Effect of Electrical Muscle Simulation and Resistance Exercise Intervention on Physical and Brain Function in Middle-Aged and Older Women N.Thapa, J.Yang, S.Bae, G.Kim, H.Park, H.Park

There are many "standard" characteristics of ageing, but there are a handful that can potentially be more detrimental than others, one of which is a loss of skeletal muscle (mass). Sarcopenia is defined by "progressive and generalized loss of skeletal muscle mass, strength, stem cells, and physical function". This results in decreased quality of life, increased risk of injury and disease, and can eventually lead to death. While sarcopenia can easily be staved off with weight bearing exercise/resistance training and appropriate protein intake, sarcopenia is present in 5-13% of individuals over 60, and 11-50% of people 80 and over.

This study looked at how effective electrical muscle stimulation (EMS) + resistance training is on both physical function and brain function in middle aged and older women. 48 women aged 40-85 years, were broken into 3 groups: EMS + RT, RT, and control (the control group did no physical activity, rather they attended seminars on prevention of geriatric disease, 1x/wk for 4 wks). Both experimental groups participated in 50 minutes of work, 3x/wk for 4 wks, doing exercises such as straight leg raises and ankle pumps; the EMS group did the same exercises while undergoing stimulation. Physical function was further assessed using skeletal muscle mass index, handgrip strength, gait speed, five times sit-to-stand and timed up-and-go tests and brain function was assessed by EEG.

The study showed some improvement in strength in both the EMS + RT and the RT only groups. *Significant* increases in skeletal muscle mass index, phase angle, gait speed, muscle strength, lower limb mobility as well as brain connectivity and function were seen in subjects of the EMS + RT group, *not* in those of the RT only group. We can conclude from these findings that EMS benefits the body and the brain of middle aged and older women, and therefore may be a great exercise option for the older population to ward off common dangerous "side effects" of the natural ageing process.