Abstract

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Title: Conduction of electric potential in the organism during aplication the low frequency current - TENS

The aim of the project: Recently, the electrotherapy becomes very intensively used as a complementary method of a treatment. The effectiveness of the electrotherapy is highly dependent on an indication, therefore the knowledge of the impacts on a human body is crucial. There are many studies focusing on the local effects, but very few concerning the global effects of the electrotherapy. We want to prove the stimulating current (low frequency TENS current) elicits a physiologic response not only at the location of the application, but also in the distant tissues.

Method of evaluation: We have studied low frequency biphasic TENS current using the frequencies 10, 61, 120,189Hz and biphasic alternating TENS current using the frequencies 10, 62, 121, 190Hz. The intensity of this current was above the level of the sensitivity. For application, the certified Physis appliance from Zimmer MedizinSystem company was used. Stick-on electrodes were put on m.gastrocnemius lateralis on the left lower limb. Conduction of electric potential was measured using surface EMG with electrodes placed on m.gastrocnemius medialis on the left and right lower limb, m.biceps femoris on the left and right lower limb, m.trapezius on the left and right side. The study was performed on 10 volunteers of age 24-30 years without any known health problems. Also, the response of the non-living tissue using TENS current with the very same parameters was studied.

Results: The results of this study proved that, the conducting of the electric potential is negligible. The electric activity was found at the location of the current application and only in m.biceps femoris on the same lower limb. At the location of the current application, the applied frequency appears in its multiples. The differernces between the conduction in the vivid and non-living tissue were proved.

Key words: low frequency current, TENS, conduction of electric potential, surface electromyography