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Upright Pedalling is a potential tool to provide targeted therapy for the lower limb in people greater than one year after stroke.

Hancock, NJ¹ Shepstone, L¹, Rowe, P², Pomeroy, V¹

¹Faculty of Medicine & Health Sciences, University of East Anglia, UK,

²Bioengineering Unit, University of Strathclyde

Introduction:

Our previous studies demonstrated that stroke survivors can produce smooth activity during Upright Pedalling (UP) both early and later after stroke. However, it is possible that altered patterns of movement in the unaffected lower limb might compensate for weakness in the affected limb during pedalling. Hence, this study investigated muscle activity during UP in the unaffected limb of stroke survivors compared to the lower limb of healthy older adults.

Method:

Observational study. *Participants*: n=17 adult stroke survivors (StrS), with lower limb paresis, greater than one year since stroke onset; n=10 healthy volunteers (HV), aged at least 50 years. *Instrumentation*: Upright static bike modified with light sensor to measure crank angle over time, synchronised with portable surface EMG system (*Biometrics UK*). *Procedure*: Surface EMG electrodes placed on prepared skin over right and left quadriceps and hamstrings. Participants performed UP session at comfortable cadence. *Measure*: reciprocity of muscle activity pair (quadriceps and hamstrings) established using Jaccard's coefficient. *Analysis*: reciprocity of activity between StrS and HV using independent t-tests.

Results:

There was no significant difference between reciprocal activity in the StrS unaffected limb and the HV measured limb (difference [95% CI] -0.146 [-0.379 to 0.087]; p=0.208).

Conclusion:

Reciprocal muscle activity was not significantly different between StrS unaffected limb and the HV test limb, suggesting that the unaffected limb of StrS demonstrates normal reciprocal activation during UP. Therefore, further work is indicated to establish whether UP might provide targeted therapy for the affected limb without associated compensatory activity in the unaffected limb, in later stage stroke survivors.