

Influence of different electromyostimulation systems of the geniohyoid muscle in patients with obstructive sleep apnea

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The electrostimulation (EMS) is an innovative procedure for therapy in obstructive sleep apnea syndrome (OSAS). It was of interest whether different EMS methods and electrodes had influence on the to be stimulated muscles.

Two different EMS systems were used for stimulation of OSAS patient over a time period of 4 weeks 2 times daily. In group I 15 patients (mean age 52,2 years) with OSAS were treated by the ApnoeStim[®] apparatus (Bio-Medical Research Company). The group II (n = 10 patient, mean age 53,1 years) with OSAS the Snorprevent[®] apparatus (Stimpont Company) was applied. Both systems use an intraoral and extraoral electrode and similar stimulation parameters (Group I: impulse width 200 μ s, Group II: 300 μ s). The main difference is based on two different intraoral electrodes: in group I a non-individually adapted silicon electrode and in group II an individually adapted gold electrode was applied. All patients were registered previously and after 4 weeks by 3D-ultrasound and the volumetric measurement of the geniohyoid muscle was carried out.

There were no significant differences between the age and the RDI in both groups. All patients suffered from a light or moderate OSAS (RDI < 20). The Snorprevent[®] system appeared to be more comfortable in application for the patient than the ApnoeStim[®] system. For adaption of the intraoral electrodes by Snorprevent[®] a casting of the mouth floor was necessary. The sonographical measurements of the geniohyoid muscle confirmed the influence of the training system: after 4 weeks stimulation an increase of volume could be proved on average in group I of 8.3 % (range 4 to 12 %). The group II showed a significantly (ANOVA type: p < 0,05) higher strengthening of the muscle with an increase of the muscle volume in mean of 21,1 % (range 9,5 – 27,6 %).

The optimal fit of the mouth floor electrode and the stimulation parameter are of great importance for the effectivity and comfort of the EMS in therapy of obstructive sleep apnea.

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