

Obstructive sleep apnea syndrome: Results of therapy by electromyostimulation

Arwed Ludwig¹, Oliver Monzavifar², W. Jordan³

¹ Department of Cranio-Maxillofacial Surgery, University of Goettingen, Robert-Koch-Str. 40, D-37075 Goettingen

² Dental Surgery, Ellernstr. 41a, D-30175 Hannover

³ Department of Psychiatry und Psychotherapy, University of Göttingen, von Siebold-Str. 5, D-37075 Goettingen

The electrostimulation (EMS) of the mouth floor muscles is an innovative procedure for therapy in obstructive sleep induced apnea syndrome (OSAS). So far there are only few scientific findings about the influence on sleep parameters and morphology of mouth floor muscles.

In 17 male patients with OSAS over a time period of 4 weeks 2 times daily the enoral-cutaneous EMS was applied by the apparatus BMR PolyStim 262 (Bio-Medical Research Company). All patients were initially standardized as well as 4 weeks after evaluation in sleeping laboratory. They were registered on two following days by polysomnography and previously divided into 3 groups according to the RDI: group 1 with light OSAS (RDI < 10), group 2 with moderate OSAS (RDI 10 - 20) and group 3 with strong OSAS (RDI 21 to 40 and higher). Additionally, the volumetric 3D-sonographical measurement of the M. geniohyoideus was carried out by B-Scan-sonography in combination with a 3D-workstation (ViewPoint Company).

The patients' age ranged from 37 - 66 years (mean 52.2 years). 24 % had mild, 65 % a moderate and 11 % severe OSAS. After 4 weeks stimulation a 34 % reduction of the RDI in all groups (group 1: RDI 34 %, group 2: 32 %, group 3: 46 %) could be proved with a responder ratio of 76%. No improvement (non-responder) of the sleep parameters were only registered in group 1 and 2. The sonographical measurements of the M. geniohyoideus confirmed the influence of the muscle training. Moreover, after 4 weeks stimulation an increase of volume could be proved in average of 7 %, 8 % and 8.3 % (group 1 – 3). In cases of a high initial volume (>12 ml) of the muscles less training effects could be registered - that is a lower increase of muscle volume - than in initially smaller muscles. 6 months after stimulation therapy an increase of the muscle volumes (mean 39%) could be found.

The EMS enables an effective, physiologically, noninvasive therapy of OSAS. This therapy should continuously be applied otherwise a relapse of the muscles is to be expected. According to the initial values of the sleep parameters, an absolute improvement of the parameters of over 30% can be expected. It has to be decided whether in strong cases of OSAS such reduction is sufficient or whether additional treatment should follow.

Int J Oral Maxillofac Surg 32, Suppl. 1, S24 (2003)