

The effect of whole body electrical stimulation on the resting metabolic rate , anthropometric and muscular parameters of older people. The Training and Electromyostimulation Trial (TEST)

(KEMMLER, W. / BIRLAUF, A. / VON STENGEL, S., University of Erlangen- Nuremberg 2009).

Aim of study

A substantial change in body composition, with an increase in abdominal body fat and a corresponding reduction in muscle mass, especially occurs in women after menopause. To counter this trend, whole body electromyostimulation training today stands out as an alternative to conventional muscle training featuring smaller orthopedic and cardiac loads at a comparably low training volume. The goal of this pilot study was to establish the applicability and feasibility of EMS training for older people as well as determine the effectiveness of this form of training on anthropometric, physiological and muscular parameters.

Methodology

30 post-menopausal women with long training experience were assigned randomly to a control group (CG: n=15) where they continued their training as usual, and an EMS group (n=15) , which completed a 20-minute whole body EMS training session every four days, in addition to twice weekly strength and endurance training. The most important anthropometric data (weight, size, percentage of body fat, waist circumference, etc.) were determined, along with resting metabolic rate and VO₂.

Results

The resting metabolic rate showed significant reductions in the CG (-5.3%, $p = 0.038$) and no changes (-0.2 %, $p = 0.991$) in the EMS group. Despite a medium effect size (ES: 0.62), mere tendencies without significant differences appeared between the EMS group and the CG ($p = 0.065$). The cumulative value for the skinfold thickness declined significantly in the EMS group ($p = 0.001$) by 8.6%, compared to a slight, insignificant increase in the control group (1.4%); a difference that turned out to be statistically significant ($p = .0001$, ES: 1.37). Waist circumference as a criterion for abdominal adiposity fell in the EMS group significantly ($p > 0.001$) by -2.3 % (vs. CG: +1.0 %, $p = 0.106$). The corresponding intermediate group difference turned out to be significant ($p = 0.001$, ES: 1.64).

Conclusion

In summary, improvements in functional parameters such as maximum strength and speed have been demonstrated along with health-relevant effects on body composition. In addition, a high acceptance of EMS training in this population of well-trained, post-menopausal women was established. So, aside from its effectiveness, the practicability of this type of training seems assured.