

스포츠재활

발표일시 및 장소 : 10 월 26 일(금) 13:45-13:55 Room B(5F)

## OP1-1-4

### **The effects of electrical muscle stimulation on trunk muscle strengthening : double blinded RCT**

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#### **Background**

Electrical Muscle Stimulation (EMS) has been introduced and globally gained increasing attention on its usefulness. Continuous application of EMS may lead to the increment of muscle mass and indirectly will increase the strength. Objective to investigate the effects of self-administered EMS on changes on trunk muscle strengthening, skeletal muscle mass and anthropometric measures. Design: double blind randomized controlled trial.

#### **Methods**

Thirty-eight adults (21 males, age : 34.7±7.0) were randomized and allocated into one of three groups. Fourteen adults (real EMS group) stimulated their abdominals, lateral trunk (left and right) and back 5 days per week (20-40 minutes per session) for 8 weeks. A Sham EMS group (N=12) were received electrical stimulation with lower power output at the minimal sensory threshold intensity. A Control group (N=12) did not receive any electrical stimulation. Their consumption of food and physical activity were continuously monitored with watch-type activity monitoring (fitbit). Subjects were tested at the pre, 4wks, and 8wks after trunk-EMS. Isometric strength of the trunk muscles was measured using the McGill's endurance test. Abdominal skeletal muscle mass, visceral and subcutaneous fat was measured with CT. Anthropometric parameter such as BMI, waist hip ratio was measured by bioelectrical impedance analysis. Laboratory data such as pulmonary function test, exercise tolerance test(VO2max) and blood test were also collected. Two-way repeated measure ANOVA was used for statistical analysis.

#### **Results**

The muscle strength of flexor was improved after 4wks (47.7%, 20.3%, 15.9%) and 8wks (67.7%, 117.2%, 83.4%) compared with that of pre-evaluation in real-EMS, Sham-EMS and control group (p<0.001). Time and group interaction is not significant. There was no difference among group at each time point. Other muscle such as extensor, left SB, right SB showed a similar pattern. There were no significant differences in skeletal muscle thickness, visceral and subcutaneous fat in trunk over the course of the study in either group. Waist hip ratio was decreased after 4weeks, and 8 weeks compared with that of

pre-evaluation in real-EMS, Sham-EMS and control group ( $p < 0.001$ ). VO2 max was increased after 8 weeks stimulation only in real-EMS group ( $p < 0.001$ )

### Conclusions

EMS as used in the current study, resulted in significant improvements in the muscular strength in the trunk and waist hip ratio. However further study will be needed to explore real-effects of EMS.

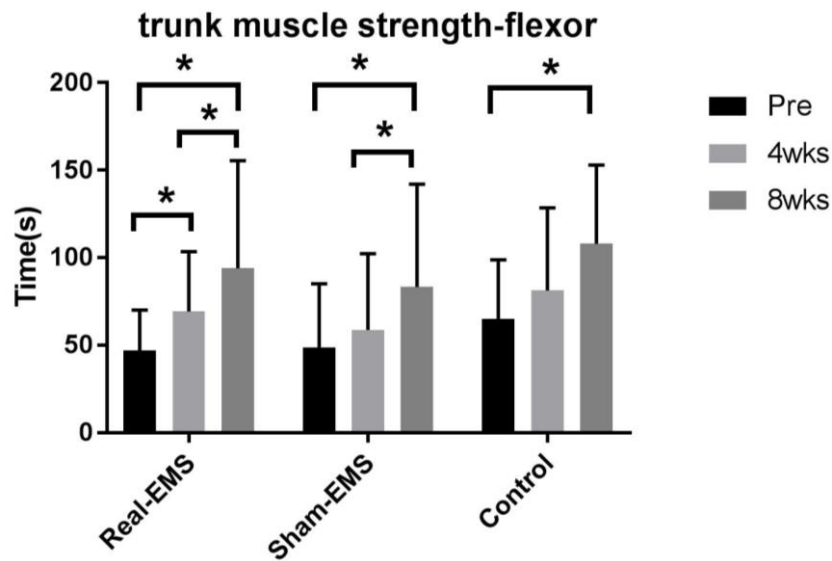


fig 1. The change of trunk muscle strength in real-EMS, sham-EMS, control group.