SOLEUS STRETCH REFLEX INHIBITION IN THE EARLY SWING PHASE OF GAIT USING DEEP PERONEAL NERVE STIMULATION IN SPASTIC STROKE PARTICIPANTS

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has been estimated that a drop-foot is seen in about 20% of the population that suffered a stroke. Spastic hypertonia could have a significant contribution to this impaired walking ability. This study investigated a method to inhibit the stretch reflex of the Soleus muscle in the early swing phase of gait by applying an electrical conditioning stimulus to the Deep Peroneal nerve (5 pulses, 4 times motor threshold of the Tibialis Anterior muscle, 200Hz and a duty cycle of 50%).

The inhibition of the Soleus stretch reflex was investigated in 6 spastic stroke participants during treadmill walking. Conditioned and unconditioned stretches where applied in early swing with 8 deg. of dorsiflexion and varying angular velocity. The conditioning stimulus was applied with a conditioning-test delay that had previously found to be most effective. A stretch reflex-stretch velocity curve was measured with and without the conditioning stimulus to identify the character of the inhibition.

In 4 subjects a significant reduction, inhibition of more than 80%, of the stretch reflex was found at medium to high stretch velocity (ranging up to several 100 deg/s). In all participants the most effective conditioning-test delay was found to be 100 ms. The results also indicate that a decrease of sensitivity rather than an increase of reflex threshold caused the inhibition. From the result it can be concluded that Soleus stretch reflex inhibition is possible with Deep Peroneal nerve stimulation in moderately spastic participants in early swing phase of gait.