

RESEARCH REPORT POSTER DISPLAY

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ELECTROMYOGRAPHIC ACTIVITY OF SELECTED TRUNK MUSCLES DURING BICYCLE ERGOMETER EXERCISE AND WALKING.

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PURPOSE: Recently, active treatment such as exercise has been increasingly advocated for CLBP (chronic low back pain). Specially, exercise to improve fitness has been recommended for the prevention of back injuries. The bicycle ergometer or walking has often been used to improve the fitness of patients with CLBP. However, little is known about the activity levels of the trunk muscles during such exercise. The purpose of his study was to compare the electromyographic (EMG) activities of the trunk muscles during bicycle ergometer exercises and walking and to investigate the load level on these muscles during such exercises. **RELEVANCE:** The present study provides basic information concerning fitness exercise in patients with CLBP.

PARTICIPANTS: Eleven healthy male volunteers (21.7 ± 2.5 years old) without low back pain participated in the study. **METHODS:** Bipolar surface electrodes were attached to the right side of the rectus abdominis, the obliquus externus abdominis and lower back extensor muscles (L3). EMG signals were continuously recorded while walking and during gradual loading exercises and normalized to maximal voluntary contractions (%MVC). **ANALYSIS:** One way analysis of variance (ANOVA) was performed on the %MVC from each exercise and walking for each of the three trunk muscle sites ($p < 0.05$). **RESULTS:** The rectus abdominis muscle showed activity of about 6% MVC during any grade of exercise and walking and no significant differences were found between these forms of exercise. The obliquus externus abdominis muscle showed about 30% MVC during any grade of exercise and walking, but no significant difference was found between them. The low back muscles showed activity of about 12% MVC while walking, whereas activity level increased as the exercise load using the bicycle ergometer increased. More significant low back muscles activity was observed while walking than during exercises of 25 w and 50 w. **CONCLUSIONS:** The results of this study indicated that exercise using the bicycle ergometer should be useful for maintaining or improving fitness in CLBP patients, because it results in less load on the trunk muscles and relatively more oxygen uptake than walking. **IMPLICATIONS:** For physiotherapy practice **KEYWORDS:** Trunk muscle, Bicycle ergometer, walking. **FUNDING ACKNOWLEDGEMENTS:** I acknowledge the funding sources of Kawasaki University of Medical Welfare. **CONTACT:** susumuwa@mw.kawasaki-m.ac.jp