Chiropractic management of a veteran with lower back pain associated with diffuse idiopathic skeletal hypertrophy and degenerative disk disease

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Received 23 December 2011; received in revised form 6 April 2012; accepted 30 May 2012

Key indexing terms:

Chiropractic;
Low back pain;
Veterans;
Hyperostosis, diffuse
idiopathic skeletal;
Geriatric;
Aged

Abstract

Objective: The purpose of this article is to report the response of chiropractic care of a geriatric veteran with degenerative disk disease and diffuse idiopathic skeletal hyperostosis.

Clinical Features: A 74-year-old man presented with low back pain (LBP) and loss of feeling in his lower extremities for 3 months. The LBP was of insidious onset with a 10/10 pain rating on the numeric pain scale (NPS) and history of degenerative disk disease and diffuse idiopathic skeletal hypertrophy. Oswestry questionnaire was 44% and health status questionnaire was 52%, which were below average for his age. The patient presented with antalgia and severe difficulty with ambulation and thus used a walker.

Intervention and Outcome: Chiropractic care included Activator Methods protocol. Two weeks into treatment, he reported no back pain; and after 4 treatments, he was able to walk with a cane instead of a walker. The NPS decreased from a 10/10 to a 0/10, and his Revised Oswestry score decreased from 44/100 to 13.3/100. His Health Status Questionnaire score increased 25 points to 77/100, bringing him from below average for his age to above average for his age. Follow-up with the patient at approximately 1 year and 9 months showed an Oswestry score of 10/100 and a Health Status Questionnaire score of 67/100, still above average for his age.

Conclusion: The findings in this case study showed that Activator-assisted spinal manipulative therapy had positive subjective and objective results for LBP and ambulation in a geriatric veteran with degenerative disk disease and diffuse idiopathic skeletal hyperostosis.

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Introduction

Low back pain (LBP) is an epidemic affecting millions of people throughout their lifetime, with 12% to 33% of people in developed countries reporting pain

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on any given day¹; and only 1 in 4 will seek treatment from a health care provider.² Once patients with lower back pain have chosen to seek care, 70% see either a primary care medical physician or a chiropractor.² Hertzman-Miller et al reports, “among low back pain patients in the United States, about one third as many go to chiropractors as to medical doctors.”³ Lower back pain is of great concern because most LBP patients are still symptomatic after 1 year and only 25% completely recover from disabilities associated with their lower back problems.⁴ In regards to functional disabilities as a result of LBP, it has been stated that about 40% of individuals with lower back pain experience difficulty walking.⁵

With such a large portion of the population experiencing LBP and high recurrence rates, as much as 60% having further episodes in the year following their initial complaint,⁶ finding an effective treatment method is essential. Research has been trying to determine what category of those with LBP will benefit most from what treatment method, but results are still inconclusive.⁷ Because education, ergonomics, and medical treatments have not reduced the incidence rate, many people are turning to complementary and alternative medicine for answers.⁶

Musculoskeletal problems are common in the military, and one study reported that as many as one-third of United States Navy and Marine Corps personnel use some form of complementary and alternative medicine.⁸ The number of veterans seen at chiropractic clinics from 2005 to 2008 was numbered at more than 13 000.⁹ After World War II, the Veterans Administration (VA) hospital system was developed to address specialized rehabilitative needs of returning troops.¹⁰ In 2004, chiropractic services were integrated into the Veterans Hospital Administration (VHA); and these are currently available at 36 VHA medical facilities or community-based outpatient clinics nationally.¹⁰ The number of veterans seen at chiropractic clinics from 2005 to 2008 was numbered at more than 13,000.⁹ The VA can also outsource patients to off-site chiropractors in what is called a *fee-basis* approach.

Schoenfeld et al¹¹ state that “Lumbar degenerative disc disease (DDD) is a progressive condition that exists along a continuum of pathologic processes.” In a study evaluating lumbar DDD from 1999 to 2008 in the United States Military, there was an incidence rate of 4.18 per 1000 person-years.¹¹ DDD is the reason for more than 90% of all adult spinal surgical procedures, being the most common condition to affect the adult spine,¹² and occurs most often at L4-L5.¹³

Diffuse idiopathic skeletal hyperostosis (DISH) is a condition occurring in approximately 12% of the US population,¹⁴ with 5% to 15% occurring in older people,¹⁵ and is characterized by massive ossification of the paraspinal and anterior longitudinal ligaments of the spine.^{14,16} Altered biomechanics of the affected area are related to DISH, which creates stiffness and decreased range of motion¹⁶ along with possible myelopathy and vertebral complications.¹⁵ Although Troyanovich and Buettner¹⁴ state that degenerative joint disease, DDD, and other inflammatory arthritides can occur simultaneously with DISH, Cammisa et al¹⁵ state that the criteria for DISH include preserved intervertebral disk height. The disease most commonly occurs in the thoracic spine and then the cervical spine and less frequently in the lumbar spine.¹⁶

The purpose of this case study is to present the findings of a geriatric veteran with lower back pain and walking dysfunction with comorbidities of DDD and DISH who received Activator-assisted spinal manipulative therapy (ASMT).

Case report

The patient provided written consent for his information to be published without personal identifiers. A 74-year-old male veteran was referred from the local VA for spinal manipulative therapy (SMT). The

Fig 1. Lateral conventional radiograph of the lumbar spine showing DISH in the thoracic and lumbar spine with DDD at L2-L3, L3-L4, and L4-L5. (Color version of figure is available online.)

patient had right side lower back pain for more than 1 week with no known trauma. The patient also reported that he had no feeling from his hips to his feet on both legs for the last 3 months. The pain had been getting progressively worse and was aggravated by walking and relieved by sitting. The patient required the use of a walker for ambulation and rated his pain as a 10/10 on a numeric pain scale (NPS) when at its worst.

The patient had a history of colon cancer with colon surgery in April of 2004. He was currently taking blood pressure medication for high blood pressure. He had a history of having pain down the legs years ago. The patient also reported that he was run over by a car on 2 occasions when he was 5 years old, resulting in an overnight hospital stay. Recent radiographs revealed DISH in the thoracic and lumbar spine with DDD at L2-L3, L3-L4, and L4-L5 and facet arthropathy at the lower lumbar spine (Figs 1 and 2).

At the time of his initial examination, the patient was coherent, alert, nervous, and moderately distressed. He was 5 ft 8.5 in tall and weighed 108 kg with a seated blood pressure of 142/68 mm Hg. On visual examination, he presented with moderate torso/lumbar flexion antalgia and was having severe difficulty even with assistance in ambulation. As self-reported outcome measures, his baseline Revised Oswestry Low Back Pain score was 44/100¹⁷ and his Health Status Questionnaire (HSQ)¹⁸ totaled 52/100.

Lumbar range of motion was 70/60 for true lumbar flexion, 12/25 for extension and left lateral flexion, and 20/25 for right lateral flexion with normal measure-

Fig 2. Spot lateral conventional radiograph clearly emphasizing idiopathic skeletal hyperostosis and DDD in the lumbosacral area.

ments based on the *AMA Guide to the Evaluation of Permanent Impairment, Fifth Edition*.¹⁹ On examination, the patient had spasm on the right from L2 to the sacropelvic and sacroiliac joint and tenderness at a 2/4 on the right at L4 and L5. Edema was present at the sacropelvic and sacroiliac joints and tenderness on the right at a 3/4 for the sacroiliac joint.

Special tests for the lumbar spine indicated that the Valsalva maneuver elicited mild lumbar pain, iliac compression test produced moderate pain at the right sacroiliac articulation, and Kemp test caused moderate pain on the right when leaning to the opposite side and moderate pain on the right leaning to the same side. Adam sign reveals structural scoliosis, Minor sign elicited severe pain in the lower back, and the patient was only able to stand with severe difficulty. The patient was unable to perform a heel or toe walk, Rhomberg test, finger to finger test, or finger to nose test.

Activator-assisted spinal manipulative therapy²⁰ was selected for treatment of this patient. This technique involves evaluating prone leg length to assess neuroarticular dysfunctions. As the patient lies prone, the practitioner uses isolation (active movements by the patient), stress (gentle force in the direction of dysfunction), and pressure tests (gentle force in the direction opposite of the dysfunction), which affect functional leg length to determine the presence of subluxations or neuroarticular dysfunctions.²¹ The high-speed/low-amplitude adjustive thrust, one per segment, is delivered by the Activator Four Adjusting Instrument (AAI).²²

Based upon the Activator Methods protocol, he presented with a pelvic deficiency (PD) of 1½ in. “Neurological chains of information isolated within a malfunctioning biomechanical unit will feed back through the nervous system, creating an error in muscular activation; this can be visualized as a change in leg length.”²¹ He was diagnosed with somatic pelvic dysfunction, osteoarthritis, DISH disease, DDD, and facet arthropathy of the lumbar spine. The clinical trial treatment plan developed for the patient included Activator protocol 2 times per week for 6 weeks to improve lumbopelvic biomechanics, relieve pain, and increase activities of daily living, followed by a progress examination. The treatment plan was subject to change based on the patient’s progress. The patient was advised to use ice at home on the lower back to reduce inflammation.

The first treatment consisted of use of an AAI in a 3-step process. The first step was using the AAI in the segmental contact point of the right spine of the ischium with a posterior, superior, and lateral line of

Table 1 Treatment and timeline for patient care

	Initial examination (tx week 0)	Progress examination (tx week 7)	Final follow-up (via mail 84 wk after progress examination)
NPS score	10/10	0/10	0/10
Leg length as per AM	1.5 in R leg PD	Legs appear even	NA
Oswestry score	44/100	13.3/100	10/100
HSQ score	52/100	77/100	67/100

drive. The second step included a segmental contact point in the sacrotuberous ligament with a posterior, superior, and lateral line of drive. The last step used a segmental contact point in the lateral aspect of the ilium with an anterior-superior line of drive.

After 4 adjustments over 3 weeks, the patient reported that he did not have lower back pain for about 1 week and was able to use a cane instead of a walker for ambulation. At this time, however, he still presented with neuromechanical evidence of somatic pelvic dysfunction and a PD of 1/2 in. Three more right posterior inferior iliac adjustments were made before the patient's legs appeared even on visual examination in the prone position.

During the fifth week, he presented with elbow pain from using the cane for support in walking; and Activator Method isolation tests indicated dysfunction in the ulna, radius, lunate, and posterior carpals. The elbow pain was resolved after 1 treatment of 4 steps including superior and medial line of drive on the anterior aspect of the ulna just distal to the olecranon, straight anterior line of drive on the posterior carpals, straight posterior line of drive on the anterior aspect of the lunate, and anterior and inferior line of drive on the posterior and proximal head of the radius.

Six weeks into treatment, he reported that his lower back felt good; and the Activator Method isolation and stress test results were negative, with the patient's legs appearing even. He was advised to come in for his progress examination at the next scheduled appointment to be thorough in ensuring that the patient continued to remain free of somatic pelvic dysfunction because of the duration of his condition and comorbidities.

At the patient's progress examination, 7 weeks into treatment, the patient reported that his lower back had not bothered lately but he does have pain with standing for more than 15 minutes. He stated that his elbow is fine but he still had numbness from the abdomen down both legs that was subsiding. The NPS decreased from a 10/10 to a 0/10, and his Revised Oswestry score decreased from 44/100 to 13.3/100. His HSQ score increased 25 points to 77/100, bringing him from below average for his age to above average for his age.¹⁸

During the progress examination, he presented with scoliosis, anterior head posture, high right shoulder, and rounded shoulders. The patient had a shuffling gait and used a cane for assistance. Lumbar range of motion was 70°/60° for true flexion, 10°/25° for extension, and 25°/25° for left and right lateral flexion. Taut fibers were found at the right lumbopelvic area only and were no longer tender, and no edema was present. Kemp test, Minor sign, foraminal compression test, shoulder depression test, Soto-Hall sign, lumbar and cervical Valsalva maneuver, Ely sign, and Rhomberg test were nonprovocative. Cervical tests were included because of earlier complaints of elbow pain. At this time, he was released from care. The patient was called a month and a half later to check his status, and he reported that he was feeling good. A phone and US mail follow-up with the patient at approximately 1 year and 9 months after his progress examination showed lasting results with an Oswestry score of 10/100 and a HSQ score of 67/100, still above average for his age¹⁸ (Table 1).

Discussion

This appears to be the first case report of ASMT for DISH disease and DDD. Only one other study could be found showing long-lasting positive improvement in reducing symptoms in a patient with LBP, DDD, and DISH disease¹⁴ but used drop table manipulations, range-of-motion exercises, extension exercise, and standing lumbar extension traction for treatment.¹⁴ Other than instructions to ice in this case, the patient's treatment included ASMT treatment only. Two other case reports of Activator Methods care of lumbar disk herniations have been published,^{23,24} and one reported sustaining results at least 1 year later.²⁴ This case is also unique because DISH disease occurs least frequently in the lumbar spine.¹⁶ Finally, because the treatment was rendered on a geriatric veteran, this case represents a patient from 2 unique population categories.

Determination of care for LBP patients continues to be an area of interest as researchers try to categorize what diagnoses will be successful with which treatment

methods.⁷ It appears that there are mixed research results for SMT, with Assendelft et al²⁵ reporting no evidence that any therapy including analgesics, exercises, physical therapy, back schools, and SMT is superior to the other. Many studies are citing statistics that reflect that LBP will resolve in about 6 weeks regardless of the treatment received, but Croft et al²⁶ showed how only 8% of patients with LBP consulted with the initial physician even though 75% continued to have complaints, which may cause a wrong assumption that the patient has recovered.

The patient in this case had comorbidities of DISH and DDD that both may have contributed to his complaints of lower back pain. Lower back pain can originate from the vertebrae, ligaments, fascias, muscles, facet joints, or intervertebral disks.²⁷ Luoma et al²⁷ studied the associations of DDD of the lumbar spine and LBP, finding that all signs of DDD were associated with an increased risk of LBP during the past 12 months. Intervertebral disks include pain-sensitive nerve endings in the fibers of the annulus fibrosus, even in a degenerated disk²⁸; and the nucleus pulposus tissue is known for marked inflammatory properties.²⁹ Complicating the ability in determining the causal relationship between DDD and pain is that degenerative disks have been found in as many as 72% of asymptomatic subjects.¹¹

For a long time, inconsistent definitions for intervertebral disk disorders have affected clinical care and hindered research; but a combined task force developed standardized definitions in 2001.³⁰ Even with this important standardization, the available research using search terms *DDD and chiropractic or intervertebral disc disease and chiropractic* was extremely limited. One study did describe several nonoperative management strategies including bed rest, medications, physical therapy, chiropractic manipulation, lumbosacral orthotic devices, selective injections, and intradiscal electrothermal therapy.³¹ More research is needed in this area because such a large portion of the population has DDD.

Some possible etiology of DISH disease includes genetics, physical injury, environment, and endocrine/metabolic insults. Another possibility is that the ligament ossification is an aberrant biologic response in attempting to establish stability.¹⁶ This could explain why Holton et al³² found that self-reported back pain was lower in older men with DISH as compared with those without DISH. Three different scholarly works concluded that DISH may be a finding without clinical relevance and not a satisfactory explanation for lower back pain.³³⁻³⁵ Of clinical

concern may be that vertebral fractures were more frequent among men with DISH compared with men with no DISH³⁶ and that it causes altered biomechanics of the area.¹⁶

Regardless of the cause or effect of DISH, or the determination of DDD causing this patient's pain, we believe that the vertebral subluxation complex (joint dysfunction and associated findings) is an important link. Improvement was seen in this case when these complexes were corrected despite his comorbidities. Several theories have been proposed to explain the reason for improvements with SMT including release of entrapped synovial folds, relaxations of hypertonic muscle by sudden stretching, and disruption of articular or periarticular adhesions.⁴ Symons et al³⁷ set out to study the reflex response of ASMT and found positive responses 83% of the time with thrusts at L2-L4 and 94% of the time in the sacroiliac spine. It has been postulated that this positive reflex response may reduce muscle hypertonicity and pain and increase the functional capacity of muscles. van Tulder et al³⁸ reviewed 25 randomized clinical trials and concluded that there was strong evidence to indicate that manipulation is more effective than placebo treatment. Fuhr describes 3 biological principles including neuromechanical, biomechanical, and mechanochemical that could describe the sustained physiological effects of chiropractic care. It is postulated that "the AAI stimulates mechanoreceptor depolarization resulting in nociceptive inhibition and reducing hyperactive musculature normalizing postural permutations."²¹ In addition, improved joint mobility is regarded to improve resorption of inflammatory tissue fluids.²⁴ As suggested by Boos et al,³⁹ it may be more beneficial to tackle the diskal inflammatory reactions instead of attempting tissue repair when dealing with DDD. Activator care results in improved articular function resulting in less joint inflammation and allowing for decreased pain and increased normal movement patterns.

There are several other reasons that this patient may have responded to ASMT including that the method is a step-by-step process in identifying and correcting specific biomechanical dysfunction. In addition, because ASMT allows for the patient to be adjusted in the prone position without any extension or rotational vectors and with a controlled monitored force, it may be a more gentle and effective approach to care for special conditions and populations. Several case studies have already been presented on positive effects of chiropractic care on elderly patients⁴⁰⁻⁴² and one with the use of AAI.⁴³

One analysis of the Western New York Medical Center showed that most of the veteran patients had undergone various forms of medical management before their request for chiropractic care,⁴⁴ which resonates with the research that LBP is a challenging epidemic. With only 1 part-time chiropractor on staff, the average wait time for a scheduled chiropractic consultation was 28 days.^{8,10} The advance clinic access was studied for its impact on timely primary care physician care within the VA,⁴⁵ but little exists about the current wait times to receive chiropractic care in the VA or how the “fee-basis” system affects this care. Because all specialty services require a referral, it may be a concern if the one in charge of referrals is unaware of how chiropractic could work for special populations that would otherwise be denied for contraindications. There does not appear to be any research in the last 5 years that addresses these concerns. Although chiropractic service has been part of the military medical system for more than 14 years in the United States, Green et al⁸ found that very little research exists.

This case shows positive response with pain reduction (as reported with NPS scores) and improved function (as reported with the Oswestry and his improved gait) and quality of life (as reported with the HSQ) with ASMT. However, several areas would benefit from future studies including long-term effects of SMT on DISH disease and DDD, and ASMT for these special conditions.

Limitations

This case study was conducted in a clinical practice setting and not a research setting, so the results in this case cannot be generalized to a larger population. In addition, bias cannot be eliminated in obtaining the outcomes because one of the authors not only collected the data but also performed the treatments. Another constraint is the lack of comparative data available specifically on VA chiropractic patients, chiropractic, and DDD and DISH disease. Furthermore, in a clinical practice setting, time constraints make it challenging to obtain full outcome measures for each visit. These measurements are done at examination times throughout the patient's care.

Conclusion

This case study showed a positive response with ASMT in a geriatric veteran patient with DISH and DDD who had severe LBP and had marked trouble with ambulation.

Funding sources and potential conflicts of interest

No funding sources were reported for this study. The first author is a member of the Activator Methods Clinic Advisory Board and an instructor with Activator Methods.

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