

Abstract

Study Design: Repeated Measures Design

Purpose: The purpose of this study was to investigate the influence of the distance between the position of the rotation axis of the back support and hip joint on the changes in the shear force applied to the buttocks.

Methods: The subjects were 11 healthy adult men without leg and/or trunk diseases. The shear force applied to the buttocks was measured using a force plate. This study had three experimental conditions: the position of hip joint was taken as the 3-cm forward condition, 6-cm and 9-cm to the standard sitting position.

Results: In returning to an upright position of back support, the shear force was 15.0 ± 2.9 [% body weight: %BW] in the 3-cm forward, 16.7 ± 3.6 [%BW] in the 6-cm, and 19.5 ± 5.3 [%BW] in the 9-cm. Significant differences appeared between the 9-cm and the other conditions ($p < 0.05$).

Conclusions: The results of this study suggested that the shear force applied to the buttocks changed in reclining back support and an increase in the distance between the axis of rotation

of the back support and hip joint led to an increase in the remaining shear force after reclining the back support.

196 words

Clinical Relevance

This study shows one of the strategies of seating approach for the prevention of decubitus ulcers. There is possibility of reducing shear force applied to buttocks during and after reclined back support by adjusting the axes of rotation of wheelchair back support.

42 words