

The NESS L300Plus -Peroneal and thigh muscles functional electrical stimulation in chronic rehabilitation :a case series

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Background: Peroneal functional electrical stimulation is a common treatment for gait rehabilitation; yet, patients with hemiplegia may also suffer from thigh muscle weakness as well as their dorsiflexors inadequacy. The effect of peroneal & thigh muscles FES during the chronic stages of stroke is unknown.

Purpose: (1) to determine the feasibility of rehabilitation with Peroneal and Thigh muscles FES during chronic stroke (2) to describe the effect of this type of FES (3) to offer a clinical perspective for the use of FES during chronic rehabilitation.

Case Description: Two patients, 6 > months post stroke treated with the NESS L300Plus. Both received FES for foot drop correction, however, in one case the stimulated thigh muscles were the quadriceps and in the other the hamstrings. Each patient used the system for 6 weeks.

Outcomes: Using the Ness L300Plus, both patients immediately increased gait velocity (30.17% and 77.08% respectively). After 6 weeks, therapeutic effect was demonstrated by improved walking velocity without the system (36.43% and 102.84% respectively). To simulate daily life situations, gait speed was also measured during 10 meter walk on obstacles course. At the first week one patient was not able to complete the test at all and the second patient was able to complete the test only with the FES. After six weeks, the patient who was not able to walk over the obstacle course was able to complete the test with the system in less than two min (0.06 m/sec) the second patient improved his velocity by 20% (form 0.23 to 0.29 m/sec)

Discussion: It is possible that Peroneal and Thigh muscles delivered through a Neuroprosthesis during chronic stroke recovery may improve gait outcomes. The ability to increase gait velocity while walking over obstacles may reflect better ability to overcome difficulties at walking in a daily life environment.