



Service Priorities and Programmes

Electronic Presentations

Convention ID: 361

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Post title: Physiotherapist I, QEH, KCC

Effects of Arm Sling on Balance Control and Gait Performance in Hemiparesis Patients After Stroke: A Randomized, Crossover Study

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Keywords:

Arm sling

Hemiparesis

Stroke

Balance Control

Gait Performance

Introduction

Stroke survivors are often left with varying degrees of motor deficits which impair their ability to walk and subsequently affect the balance control. One of the ultimate goals of rehabilitation in stroke survivors is to regain the walking and balance ability in the best possible spatiotemporal gait symmetry and stability. It has been suggested that the complementary picture of the gait pattern and quality of gait control are not only rely on the motor performance of the lower extremities alone but also the alignment of the upper extremities, trunk and pelvis. Arm slings are traditional management for shoulder subluxation in patients with hemiplegia. Recent evidence suggests that arm sling may also have positive influences on balance control and gait performance in patients with hemiparesis after stroke. However, there is a lack of research done on comparing the effects of different types of arm slings on gait performance and balance control in stroke survivors.

Objectives

To investigate the effects of different types, straight or bent elbow arm slings, versus not using arm sling on (1) gait parameters including velocity, step length, stride length, cadence, percentage of duration of single limb support in gait cycle, and (2) balance control in patients presented with hemiparesis after stroke.

Methodology

It was a randomized, crossover study. Ethical approval was obtained from the research committee (KC/KE-16-0171/ER-2). Eligible stroke survivors were evaluated on 3 separate days within 2 weeks under the testing conditions of using (i) no arm sling, (ii) straight arm sling, and (iii) simple arm sling with elbow bent. The order of testing conditions was randomized. The gait parameters were evaluated using GAITRite. The balance control was measured using Berg Balance Scale (BBS) and Timed Up and Go Test (TUG).

Result

Twenty-five stroke patients (16 males and 9 females; mean age: 60.0±15.3 years) were recruited. The use of arm slings, either straight arm or elbow bent type, produced a significant greater improvement in BBS ($\chi^2=13.81$; $p=0.001$) and TUG ($\chi^2=19.85$; $p<0.001$) as compared with not using any arm sling. There was also a greater trend of improvement in walking speed in the two arm sling testing conditions but it did not reach statistical significance ($\chi^2=5.69$; $p=0.058$). Post-hoc analysis revealed no significant difference ($p>0.05$) between straight arm and elbow bent type in the aforementioned parameters. There was no statistically significant difference (all $p>0.05$) in all spatiotemporal gait parameters in the three testing conditions. The use of arm slings disregard to the type of it enhanced the balance performance and walking speed in stroke survivors presented with hemiparesis.