MOTION ANALYSIS OF TRUNK WITH LUMBAR CORSET DURING WALKING IN YOUNG WOMEN

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INTRODUCTION: In the study of walking, there are many studies that have analyzed the joint angle, the joint torques and muscle activity in lower limb. However, walking is a movement from head to foot and it is important to analyze trunk movement. Lately, sports activity of handicapped people and older adults have become popular. When handicapped people and older adults exercise, they often used an athletic supporter and a lumbar corset to assist movement of the hip joint. The main effects of the corset are that it limits trunk excursion, aiding bodily movement. The aim of present study was to investigate whether the lumbar corset influences trunk motion in the sagittal plane during walking.

METHODS: Six healthy female subjects participated in this study. Subjects were given an account of experiment and signed the consent form. First of all, subjects estimated height and weight, and warmed up for 15 minutes. First, subjects walked five times in normal condition (NG). After NG was completed, subjects tried five times with lumbar corset (CG). Nine Reflective markers were attached to subjects. Walkway was 10m long, and digital video camera taping at a rate of 30 fields per second was used to track the movement of markers. The video based 2-D motion analysis system (Frame DIASⅡ Ver. 3 for Windows, DKH) was used to measure the marker displacement and angular movement on the sagittal plane. The strength to lace a corset was entrusted to each subject; the fixing point of bottom of corset was above two-finger-width from ASIS. There were the parameters using this study as below: maximum flexion angle of thoracic spine (MF), maximum extension angle of thoracic spine (ME), stride length (SL), step frequency (SF), walking speed (WS). Paired t-test was used to test for differences between conditions. Significant level was set at 5%.

RESULTS: Significant differences were not found for MF, SL, SF, WS, and was found only for ME ($p < 0.05$). The results indicated that MF and ME in CG condition were greater than NG condition in five subjects; conversely, those in NG condition was greater than CG condition in remaining one. SL slightly decreased to wear a corset; however, there wasn't significant difference between NG and CG condition. Three subjects had longer stride length in NG condition, on the other hand, three subjects had longer in CG condition. For this reason, constant tendency couldn't be seen in SL. There was no significant difference in SF; however, SL was increased in all subjects. Some subjects notably decreased WS.

CONCLUSIONS: From the results of this study, the corset made the trunk extended. On the other hand, it didn't affect stride length, step frequency, and walking speed. The present study investigated the trunk motion using two-dimensional motion analysis in the sagittal plane. However, most human movements have three-dimensional motion e. g. running, throwing, jumping, and climbing. Therefore we need three-dimensional analysis to investigate more detail of the motion and to get thorough knowledge.

REFFERENCES:

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