

## Tongue Muscle Training by Intraoral Electrical Stimulation in Obstructive Sleep Apnea. A Double-Blind, Placebo-Controlled Study

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**Introduction and rationale:** Although continuous positive airway pressure has proved effective in the treatment of sleep apnea, compliance is not as good as might be expected. Thus, several alternative therapy options have been studied. However, few data are available on the efficacy of electrical neurostimulation of the upper airways muscles as an alternative therapy option. We therefore investigated, in a placebo-controlled, double-blind study, the efficacy of tongue muscle training by electrical stimulation. **Methods:** 57 patients (85% of all participants, 32 stimulation, 25 placebo) with mild to moderate obstructive sleep apnoea syndrome (AHI 10-40/h) completed the study. They practiced tongue muscle training by electrical stimulation during the daytime for at least 20 minutes twice a day for eight weeks. **Results:** There was no significant change in the apnea/hypopnea index or the sleep profile either under placebo or stimulation. However, snoring improved significantly under stimulation (baseline  $63.6 \pm 23.1$  epochs/h, stimulation  $47.5 \pm 31.2$ ,  $p < 0.05$ ) but not under placebo. In the subgroup of treated patients with a baseline apnea/hypopnea index  $< 25/h$  there were 6 (out of 19) patients (none under placebo,  $p < 0.01$ ) whose apnea/hypopnea index decreased to less than 10/h (baseline  $18.4 \pm 3.9/h$ , treatment  $6.4 \pm 2.7/h$ ,  $p < 0.05$ ). Moreover, a significant improvement in snoring by  $58.7 \pm 29.8\%$  and in the number of arousals was found in the responder subgroup. **Conclusions:** Although tongue muscle training cannot generally be recommended the method has proven effective in snoring and in terms of the AHI in 31.6% of the patients with mild sleep apnea.

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