

## The influence of an adjuvant EMS training on body composition and cardiac risk factors in elderly men with metabolic syndrome

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

### Objective

Sarcopenia and (abdominal) obesity in the elderly are in close relation to mortality, multimorbidity and frailty. The aim of this investigation was to determine how far whole-body electromyostimulation (WB-EMS) training influences the body composition and cardiac risk factors in the elderly with metabolic syndrome.

### Methods

Overall 28 men with metabolic syndrome according to IDF (69.4±2.8 years) around the area of Erlangen were either randomized into a control group (CG: n = 14) or WB-EMS group (n = 14). The subjects of the WB-EMS group performed a 30 minute endurance and strength training program with EMS every 5<sup>th</sup> day over 14 weeks. In parallel the control group performed a whole-body vibration training concentrating on the enhancement of flexibility and wellbeing. As primary focus parameters the abdominal and overall body fat plus the appendicular skeletal muscle mass (ASMM) were chosen. The parameters identifying metabolic syndrome according to IDF (waist girth, glucose, triglyceride, HDL-cholesterol, systolic and diastolic blood pressure) were chosen as secondary focus parameters.

### Conclusion

The changes in abdominal fat mass with a high effect size (ES:  $d' = 1.33$ ) showed significant differences ( $p = 0.004$ ) between the WB-EMS group and the control group ( $-252 \pm 196$  g,  $p = 0.001$  vs.  $-34 \pm 103$  g,  $p = 0.330$ ). In parallel to this the overall body fat decreased by  $-1350 \pm 876$  g ( $p = 0.001$ ) in the WB-EMS group and by  $-291 \pm 850$  g ( $p = 0.307$ ) in the control group (difference:  $p = 0.008$ , ES:  $d' = 1.23$ ). The ASMM also showed significant differences ( $p = 0.024$ , ES:  $d' = 0.97$ ) between the EMS and vibration control group ( $249 \pm 444$  g,  $p = 0.066$  vs.  $-298 \pm 638$  g,  $p = 0.173$ ). Except for significant differences of the waist girth (EMS:  $-5.2 \pm 1.8$  cm,  $p = 0.001$  vs. CG:  $-3.3 \pm 2.9$  cm,  $p = 0.006$ ) in group comparison ( $p = 0.023$ , ES:  $d' = 1.10$ ) no further effects on the parameters of metabolic syndrome (see above) could be identified.

### Conclusion

A whole-body EMS training with a lower training volume (about 24 minutes/week) and a short training period (14 weeks) shows significant effects on the body composition of elderly persons. Accordingly, WB-EMS might be able to offer a promising alternative to conventional training programs for training persons with lower cardiac and orthopedic capacity.