

Selecting OSA patients for oral appliance therapy by mandibular protrusive titration: effect of hypopnea scoring criteria on predictive accuracy.

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Introduction

We have developed a mandibular protrusion titration test (MATRx™, Zephyr Sleep Technologies), carried out during polysomnographically monitored sleep, to select candidates for oral appliance therapy. A patient is prospectively predicted to be a favorable candidate if mandibular protrusion reduces the AHI during REM while supine to 12 hr^{-1} or less. The present investigation examined the effect of two different hypopnea criteria on predictive accuracy.

Methods

OSA patients ($n=58$) underwent the test and received a mandibular protruder (SomnoDent®, SomnoMed) set at a target position determined from the study. RDI was measured by a portable monitor (Snoresat™, Sagatech) at baseline and while wearing the appliance. Therapeutic success was considered to be an $\text{RDI} \leq 10 \text{ hr}^{-1}$ with the appliance. Both PSG interpreter and dentist were appropriately blinded. Patients who were therapeutic failures at target received additional mandibular protrusion and were retested. The PSG was scored using two secondary criteria for hypopnea: 1) a desaturation $\geq 4\%$ (rule 4a), or 2) a desaturation $\geq 3\%$ or an arousal (rule 4b).

Results

Values for 4a target, 4b target, 4a final, and 4b final, respectively, are as follows: Sensitivity: 0.78*, 0.66, 0.75*, 0.62; Specificity: 0.90*, 0.95*, 1.00*, 1.00*; Pos. Pred. Value: 0.93*, 0.96*, 1.00*, 1.00*; Neg. Pred. Value: 0.70, 0.59, 0.63, 0.50 (*= $P < .05$).

These values indicate that with either hypopnea scoring rule, the test predicts therapeutic success with high accuracy. However, the negative predictive power is lower, particularly in mild OSA and when rule 4b is used. Addition of a prediction rule to the 4a criteria that liberalizes prediction of therapeutic success in mild patients by including REM lateral, significantly improved the accuracy of negative predictions without compromising positive predictive accuracy (Sensitivity: 0.83*; Specificity: 1.00*; Pos. Pred. Value: 1.00*; Neg. Pred. Value: 0.71).

Conclusion

Our results indicate that the mandibular protrusion titration test has adequate predictive accuracy to select patients for oral appliance therapy.

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