TACSM Abstract

Muscle Recruitment of Upper Trapezius for Computer Workers with Chronic Neck Pain

[1]HANNAH CLINE, [1]MARQIESHA STEPHENS, [2]DAVID FLYNN, [1]SCOTT MARZILLI, [1]X. NEIL DONG

[1]Department of Health and Kinesiology; The University of Texas at Tyler; Tyler, TX
[2]East Texas Doctors of Chiropractic; Tyler, TX

Category: Undergraduate

ABSTRACT

The lifetime prevalence of chronic neck pain has been reported to be greater than 80% for office computer workers with intensive computer work. Despite the fact that prevention strategies may have reduced the incidence of chronic neck pain, they don't provide rehabilitation or prevent disease progression for computer workers who already have a symptomatic disease. By providing the means to detect tension that may otherwise go unnoticed of computer workers through the use of intervention strategies, the desire to prevent and reduce muscle tension for symptomatic computer workers can be accomplished. The central hypothesis is that changes in the motor response of symptomatic workers are manifested with abnormally higher muscle activities at rest postures and such modifications in muscle recruitment can be reversed by retraining muscles to be at a more relaxed state by attention of audio or visual biofeedback in motor learning. To test the central hypothesis, differences of muscle activation patterns between normal controls and symptomatic subjects were established by collecting EMG activity of bilateral upper trapezius muscles during a thirty-minute typing task. To meet the criteria for the symptomatic group, our subject has to have neck discomfort related to computer use which has lasted more than three months in the past year and is present in the past seven days. Muscle activities during the typing task were analyzed in terms of Amplitude Probability Distribution Function (APDF) for normalized percentages of reference voluntary contraction. By comparing average muscle activity (50% of APDF), preliminary data from this study indicated that symptomatic workers had higher muscle activities in upper trapezius muscles than asymptomatic workers. Such results may help to establish a preset threshold level of muscle activity to differentiate symptomatic and asymptomatic workers. Based on these preliminary results, a portable EMG-based biofeedback system may be developed to alleviate chronic neck pain of symptomatic computer workers by testing the latter part of our hypothesis that motor learning strategies can be used to reverse the changes in muscle recruitment of these patients.