
Hip abductor control in walking following stroke – the effect of canes, taping and TheraTogs on recovery of muscle activity

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Ms. Clare Maguire represented her research team in a poster presentation of her data on March 13, 2009 for the conference on Musculoskeletal Rehabilitation- Evidence and Competence in Bern, Switzerland. This is the abstract from that poster. A full paper has been submitted for peer-reviewed publication, has undergone 2 revisions, and is still in process.

Background: Canes are commonly used to in post-stroke rehabilitation to enable independent walking although studies have demonstrated a reduction in hip abductor activity on the hemiplegic side during walking with a cane in the unaffected hand. This reduction in muscle activity is contrary to the aims of rehabilitation.

Objective: This study aims to assess alternative treatment options which enable independent walking in stroke patients whilst simultaneously increasing muscle activity in the hemiplegic hip abductors.

Methods: A randomized, within participant, repeated measures experimental study was conducted in a movement analysis laboratory with 13 first stroke patients. Surface Electromyography (EMG) of the Gluteus Medius (GM) and Tensor Fascia Lata (TFL) muscles was collected as subjects walked for six gait cycles 1) without walking aids (baseline) and with 2) hip abductor taping 3) an elasticized hip orthosis (TheraTogs) 4) a cane. Peak EMG was calculated for each intervention and compared as a percentage change to peak EMG at baseline.

Results: Friedmans ANOVA identified significant differences for GM ($p = 0.000$) and for TFL ($p = 0.025$) between baseline and interventions. Wilcoxon Tests identified for GM significant differences between Cane-Baseline-TheraTogs ($p = 0.000$, Effect Size = -0.5), Cane-Baseline-Tape ($p = 0.001$, Effect Size = -0.46). For TFL a significant difference was identified between Cane-Baseline-TheraTogs ($p = 0.009$, Effect Size = -0.37)

Conclusions: Hip abductor taping and TheraTogs significantly increase GM and TFL activity on the hemiplegic side during walking in stroke patients compared to baseline. These interventions are more effective than canes for increasing hemiplegic hip abductor activity whilst enabling independent walking during gait rehabilitation.