Title of Dissertation:

The effect of walking aids on gait symmetry and speed in hemiplegic patients

“Dissertation submitted in accordance with the requirements of University of Chester for the degree of Master of Science.”

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Declaration

“This work is original and has not been submitted previously in support of a degree qualification or other course.”

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Abstract

The purpose of this study was to investigate the effect of a stick and a quadripod on force distribution, temporal asymmetry and gait speed in sub-acute stroke patients. Thirty subjects (mean age is 64 ± 13 yr.) with first stroke who were able to walk unaided under supervision took part in this study. They walked randomly for at least fourteen meters for three walking conditions (walked unaided, with stick and with quadripod). The gait parameters, ground reaction force (GRF), temporal symmetry values and gait speed for each walking condition were measured with the Infotronic Ultraflex Gait Analysis System. The Mann-Whitney Tests, repeated measures ANOVA, Friedman test, and post-hoc test, Wilcoxon Signed Ranks Test were adopted. The results showed 74% of the subjects walked with asymmetry gait pattern which presented with prolonged swing phase and shorted stance phase in the paretic limb. Then there was no significant difference in the mean GRF in mid-stance phase between the paretic and non-paretic limbs in walking unaided (p=0.79) and walking with stick (p=0.15). However, use of quadripod significantly decreased the weight bearing on the paretic limb (670.17±156.80 vs 688.80±186.63 Newton, p=0.004) compared with unaided walking. Furthermore, walking speed was significant slower if stick (0.40±0.16m/s) or quadripod (0.39±0.14m/s) were used when compared with unaided walking.
(0.43±0.18m/s, p=0.019). Finally, walking aids was found to have no effect on all temporal symmetry values when compared with no aid (p>0.05). In conclusion, to achieve a symmetrical gait pattern in mild to moderate severe sub-acute stroke survivors under rehabilitation, walking aids, especially quadripod, was not encouraged.
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