Clinical Ergonomic Job Analysis and Consultation: Facilitating Work Reentry in a Case with Upper Extremity Cumulative Trauma-Related Disability

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The management of work-related recurrent and chronic upper extremity cumulative trauma disorders (UECTDs) represents a challenge particularly when return to work is a treatment goal. Many of these work-related UECTDs may be the consequence of exposure to such physical stressors as repetition, excessive force, awkward and sustained posture in addition to psychosocial stressors in the workplace. Pain and associated disability can be exacerbated by these ergonomic and psychosocial stressors. The application of ergonomic principles and techniques in the context of clinical management of UECTDs may assist in efforts to return the injured worker to work and reduce the likelihood of increased symptoms, discomfort, and disability. This paper presents a case of a 43-year-old dental hygienist unable to work for a period of 2 months due to recurrent episodes of pain in the neck, right shoulder, and arm radiating to the right thumb experienced episodically over a 10-year duration. The case is presented to illustrate the application of ergonomic principles and techniques in the clinical management of a chronic episodic UECTD. The implementation of an ergonomic job analysis and subsequent ergonomic interventions at the workplace that occurred in conjunction with rehabilitation was associated with anecdotal improvements in pain, function, and comfort levels upon returning to work. While the case highlights the potential utility of ergonomics in the management of an occupational musculoskeletal upper extremity disorder, the need for reliable, valid, cost effective, and time efficient methods to assess ergonomic exposure within a clinical context remain to be developed.

KEY WORDS: ergonomic job analysis; upper extremity disorders; rehabilitation; cervical neuritis.

INTRODUCTION

Typically, ergonomic principles and techniques are applied as an approach to occupational safety and health directed at reducing the risk of occupational mus-

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closkeletal disorders and disability by reducing exposure to suspected risk factors. Often this approach is prompted by an increase in the incidence of work-related musculoskeletal symptoms, observed by an outside risk management consultant, government inspection (e.g., OSHA inspection) or as an overall company wide proactive prevention effort to reduce the negative health, productivity, and economic impact of musculoskeletal disorders. This ergonomic activity is carried out "in-house" or through the use of a consultant. Although this approach represents the classic use of ergonomics in health and safety, a trend in clinical practice has emerged where clinicians involved in the evaluation and rehabilitation of the injured worker with a work-related musculoskeletal disorder have begun to apply the principles and techniques of ergonomics to the assessment and management of an individual case in an effort to facilitate a safe work reentry (1).

Ergonomics is the study of human abilities and characteristics which affect the design of equipment, systems and jobs, to improve efficiency, safety and well-being (2). Proper ergonomic design can assist in producing a comfortable and safe workplace, thus contributing to worker well-being and productivity (3). Optimal ergonomic design can also minimize the risk of pain, fatigue and discomfort. Poorly designed work stations and work tasks can contribute to the initiation, exacerbation and/or maintenance of musculoskeletal pain (4). A number of workplace factors have been associated with increased risk of upper extremity cumulative trauma disorders (UECTD) (5). Keyersling, Armstrong, and Punnett (6) have identified six generic ergonomic workplace risk factors. These factors include forceful exertions, awkward work postures, localized contact stresses, whole-body or segmental vibration, temperature extremes, and repetitive motions or prolonged activities. In addition, psychosocial job stress and the influence of work organization, work pressure and perceived work environment have been identified as factors with the potential to exacerbate and/or maintain pain (7).

The use of ergonomic principles and techniques in the rehabilitation setting should assist in returning patients with occupational musculoskeletal disorders to the workplace. Developing and implementing ergonomic interventions designed to eliminate or reduce exposure to ergonomic stressors should in turn reduce the likelihood that such patients will experience pain and fatigue associated with work tasks once at work (1). The present case illustrates the use of ergonomic approaches to facilitate the return to work process in a case of episodic work-related upper extremity musculoskeletal pain.

CASE DESCRIPTION

History/Diagnosis

A 43-year-old, right-handed female with a history of neck, right shoulder and arm pain was referred by a rehabilitation nurse for a Functional Capacity Evaluation (FCE) and potential work rehabilitation program. The patient worked for 23 years as a dental hygienist. She had experienced acute episodes of neck and right shoulder and arm pain radiating into the right thumb over the past 10 years. The