

Effects of Combined Maxillo-Mandibular Oral Appliance Therapy in Adults with Severe OSA

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Introduction: Mandibular repositioning devices (MRD) have long been deployed for the management of mild to moderate OSA, but there is less evidence on their efficacy in severe cases that have failed to comply with CPAP therapy. Biomimetic oral appliance therapy (BOAT) differs from conventional MRD therapy as it aims to correct the nasal airway through midfacial redevelopment in combination with mandibular repositioning, which aims to improve the oropharyngeal airway in adults. In this preliminary investigation, we tested the hypothesis that severe OSA can be addressed using combined maxillomandibular BOAT in adults.

Methods: In this pilot study, we included 7 consecutive adults aged > 21 yrs that had been diagnosed with severe OSA, following an overnight home sleep study that had been interpreted by a Medical physician. Each subject that participated in this study had failed to comply with CPAP therapy and was treated under medical supervision by a dentist with advanced training in dental sleep medicine. At each monthly follow-up visit, examination for progress and adjustments of the devices were performed to optimize their efficacy. The mean apnea hypopnea index (AHI), respiratory disturbance index (RDI) and oxygen desaturation index (ODI) of the study sample was calculated prior to and after BOAT. The findings were subjected to statistical analysis, using paired t-tests.

Results: Prior to treatment the mean AHI of the study subjects was 45.2 ± 8 ; the mean RDI was 47.4 ± 8 , and the ODI was 33.6 ± 9 . A further follow home sleep study was done after approximately 9 mos. At this time, the AHI decreased significantly ($P < 0.001$) to a mean value of 19.5 ± 6 after BOAT, which represents a fall in the mean AHI of 57% for the study sample. The mean RDI fell to 23.7 ± 7.7 ($P < 0.001$), and the ODI was improved to 11.2 ± 1.9 ($P < 0.001$).

Conclusion: This pilot study suggests that combined maxillomandibular oral appliance therapy may be a useful method of managing severe cases of OSA in adults, and might represent an alternative to CPAP and MRD therapy. However, long-term follow up using a larger sample size is needed to reach more definitive conclusions on these preliminary findings.