

EFFECTS OF APPLICATION OF 0,485MHZ RADIO-FREQUENCY THROUGH THE USE OF A CAPACITIVE-RESISTIVE ENERGY TRANSFER ON THE MUSCLE TISSUE "A DOUBLE-BLIND CROSSOVER STUDY"

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The aim of this study is to assess, using a Cross-Over Study design, the possible effects on muscle performance after application of a 0.485MHz radio frequency, through the use of a system to transfer capacitive-resistive energy on healthy muscle tissue. We used TECAR® (a medical device based on the physical principle of the condenser, consisting of 2 facing and separated elements by an insulating material connected to an electric power generator that produces a voltage between the 2 plates). The displacement of charges increases the microcirculation and local temperature and produces a vasodilatation. Ten trained healthy subjects (27aa +/- 2,5aa) were randomly recruited divided into 2 groups: Protocol TECAR®-ON (group A) and TECAR®-OFF Placebo (group B). Blood tests, muscle-Power-Doppler evaluation and muscle performance using an Ergo jump device (BoscoSystem) were performed. At the T0 and T1. The Protocol (TECAR® ON) consists of 25 min treatment with capacitive/resistive/capacitive mode performed bilaterally on the quadriceps muscle.

After 7 days, the subjects of Group A were treated with the protocol of the subjects in Group B and vice versa by a Cross-Over study design. All the subjects were submitted to blood analysis to check CPK, myoglobin, lactate, CBC, AST, ALT, GH, cortisol, Na, K, Cl and LDH; to evaluation of the quadriceps muscle using Power-Doppler measuring. After warming up (-CMJ, CJ 0-15s), CJ 0-5s) and muscle flexibility (Seat and Reach) were measured. All evaluations of muscle performance were performed using Ergo jump, BoscoSystem. At the end of evaluations the subjects of Group A were submitted to placebo and the subjects of Group B were submitted to protocol Tecar-on with the same procedure before the crossing. We observed a mean increase (m.i.) of CPK, Myoglobin, Lactate in both groups, but minor increase in subjects treated by the Tecar® - Protocol. CPK in Case group (m.i.= 11.875 UI/L with p=0.05) CPK in control group (i.m.= 12.63 UI/L - p= 0.05); Myoglobin in Case group (m.i.= 27.28 ng/ml w-p=0.01) Myoglobin in Control group (m.i.= 66.97 ng/ml con p=0.03) and Lactate in Case group (i.m.=2.49 mg/dl-p=0.04) Lactate in Control group (m.i. = 3.55 mg/dl-p= 0.04).

By counting of ecographvc spots was observed how the subjects submitted to protocol had a mean increase of 1mm spots (m.i. on quadriceps dx= 2.75-p= 0.002 and sn= 2.5-p=0.002), 3mm spots (m.i. on quadriceps dx=1.75-p=0.0004 and sn=1.375-p=0.0007) and >3mm spots (i.m. on quadriceps dx= 1.375-p=0.004 and sn=0.875-p=0.021). It was observed a decrease of Power (W/Kg) in the group not treated by Tecar®-Protocol (p= 0.004). The effect of application of 0.485MHz RF using this device, after muscle activity is an increase of capillary blood flow and less impact on myofibrils structures subjected to mechanical stress generated by intensive eccentric work. We could assume an effective action by the application of RF of 0.485MHz by resistive-capacitive modalities in the reduction of recovery time after repeated muscle exercises.