

Effect of Surface Spinal Stimulation (SSS) on H-reflex in Normal Individuals

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Abstract

Surface spinal stimulation is a well known technique that uses electrical currents in order to activate nerves and innervating muscles, it is one of the primary tools used to restore functions in various neurological disorders by reducing spasticity. There are many previous studies where surface spinal stimulation has been used in various neurological disorders and purposes but still there is no study to explain how surface spinal stimulation influences on monosynaptic reflex. The present study has used 2500Hz as a carrying frequency and 20 Hz as a beat frequency. Electrodes are attached 5 cm apart at the para spinal area at the T10-L2 level and electrode size (9x4.5 cm). The present study applied medium frequency currents to produce only sensory stimulation and was applied for duration of 45 minutes. H reflexes are taken pre and post spinal stimulation measure the soles muscle. The mean, standard deviation and t value for all the variables were calculated and was concluded that spinal stimulation had a significant effect on monosynaptic reflex as there was significant decrease in H/M ratio and H amplitude, however, there elongation of H latency but not up to significant levels was observed.

Key words: H-Reflex, Surface Spinal Stimulation

Introduction:

Electrical Stimulation is a technique that uses electrical currents to activate nerves innervating muscles and is primarily used to restore functions in people with disabilities. Surface Spinal Stimulation (SSS) is a form of electrical stimulation, and is used to influence the activity of nerve root fibers under the Para vertebral muscle through the surface electrodes applied over the skin of Para vertebral muscles (Wang *et al*, 2000). SSS is the process of stimulating the spinal cord with various electrical currents in order to produce stimulation and reduction in spasticity at the corresponding level of body segment. Spinal cord electrical stimulation is used in cerebral palsy and multiple sclerosis in

reducing spasticity in the majority of subjects along with improvement in bladder function, respiratory function, volitional control; active and passive movement and mood state with carry over effects lasting from 30 minutes to 24 hours (Hazelwood *et al*, 1994).

The H-reflex (Hoffmann reflex) is a reflexory reaction of muscles after electrical stimulation of sensory fibers (Ia afferents stemming from muscle spindles) in their innervating nerves (for example, those located behind the knee). The H-reflex test is performed using an electric stimulator, which gives usually a square-wave current of short duration and small amplitude (higher stimulations might involve alpha fibers, causing an F-wave, compromising the results), and an EMG set, to record the muscle response. That