IMMEDIATE EFFECTS OF A RUCKSACK TYPE ORTHOSIS ON THE ELDERLY WITH DECREASED LUMBAR LORDOSIS DURING STANDING AND WALKING.

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ABSTRACT

The spinal orthosis, the so-called rucksack type orthosis (RO), has been used to relieve low back pain and fatigue during prolonged standing and walking for the elderly with spinal deformities. However, little is known about the RO’s kinematical effects. Twenty-three elderly (78.9 +/- 6.9 years old) participated in experiment 1, and 13 elderly (78.4 +/- 7.9 years old) in experiment 2. They had decreased lumbar lordosis or lumbar kyphosis. In experiment 1, using the "Spinal Mouse", which can measure spinal curvature, the effects of the RO on posture during standing were investigated. In experiment 2, using electromyography, the effects of the RO on muscle activity during standing and walking were clarified. Lumbar curvature and the trunk angle of inclination during standing improved significantly when the RO was used. Back extensor muscle activities (T9, L3, and L5) during standing and walking decreased significantly when the RO was used. There were no significant differences in the activities of the upper trapezius and vastus lateralis during standing and walking. The present study suggests that the elderly with lumbar deformities might be able to stand and walk more efficiently with the RO. The RO could prove to be valuable in preservation therapy for the elderly with decreased lumbar lordosis or lumbar kyphosis.

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