an unpredictable chronic degenerative disease of the central nervous system (the optic nerves, brain and spinal chord).[1] It is defined clinically as distinct episodes of neurological deficit, separated in time and attributable to demyelinating white matter lesions.[1] Lesions (plaques) are sharply defined areas of gray discoloration of white matter occurring especially around the ventricles but potentially located anywhere in the CNS.[1]

Active plaques show myelin breakdown, lipid-laden macrophages, and relative axonal preservation. Lymphocytes and mononuclear cells are prominent at the edges of plaques and around venules in and around plaques.[2] The demyelination of white matter within the central nervous

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system results in a wide variety of neurological symptoms ranging from tingling, numbness, and slurred speech to visual disturbances, changes in cognition, and paralysis in severe cases.[2] In rare instances MS is so progressive that it is terminal, however most individuals diagnosed with MS have a normal or near normal life expectancy.

Approximately 400,000 Americans have MS and every hour someone is newly diagnosed.[1] Worldwide, MS affects approximately 2.1 million people.[1] Multiple Sclerosis disproportionately affects young adults and women between the ages of 20 and 50, but has been known to affect those as young as 2 and as old as 75.[1,3] It is two to three times more common in females and is more common in Caucasians of northern European ancestry than in most ethnic groups.[1] Due to the difficulty in recognizing early signs of MS, the Centers for Disease Control and Prevention (CDC) do not require doctors in the US to report cases of MS.

Forms of MS Progression

MS is categorized into four distinct forms of progression; relapsing-remitting, primary-progressive, secondary-progressive, and progressive-remitting. Relapsing-remitting MS is described as "clearly defined attacks of worsening neurological function followed by partial or complete recovery periods during which no disease progression occurs."[4] Approximately 85% of patients are diagnosed with this form at onset.[4]

Primary-progressive MS is characterized by slowly worsening neurological function from the beginning with no distinct relapses or remissions.[4] The rate of progression may vary over time, with occasional plateaus and temporary minor improvements. Approximately 10% of patients are given an initial diagnosis of primary-progressive MS.[4]

Following an initial period of relapsing-remitting MS, many people develop a secondary-progressive disease course in which the disease worsens more steadily, with or without occasional flare-ups, minor recoveries (remissions), or plateaus.[4], Approximately 50% of people with relapsing-remitting MS developed this form of the disease before disease-modifying medications became available.[4]

Progressive-remitting MS is relatively rare accounting for approximately 5% of patients.[4] These patients experience steadily worsening symptoms from the beginning, but with clear attacks of worsening neurological function along the way.[4] They may or may not experience some recovery following these relapses, but the disease continues to progress without remissions.[4]

No two individuals experience the symptoms of MS the same way nor do any two individuals show the same progression of the disease. The variation in the expression of MS raises the issue of whether it represents one or several distinct diseases. Observational data suggests that the clinical phenotype and course of MS is age dependant.[5]

The new look at the superimposition of episodes between different individuals suffering from MS while monitoring the progression of the disease is leading to a unifying concept in which primary and secondary progression might be regarded as essentially similar.[5] From clinical and statistical positions, Multiple Sclerosis might be considered as one disease with different clinical phenotypes rather than an entity encompassing several distinct diseases.[5]

Diagnosis & Treatment

Despite advances in laboratory analysis, diagnosis of Multiple Sclerosis is based on clinical findings, confirmatory paraclinical tests, imaging findings, and the exclusion of other neurological diseases.[6] Laboratory findings may however include mild lymphocytosis or increased protein count in the cerebrospinal fluid. Immunoglobulin G and oligoclonal bands are most often seen in the CSF.[7]

Specific clinical criteria for MS includes clinical abnormalities indicating at least two non-contiguous CNS white matter sites and at least two relapses into gradual progression over six months.[6] One third of MS patients experience Lhermitte's sign during their illness.[6] This may be the presenting symptom of MS in more than 15% of patients.[6] MRI is the first and only imaging modality that allows visualization of CNS lesions caused by the disease.[6]

The added use of gadolinium in MRI has allowed for the visualization and differentiation of acute inflammation and fresh plaques in areas of chronic involvement.[6] The accuracy of MRI has made it possible to virtually eliminate the use of other imaging modalities like CT and Myelography in excluding other conditions.[6]

Along with the use of pharmaceutical drugs, corticosteroids are sometimes used to speed recovery following an acute attack. Other alternative therapies for MS have included herbal and vitamin supplementation with some evidence supporting the use of Vitamin D, as well as yoga, acupuncture, and chiropractic care.[7]

Neck Pain

This case report describes successful chiropractic care of a female with Multiple Sclerosis and neck pain.

In 2000, the Neck Pain Task Force was established with four primary objectives: 1) To complete a systematic search and critical review of the scientific literature on treatment of neck pain and its associated disorders, including the epidemiology, diagnosis, prognosis, and economic costs; 2) To identify the risks associated with the treatment of neck pain and its associated disorders; 3) To complete original research using decision analysis to examine patient preferences for various treatment options; 4) To collate the above evidence, using best evidence synthesis methodology into recommendations for the control and management of neck pain and its associated disorders.[8]

Since the formation of the Neck Pain Task Force, there has been an increase in peer reviewed evidence supporting the effectiveness of chiropractic care in managing patients with neck pain due to musculoskeletal injury.

In 2006, Martinez-Segura et al.reported that a single cervical

high velocity low amplitude manipulation was more effective in reducing neck pain at rest. It was also more effective than a controlled mobilization procedure used on subjects suffering from mechanical neck pain to increase cervical range of motion.[9]

Another study followed 100 subjects monitoring the effects of chiropractic care on work related injuries resulting in neck and back pain.[10] Improvements were seen in functional scores and subjective responses, across all 3 time-based phases of patient status, acute, sub acute, and chronic.[10]

Upper Cervical Care

Some chiropractors specialize in techniques focused solely on the upper cervical area of the spine. These techniques have been shown to have a global effect on physiology with positive outcomes in patients with upper cervical subluxations. It should be noted that the objective however is not to treat the presenting symptom as much as it is to reduce the upper cervical subluxation itself for the inherent benefit therein.[11]

The positive outcomes from this type of correction have been observed in all age groups from pediatric to geriatric. Upper cervical chiropractic care has been shown to be safe in spite of complicated case presentations including those with previous spinal injury due to trauma, infection, or other abnormality.[12-22]

Case Report

History

A detailed case history was taken upon the patient's arrival at a chiropractic center. Her chief complaint was neck pain. She also had complaints of back, shoulder/arm pain (trapezius), hip/leg pain, skin problems, and easy bruising with kidney problems, which had been resolved.

The pain was the result of a traumatic fall several years ago. She slipped on a wet bathroom floor and struck her head on the toilet with her mid-back landing on the bathtub. She stated that since the fall she had constant neck pain with headaches. She described the pain as achy and burning located on the posterior neck. She reported that lying with a rolled-up towel under her neck relieved the pain and lessened the headaches. However, staying in that position for longer than 15 minutes caused her to lose consciousness for approximately 8-9 hours. When she lost consciousness, she would awake suddenly with no disorientation or memory loss.

She described the headache as a stabbing pain behind the left eye radiating into the left temporal region. This happened three to four times per week lasting five to six hours each episode. Since the fall, she also had shoulder pain accompanied by skin irritation, like acne or redness. This was on the ipsilateral side of the face that did not change with the onset of menstruation. She described the skin irritation as a "break-out" that occurred most frequently on the right.

In describing the most recent episode, she related that the neck pain had remained constant over the years not changing in quality, duration, intensity, or frequency. When asked to point to the site of the pain she pointed to the posterior cervical region (C3-C6) bilaterally. The pain was worse whenever sleeping regardless of posture, or position. She stated lack of movement makes it worse. She had found that slight active cervical motion relieved the neck pain. She described the pain at the time of the exam as "tight like a neck brace" with burning sometimes radiating pain with an intensity of 0/10 initially and 4-5/10 at the time of exam, on a 0-10 scale (0 being no pain, 10 being the worst possible pain). In response to being asked why she felt no initial pain she stated that she was "in shock" at the time of the fall. She had sought chiropractic care for this condition in the past with results described as "wonderful".

Upon review of systems, she stated that she noticed the pain more with sudden endocrine changes. This was also associated with the cardiovascular system resulting in irregular heartbeat. When asked how her neck pain affected her activities of daily living she stated that she experienced neck pain while brushing her hair. Though prescribed, she was no longer taking medication due to its ineffectiveness.

She also complained of back, hip, and leg pain. She recalled the most recent episode was two weeks prior to presentation. The onset was described as, "falling down stairs and hitting the concrete on my side," which resulted in a fractured pelvis. The pain comes and goes with changes in barometric pressure. She stated laying down improved the symptoms, while changes in weather worsened the complaint. She described the pain as a "dull ache with popping" with reduced range of motion. She described the initial intensity as 10/10, and 0/10 at the time of the exam. When asked to point to the site of the pain, she pointed to the right lateral hip area. She advised the pain is typically mild when present. She stated that the pain radiated with changes in gait down the front of her leg to the knee. Review of systems was unremarkable. She received medical intervention at the time of the injury by an MD and was fitted with a cast for approximately one month.

Her previous health history revealed facial reconstructive surgery following a motor vehicle accident at the age of five. She also had a fracture of the left arm age 15 and had various minor falls throughout her life. Family history revealed her father was deceased due to bone cancer, and her mother had been diagnosed with Multiple Sclerosis. Upon further questioning, she advised that her mother was diagnosed with relapsing-remitting Multiple Sclerosis and lives in an assisted living facility due to progression of the disease. Her own diagnosis of MS was made ten years ago by a neurologist who performed two spinal taps and an MRI. She reported having episodes of tingling and numbness, especially in the hands which have been ongoing since diagnosis. She also had changes in vision. Asked how her neck pain affected her activities of daily living she stated that she experienced neck pain while brushing her hair.

Examination

Upon examination, her vitals were as follows: Blood pressure: 111/73mm/Hg (L) 112/73mm/Hg (R), weight 185lbs, height 5'9" pulse: 66bpm left, 68bpm on right, respirations: 18 breaths per minute, and temperature: 98.6 degrees Fahrenheit. Orthopedic evaluation revealed a positive

Foraminal Compression test. She rated the pain as 7/10 and described it as sharp-shooting. She also had a positive Cervical Distraction test with pain of 7/10 described as a burning pain; and positive Shoulder Depressor test with "shocking fire" like pain from Occiput to the left shoulder (posterior upper Thoracic). The patient experienced pain in all directions of cervical motion (both active and passive), with no loss of motion or reduction in range of motion noted.

There was no pain with active or passive lumbar range of motion, and all motions were within normal limits. Straight Leg Raiser and Leseague's were positive, with pain at the L4 vertebrae and rated 7/10. The low back pain did not intensify with Foot Dorsiflexion. Fabre Patrick's test also reproduced the same low back pain rated 5/10.

Motion and static palpation revealed the following spinal fixations: posterior and left rotatory restriction at C2; a posterior and right rotatory restriction at T8, a posterior and right rotatory restriction at T12, a posterior and right rotatory restriction at L1, and a posterior and right rotatory restriction at L5. Her initial leg length in the prone position noted a discrepancy of the left leg being short by ½" with the same noted in the supine position.

Postural deviations were noted as follows: anterior head carriage and left high shoulder. Postural deviations are an important indicator of spinal misalignment.[15] She had reduced wrist extension on the left was noted with muscle strength of 4/5 measured on Oxford's scale. Sensation of C5 and C6 dermatomes were reduced on the left, and all deep tendon reflexes were absent except brachioradialis reflex bilaterally. It was rated +1 on the Wexler scale. Along with the aforementioned sensory deficit a one second delay with vibratory assessment was noted throughout, and dysmetria was present with finger-nose test.

Vertebral subluxations were present in the cervical, thoracic, and lumbar regions. The cervical subluxations were at C1 and C2 with associated myalgia, myositis, and a cervical kyphosis. The cervical kyphosis led to postural distortions. Thoracic subluxations were revealed at T8 and T12, with a left convexity less than ten degrees. Lumbar subluxations were identified at L1 and L5 along with pelvic subluxations.

Plain film radiographs were taken to rule out spinal degeneration secondary to altered biomechanics following previous trauma. The following views were ordered: Cervical (AP Open Mouth, Neutral Lateral Cervical, AP Lower Cervical and Vertex), Thoracic (AP and Lateral), Lumbar (AP, Lateral and L5 spot shot) and Pelvic (AP). Evaluation of the radiographs revealed a cervical kyphosis with the apex at C5, and a slight left convexity of the thoracic spine (T6-T10) less than ten degrees. While unremarkable for pathology the accompanying views confirmed misalignments noted on palpation.

Line drawing analysis of the cervical series revealed a C1 listing of ASLA indicating a superior misalignment of the anterior arch of atlas relative to C2 with a left lateral flexion and anterior rotatory malposition of the atlas (C1). The patient's leg length was analyzed in the supine position following the guidelines set forth by John D. Grostic.[23-25]

Intervention & Outcomes

After the first adjustment the patient rated her overall condition a 2/10 on a global pain scale (0 being the worst and 10 being best) stating "it hurt before I woke up; it woke me up". She stated that she "took Excedrin migraine and Excedrin Tension Headache with no relief." Leg check revealed a discrepancy of 1/8" (right short).

Cervical rotation had the effect of altering the leg length corresponding to her atlas listing (found on plain film analysis) confirming a Thompson Cervical Syndrome. Absence of a swollen facet joint capsule upon palpation of the cervical spine revealed no lower cervical involvement indicating a primary subluxation at atlas (C1).[26]

An adjustment was performed by hand with the patient in a right side lying position. The lateral aspect of the left atlas transverse process was contacted with the pisiform of the left hand with a line of correction congruent with the misalignment identified on film. A high-velocity low-amplitude thrust was given with the assistance of dropping headpiece in a lateral-medial, anterior-posterior, and superior-inferior direction with counterclockwise torque. Following the adjustment the patient was asked to rest on the table in a supine position for fifteen minutes. Post adjustment leg length revealed balanced legs indicating successful realignment of the patient's upper cervical spine.[27]

On the second visit, she rated her overall condition 3/10 on the global pain scale. Leg check revealed a discrepancy of 1/2" with a short left leg. When asked about her condition overall she stated "I have a really bad headache today and feel very lethargic." She went on to say she had been sleeping well and feeling "much better" within two hours following the first adjustment.

She rated her condition 5/10 overall upon arrival for her third visit. Leg check revealed a 1" discrepancy with the right leg short. She complained of a "severe headache" with associated neck pain with no other symptoms. She also described a whiplash type feeling after the last adjustment that resolved in 5-6 hours and stated that the adjustment "relieved the pressure in her head." She said she was very eager to be adjusted. The patient's cervical spine was reassessed and found to be tender to the lightest touch.

On the 4th visit, she reported an improvement in overall symptoms with a 7/10. Leg check revealed a ¼" discrepancy with the left leg short. She stated she had a very hard time sleeping the night before and that she felt some soreness following the last adjustment. She also reported constant neck pain rated 5/10.

On her 5th visit she rated her overall condition 7/10. She reported a reduction in the frequency and severity of neck pain and headaches as well as improved cervical rotation. She reported that she had insomnia for at least one week**.**

Following five total visits and five subsequent adjustments the patient reported an overall improvement in symptoms as indicated by her global pain scale. Prior to the first adjustment, she received the following outcome assessment

scores: Neck Disability Index Questionnaire (NDI) 34%, Quadruple Visual Analog Scale (QVAS) 66.7 (Headache and Neck Pain), and Headache Disability Index (HDI) 60. At a follow up interview two months after the 5th visit, she again completed the outcome assessment tools. She recorded the following scores based on her condition at the end of care: NDI 16%, QVAS (Headache 33/Neck pain 36), and HDI 16.

From the onset of care she showed an improvement in NDI score by 47%, QVAS 49%-Headache/54%-Neck Pain, and HDI scores by 27%. The HDI score reduced a total of 44 points while under short term chiropractic care; a significant improvement or (positive intervention effect) is defined as any decrease in HDI score of greater than 29 points.

Discussion

Despite advances in our understanding of the disease there is still no cure for Multiple Sclerosis.[28] The cause of the disease itself remains much a mystery; however there is a growing body of literature supporting the benefit of correcting vertebral subluxations as an effective management for those suffering with MS.[29-32]

Some theories behind the etiology of MS have suggested a genetic component causing an autoimmune response as indicated by the association of MS and HLA-DR2.[7] Still others support the hypothesis of mechanical pressure applied by torsion of the dentate ligament secondary to vertebral malpositions as a cause for musculoskeletal pain and visceral dysfunction.[23] Given the density of neuronal pathways within the cervical spine, particularly the upper cervical region, a connection may exist between the mechanical irritation of the cord by torsion of the dentate ligament and abnormal immune response.[33, 23]

The immune system dysfunction associated with MS is grounds to explore neuro-immune connections with nerve transmission and subluxations as a potential factor in the progression of the illness. There is evidence linking previous trauma to the onset and diagnosis of Multiple Sclerosis, implying a connection between stability of the cervical spine, spinal motion, and the onset of the disease.[33, 34] Elster has reported on some promising work on the effects of upper cervical specific chiropractic care and the positive outcomes of MS patients further linking the progression of the disease with the position and stability of the upper cervical spine.[29]

While traditional medical treatment of Multiple Sclerosis remains the most widely accepted, many individuals suffering with this condition seem to be turning to alternative therapies for relief and showing positive outcomes from such care.[35-39] The positive outcomes presented in these reports emphasize the importance of a multidisciplinary approach in the management of patients with Multiple Sclerosis. The neurological basis of the disease puts chiropractic care at the forefront of maintaining function, quality of life, and in some cases slowing or even reversing the signs and symptoms of the disease.[7, 29, 30]

Conclusion

The outcome shown in this case report presents the response of a single individual with MS and a history of musculoskeletal trauma to chiropractic care. The implications of this on others with a similar health history or presentation must be put into the context of variation throughout progression of the disease and symptoms resulting from cervical trauma, as well as psychosocial factors not discussed in this report.

Studies involving larger groups with MS have already been conducted showing favorable response to chiropractic care.[29] Other related chiropractic research has shown similar outcomes with patients experiencing musculoskeletal pain along with associated symptoms of MS.[29-32] In spite of this growing evidence further studies with increased sample sizes must be conducted to determine the true extent of vertebral misalignment in contributing to musculoskeletal pain and nerve dysfunction resulting either from trauma or Multiple Sclerosis.

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