EFFECTS OF COMBINING MICROCURRENT THERAPY WITH RESISTANCE EXERCISES ON BODY COMPOSITION IN MIDDLE-AGED ADULTS: A PILOT STUDY

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INTRODUCTION

Microcurrent therapy (MT) is a non-invasive treatment that transmits subsensory currents (<1 mA) through the skin. It has been shown that combined with resistance training MT maximized training outcomes.

METHODS

This study involves a double blind randomised controlled design. Eight participants (mean ± SD: BMI 23.1 ± 3.8 kg/m2, age 54.4 ± 7.4 years, height 168.7 ± 12.3 cm) were randomly assigned to either microcurrent (MC, n = 4) or sham (SH, n = 4) groups (1 male and 3 females per group).

After completing two in-person supervised resistance training familiarisation sessions, the participants performed a 6-week home-based resistance exercise programme using resistance bands. Participants were provided with a pre-recorded copy of the session and were asked to perform 2 weekly sessions. The programme involved 8 multi-joint and single-joint exercises targeting the whole-body musculature (squat with shoulder press, biceps curl, squat, lateral pull down, deadlift, triceps extension, lunge, and upright row). Participants were required to perform 3 sets of 12-15 repetitions per exercise with 1.5 to 2 min rest between sets.

The rating of perceived exertion (RPE) was determined by the OMNI-Resistance Exercise Scale (OMNI-RES) for elastic bands (0-10 scale) to determine the increasement of the training load over the intervention period.

Fig. 1. Microcurrent device Arc4health

Participants wore a microcurrent or a sham device for 3-h post-workout and in the morning on non-training days. The microcurrent was delivered at a frequency of 1.03 kHz, at an intensity between 50 and 400 μA in a ratio of 2:1 (on:off), to induce a flow of electrons into the tissue. Measurements (body mass, BMI, waist circumference, and percent (%) body fat) were taken pre- and post-intervention. Body composition was determined using air displacement plethysmography (BodPod). Raw changes in all dependent variables were calculated by subtracting pre- from post-intervention values and compared to examine effect sizes.

Fig. 2. Seca measuring tape and BodPod system

RESULTS

Neither the MC, nor SH groups showed statistically significant differences for any of the analysed variables: body mass (mean change ± SD; MC = -0.70 ± 1.36 vs. SH = 0.48 ± 1.13 kg, $p = 0.233$, $d = 0.937$), BMI (MC = -0.20 ± 0.42 vs. SH = 0.13 ± 0.41 kg/m^2, $p = 0.313$, $d = 0.778$), waist circumference (MC = -1.45 ± 1.37 vs. SH = -1.30 ± 3.02 cm, $p = 0.931$, $d = 0.064$), and % body fat (MC = -1.90 ± 2.96 vs. SH = -0.35 ± 3.82 %, $p = 0.545$, $d = 0.453$). However, the analysis of the effects size (d) showed more favourable changes for MC compared to SH.

CONCLUSION

Adding a 3-hr microcurrent therapy post-workout provides further improvements in body composition in middle-aged adults undertaking a resistance exercise programme.