

## **How long does electromyostimulation therapy have to be applied in obstructive sleep apnea?**

**Ludwig A<sup>1</sup>**

<sup>1</sup> Department of Cranio-Maxillofacial Surgery, University of Goettingen, Germany

**Objectives:** Muscle stimulation techniques have became alternatives for therapy of OSAS. In this study it was of interest for how long the electromyostimulation therapy has to be applied by the patient.

**Material and methods:** In two groups of OSAS patients an individually shaped mouth floor electrode (IME) had been used for electromyostimulation therapy. The enoral-cutaneous EMS was carried out with the low frequency stimulation apparatus I-pulse two times daily for thirty minutes during daytime hours, only. For achievement of an efficient recruitment of the muscles, patients were instructed to choose treatment with maximum intensity. In group I only over a period of eight weeks the EMS was applied and than stopped. In group II the patients used EMS therapy for half a year continuously. Before stimulation and 4, 8, 12 and 26 weeks after starting stimulation 3D-volumetric sonographical measurement of the geniohyoid muscle was carried out by B-scan sonography in combination with a 3D-workstation.

**Results:** All patients (n = 12, average age 50.1 years) totally applied the EMS-therapy. After four weeks EMS-therapy a volume increase in both groups was registered: in group I in median of 19.0 % (minimum 9.2 %, maximum 27.6 %) and after eight weeks of 27.0 %; group II: 19.6 % and 28.2 % (8 weeks). Additionally also in both groups a shortening (contraction) of the muscle in length of 4.7 % / 4.9 % in median was measurable. In group I after the end of the stimulation period a decrease of the muscle volume developed in all cases. After 26 weeks the volume was next to the baseline before stimulation (+ 4.3 %). In the second group, the increase of volume persisted (+ 29.4 %) over the observation period of 12 to 26 weeks. No decrease could be found. Despite the weakness of the muscle in the first group snoring and apnea occur only in 50 % of the patients.

**Conclusions:** The EMS-therapy with optimized individually adaptable electrodes should be carried out as continuous long term therapy or as interval therapy. As the results show, a pause of stimulation for 4 weeks is possible. After that period stimulation has to be carried out again for maintenance of therapy effect.

**Proceedings of the American Thoracic Society, Volume 2, Abstracts issue, A613 (2005), Abstracts ATS 2005, San Diego**