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The modulation of upper extremity musculoskeletal disorders for a knowledge worker with chiropractic care and applied ergonomics: a case study

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Abstract

Objective: This report describes the case management of musculoskeletal disorders for an employee in a college work environment using both chiropractic care and applied ergonomics.

Clinical Findings: A 54-year-old male office worker presented with decreased motor function in both wrists; intermittent moderate-to-severe headaches; and pain or discomfort in the neck, both shoulders, left hand and wrist, and lumbosacral region resulting from injuries sustained during recreational soccer and from excessive forces and awkward postures when interacting with his home and office computer workstations.

Intervention and Results: Ergonomic training, surveillance, retrofitted equipment with new furniture, and an emphasis on adopting healthy work-style behaviors were applied in combination with regular chiropractic care. Baseline ergonomic job task analysis identified risk factors and delineated appropriate control measures to improve the subject's interface with his office workstation. Serial reevaluations at 3-month, 1-year, and 2-year periods recorded changes to the participant's pain, discomfort, and work-style behaviors. At end of study and relative to baseline, pain scale improved from 4/10 to 2/10; general disability improved from 4 to 0; and hand grip strength (pounds) increased from 20 to 105 (left) and 45 to 100 (right). Healthy work habits and postures adopted in the 3-month to 1-year period regressed to baseline exposures for 3 of 6 risk priorities identified in the ergonomic job task analysis.

Conclusion: The patient responded positively to the intervention of chiropractic care and applied ergonomics.

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Introduction

According to Brandt et al,[1] "two thirds of employees in the industrialized countries use a computer on a daily basis and one in five interact with a computer at least 3/4 of the total work-time." This escalation in the use of technology has increased the risk exposures for knowledge workers to work-related musculoskeletal disorders (MSDs), which are also known as *repetitive motion injuries* (RMIs) or *cumulative trauma disorders*. From the US Bureau of Labor Statistics from 1982 through 1994, the injury rate of RMIs increased 1200%; and from the mid-1990s to 2000, the trend followed a 27% decline in all standard industries codes except for knowledge workers.[2] Successful risk management of RMIs can have far-reaching effects on morbidity, quality of life, and productivity in the American workplace.[3] The US Occupational Safety & Health Administration identified musculoskeletal disorders as the most prevalent, most expensive, and most preventable injuries in the American workplace today.[4]

A landmark study[5] of 22,000 workers by the National Safety Council revealed the occurrence of MSDs to be predominantly behavior based, with 88% of the injuries associated with postural deviations and poor compliance to federal and state Occupational Safety & Health Administration safety management regulations. Poor workstation design accounted for 10% of the MSDs, and 2% were of unknown etiologies. Rempel et al[6,7] demonstrated that placement of the computer monitor at a distance greater than 73 cm (28 in) with a constant font size contributed to forward head posture (FHP) with resultant visual and neck symptomatology.

Interventions combining ergonomics and chiropractic care have been sparsely reported in the literature. A case study[8] reported improvement for a participant with neck and shoulder pain subsequent to receiving diversified chiropractic care and a retrofit of the computer workstation layout and equipment. A study of a small population of bank employees (N = 25) demonstrated that implementing ergonomics interventions with chiropractic care improved the working environment and increased worker comfort and productivity and yielded a valuable return of investment.[9]

This case study is a 2-year prospective report of the long-term care of an ergonomic intervention combined with chiropractic care for the management of MSDs of an adult male worker.

Case history

This 54-year-old, right-hand–dominant, male college executive presented with a symptom complex of moderate to severe headaches, dizziness, neck and left wrist pain, low back pain, and decreased motoricity in the left hand. The participant's employment was primarily sedentary and included 12- to 14-hour days of computing with extensive use of a pointing device (computer mouse) at work and home. The participant had been an established patient of the study doctor of chiropractic (DC) for 9 years preceding the commencement of this study; and in this time, an accumulation of work stress, sedentary postures, intensive computer use, and injuries associated with his participation in weekend soccer led to a variety of musculoskeletal complaints manifesting in the neck, right hip and groin, right low back, left shoulder, left elbow, left wrist, and left hand.

He was comanaged with one or more medical doctors and specialists throughout that period. The participant had comorbidities and complicating factors, which included high blood pressure and non–insulin-dependent diabetes mellitus—both conditions being pharmaceutically managed. Spinal and extremity radiographs dating back to 1990 provided an adequate history of the integrity of his spine and joints.

Findings from radiography, ultrasonic imaging, and magnetic resonance imaging following a traumatic injury to the left hand from a fall in April 2005 identified a swollen left median nerve, a posteriorly translated left capitate with mild capitate-lunate degenerative joint disease but with no ligament tearing. Examining a second injury to his left hand in 2008 while playing soccer, radiographs revealed "no fracture with ligamentous sprain and mild joint effusion and subtle osteophyte formation." The participant sustained an initial injury in early May 2006 to his right groin and right sacroiliac (SI) joint playing indoor soccer and then reinjured the area 3 weeks after the initial injury. The first injury resolved quite rapidly with chiropractic treatment; however, subsequent to the second injury, he experienced intermittent symptoms that included localized pain to the right side of the lumbar spine and right SI joint. Magnetic resonance imaging in 2008 revealed cervical stenosis of the region C4-C7, a finding that contraindicated chiropractic manipulation at these levels. The radiologist and study DC consulted and agreed that upper cervical spinal adjustments at the C1-C2 levels should be well tolerated.