



Service Priorities and Programmes
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Robotic gait training in patients with Spinal Cord Injury - a case series report

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Introduction

Walking is considered as one of the most important goal after Spinal Cord Injury (SCI). Task-specific gait training is the current rehabilitation strategy to enhance neuroplasticity by provision of appropriate gait related afferent feedback. Robot-assisted gait training (RAGT) was developed for SCI patients to provide long duration of gait training with more physiological and reproducible gait patterns and less manpower consumption. Yet there is scarcity of local studies on the efficacy of RAGT for SCI patients.

Objectives

This case series report was undertaken to investigate the feasibility of using RAGT to improve gait-related performance in people with SCI.

Methodology

Three male adults aged 53(subject1), 38(subject2), 54(subject3) years old with SCI were included in the study. American Spinal Injury Association (ASIA) Impairment Scale and neurological classification standards were used to classify the injury level. All subjects were classified as ASIA-C category with mean duration of injury 11.33 ± 0.577 months. All subjects walked with frame prior to the training. Subjects underwent 24 sessions of RAGT and each session lasted for 30 minutes. Body weight support, training speed and guidance from orthosis were adjusted according to subjects' progress. Outcome measures included walking speed as reflected by the time to complete 10-Meter Walk Test (10MWT), functional balance ability by Berg Balance Scale (BBS) and functional independence by Spinal Cord Independence Measure (SCIM). Total muscle strength over lower limbs was assessed by ASIA Lower Extremity Motor Score (LEMS).

Result

All subjects demonstrated improvement in all outcomes. Mean baseline of 10MWT,

BBS, SCIM, and ASIA LEMS were 37.13 ± 19.87 s, 26 ± 8.89 , 62.33 ± 18.50 and 31 ± 5.57 , with mean percentage improvement of 25.74%, 25.91%, 19.22% and 10.40% respectively. After training, subject 1 and 2 achieved indoor walking with quadripod and subject 2 needed slight assistance. Subject 3 was able to walk with elbow crutches. RAGT is an effective and feasible method to promote gait-related performance and functional independence in people with SCI especially on walking speed and balance. Further randomized controlled study is planned to investigate the effectiveness of RAGT for people with SCI.