a better balance. The use of an implantable peroneal nerve stimulator in the drop-foot treatment of stroke survivors is encouraging. Since it does not produce pain and is easy to use, such a device is becoming more and more an essential tool in the treatment of gait disorders.

Keywords Functional electrical stimulation; Drop foot; Gait; Stroke

Disclosure of interest The authors have not supplied their declaration of conflict of interest.

Reference

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Posters

P076-e

Impaired neuromuscular function and postural control after a fatiguing exercise performed with the plantar flexor muscles

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Purpose Postural control of undisturbed standing is known to be centrally regulated. There are also evidences that postural control is impaired with muscle fatigue, i.e. a reduction in stability is usually observed after prolonged or repeated exercise. However, there is little information available about the origin of impaired postural control with muscle fatigue. The aim of the present study was to determine the extent and origin of postural control impairment after a fatiguing exercise performed with the plantar flexors (PF).

Methods Ten healthy men (26 ± 3 years) reported to the laboratory for two experimental sessions, performed on separate days in a randomized order. Both sessions consisted in a fatiguing exercise at the PF level (6 series of concentric-eccentric upright PF contractions, 30 s each, 90 s recovery). Neuromuscular fatigue (respectively postural stability) was quantified before and immediately after exercise in one session, whereas postural stability was assessed during quiet standing on a force plate at similar time points in the other experimental session. Neuromuscular alterations were assessed via techniques combining voluntary contractions, transcutaneous tibial nerve electrical stimulations and surface EMG activity recordings from soleus, gastrocnemius lateralis and gastrocnemius medialis muscles.

Results A progressive reduction in PF maximal voluntary force (MVC: $-25 \pm 18\%$, $P < 0.05$) was measured, together with a reduced maximal voluntary activation level (VAL: $-14 \pm 18\%$, $P < 0.05$). A reduction in the doublet force at 10 Hz/doublet force at 100 Hz ratio (P10/P100 ratio: $-13 \pm 6\%$, $P < 0.05$) was also observed, whereas M-wave properties were well preserved. Various indexes of postural control were altered, such as an increased stabilogram surface ($+141 \pm 136\%$, $P < 0.05$). A linear relationship was found between the extent of MVC force loss and the reduction in VAL ($r = 0.87$, $P < 0.05$), but no correlation was found between the loss in VAL and the change in postural control measurements.

Conclusion Although muscle fatigue, as reflected by PF MVC force loss, appears to be of central origin, it seems that other mechanisms, presumably peripheral, explain the alteration of posture in quiet upright stance after exercise.

Keywords Postural control; Neuromuscular fatigue; Plantar flexor

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P077-e

Ten-meter ambulation test in spastic paresis

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Introduction The function of lower limb in spastic paresis could be evaluated with ambulation test including sit-to-stand, stand-to-sit, turns and straight walk over sufficient distance. We proposed 10-meter ambulation test (AT10) from seated to seated position. The present study aimed to measure intra- and inter-reliability of the AT10 in chronic hemiparesis.

Methods Ten subjects with chronic hemiparesis (45 ± 12 years, time since stroke 16 ± 9 months, mean $\pm$ standard deviation) performed four AT10: with shoes and barefoot, at a 'natural' pace and then at 'maximal' speed on two occasions one week apart (test and re-test). The total number of steps – including during turns – and time to complete the task were clinically measured by 4 independent raters. Speed (SP), step length (SL) and cadence (CAD) were derived. Inter- and intra-rater reliability were assessed using intraclass correlation coefficient (ICC), the agreement frequency procedure, agreements being defined as a speed difference <0.05 m/s, a step length difference <0.05 m and a cadence difference <0.1 step/s.

Results For all conditions, mean intra-rater ICC were $>95\%$ (SP, $98.5 \pm 0.1\%$; SL, $98.3 \pm 0.1\%$; CAD, $96.5 \pm 0.1\%$) and agreement frequency $>68\%$ (SP, $76 \pm 8\%$; SL, $90 \pm 9\%$; CAD, $77 \pm 6\%$). Mean intra-rater difference was 0.05 ± 0.01 m/s in speed, 0.02 ± 0.01 m in step length and 0.08 ± 0.01 step/s in cadence. Mean inter-rater ICC were $>98\%$ (SP, $99.9 \pm 0.1\%$; SL, $99.7 \pm 0.2\%$; CAD, $98.9 \pm 0.5\%$) and agreement frequency $\geq 90\%$ (SP, $95 \pm 3\%$; SL, $99.6 \pm 0.8\%$; CAD, $94 \pm 4\%$). Mean intra-rater difference was 0.01 ± 0.003 m/s in speed, 0.006 ± 0.002 m in step length and 0.04 ± 0.005 step/s in cadence.

Conclusion The AT10 intra- and inter-rater reliability was excellent in chronic hemiparesis. The discrepancy between outstanding ICC and fewer raw agreements for the intra-rater measurements owed to the fact that subjects improved between the two tests.

Keywords Hemiparesis; Ambulation Test; Speed; Step length; Cadence

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