Abstract

Effects of work/rest schedule and gender on the workload of repetitive handling of lightweight load

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The work/rest schedule during repetitive work is one of the main risk factors of musculoskeletal disorders. Many industries have repetitive tasks that carried out light weight loads.

The purpose of this study was to investigate the effects of work/rest schedule and gender on the physical workload of repetitive upper-limb tasks with handling lightweight load using EMG, perceived discomfort and maximum grip strength.

An laboratory experiment with 18 healthy participants (9 males and 9 females) were conducted to record EMG signals from 5 muscles sites of the right arm and shoulder and perceived discomfort ratings for body parts and the whole body while carrying out repetitive materials-handling tasks for 52 min. The subjects were divided into 3 groups which work/rest schedules of short, medium and long rests, respectively. ANOVAs were conducted to analyze the effects of the work/rest schedule, gender and time on RMS of EMG amplitude (Normalized RMS; NRMS), median frequency of power spectrum of EMG (Normalized MDF; NMDF) and perceived discomforts.

Statistically significant muscular fatigue effects were not found from work/rest schedules,
while there were significant increases of discomfort as the task time elapsed. However, compared with the males, the females showed a more monotonic decrease in NMDF in medium and long work/rest schedules.

It can be concluded that the working conditions adopted in this study were not enough to induce muscular fatigue, while there were significant increase in perceived discomforts. To evaluate the muscular fatigue of workload, more comprehensive variables be included in addition to the work/rest schedules.