Abstract

BACKGROUND: The disorder of reflex and motor function in patients affected by stroke causes negative impact on the performance of movement patterns and affects the functional activities. OBJECTIVES: To investigate the immediate effects of transcutaneous electrical nerve stimulation (TENS) and cryotherapy interventions on the spinal reflex excitability and in the voluntary electromyography (EMG) activity in people with chronic stroke. METHOD: Randomized crossover trial. The maximum H-reflex (Hmax), the H-reflex latency and the maximum motor response (Mmax) of the soleus muscle and also the EMG of the tibialis muscle where evaluated before and after the application of TENS, cryotherapy and control conditions. RESULTS: The Hmax/Mmax ratio was statistically significant higher (p=0.0245) and the H-reflex latency was statistically significant lower (p=0.0375) in the soleus muscle of the affected limb. The EMG amplitude of the tibialis anterior was reduced in the compromised limb (p<0.0001). After the use of the TENS, a reduction in the Hmax/Mmax ratio (p=0.0006) was observed leading to lower reflex excitability. However, after the cryotherapy intervention an increase of the Hmax/Mmax ratio was observed, which was accompanied by an increase in the H-reflex latency (p=0.0001). The EMG amplitude has not changed by any of the interventions. CONCLUSIONS: Our findings suggest that TENS may be a choice for immediate reduction of reflex excitability, whereas cryotherapy intervention may increase reflex excitability in hemiparetic subjects. However, none of the changes mediated by either intervention were able to modify the electrical activity in the antagonist muscle of the spastic muscle.

Keywords

Physical therapy, transcutaneous electrical nerve stimulation, cryotherapy, EMG, muscle spasticity, H-reflex.