



Rui Mou Xie

Tsinghua University
China

Effects of soft exoskeleton for gait training on clinical and biomechanical gait outcomes in patients with Sub-Acute stroke

Abstract:

The objective of this study was to assess the therapeutic effects of Soft-Exoskeleton (SE) assisted walking training on clinical and biomechanical gait outcomes in the rehabilitation of patients with subacute stroke.

Methods: A group patients who had experienced subacute stroke received conventional rehabilitation (CR) training combined with 10-session SE-assisted walking training (30 min/session, 5 sessions/week, 2 weeks) (SE group, n=19) compared with the control group that received CR training only (CR group, n=18). Clinical assessments and biomechanical gait measures were performed pre- and post- 10-session intervention, with the 10-Minute Walk Test (10MWT) and 6-Minute Walk Test (6MWT) used to define the primary clinical outcome measures and the Functional Ambulation Category and Fugl-Meyer Assessment for Lower Extremity (FMA-LE) subscale defined the secondary outcome measures. The gait quality outcome measures included spatiotemporal parameters, symmetry indexes, range of joint motions during walking.

Results: After the 10-session intervention, the SE and CR groups exhibited significant improvements in all clinical outcome measures ($P < 0.05$). Between-comparison using covariance analyses demonstrated that the SE group showed greater improvement in walking speed during the 10MWT ($P < 0.01$), distance walked during the 6MWT ($P < 0.05$), and FMA-LE scores ($P < 0.05$). Gait analyses showed that the SE group exhibited significantly improved spatiotemporal symmetry ($P < 0.001$) and maximum range of ankle motion ($P < 0.05$) after 10-session training, with no significant changes observed in the CR group.

Conclusions: Compared with CR training, SE-assisted walking training led to greater improvements in walking speed, endurance, and gait quality.

Biography

Rui Mou Xie has completed his Master degree (Physiotherapy) at the age of 29 years from Cardiff University, UK. He is the head of the Musculoskeletal and Gait treatment unit at the Rehabilitation Medicine Department of Beijing Tsinghua Changgung Hospital. He has published 5 papers in reputed journals and served as the principal investigator or main investigator for 5 national research projects.