

Impact of Upper Airway Stimulation Treatment for Obstructive Sleep Apnea on Comorbid Insomnia, Depression and Sleepiness Patient Reported Outcome Measures

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Objective: Evaluate the impact and responsiveness of Upper Airway Stimulation (UAS) on measures of insomnia and depression in obstructive sleep apnea (OSA).

Background: UAS for OSA improves patient reported outcomes (PROs) in sleepiness and functional outcomes, but its effect on insomnia and depression are unknown.

Design/Methods: Polysomnographic data and PRO data from OSA patients with UAS from November 2015 to September 2018 was analyzed, including the apnea hypopnea index (AHI), arousal index, oxygen saturation (O₂) nadir, Epworth Sleepiness Scale (ESS), Functional Outcomes Sleep Questionnaire (FOSQ), Insomnia Severity Index (ISI) and Patient Health Questionnaire-9 (PHQ9). The changes from pre- to post-UAS for AHI, O₂ nadir, arousal index and 1-month and 12-month PROs were calculated and Wilcoxon signed rank test was used to assess if changes were statistically significant. Spearman correlation was used to assess the association of change in AHI and change in PROs.

Results: Baseline characteristics of 69 patients were: age 63.7±9.3 years, 68.1% male, mean body mass index (BMI) 28.4±3.4 kg/m², median pre-ISI 17.0[12.0-21.0], median pre-PHQ9 7.0[4.0,14.0], median pre-AHI 38.2[30.8,48.6], median pre-arousal index 33.2[26.6,47.7] and median pre-O₂ nadir 83.0[77.0,87.0]. The change in AHI (-34.8[-44.7,-26.7]), arousal index, (-10.9[-21.3,1.6]), and 1-month change and 12-month change in ESS (-4.0[-5.0,0.00], -2.0[-4.5,-0.50]), ISI (-4.0[-8.0,-1.00],-6.0[-9.0,-2.0]), and PHQ9 (-3.5[-5.0,0.00], -3.5[-7.0,0.00]) all had a statistically significant reduction after UAS, while the change in O₂ nadir (4.5[0.00,7.0]) and 1-month change and 12-month change in FOSQ (1.5[0.00,3.0], 2.0[-1.00,5.0]), increased (p<0.05 for all). Although ESS, ISI, FOSQ and PHQ9 at 1 month had a statistically significant change after UAS, none had statistically significant correlation with change in AHI.

Conclusions: In this primarily older, overweight male sample, not only did we identify improved sleepiness and functional outcomes in response to UAS for OSA, but for the first time, we show improvement in insomnia and depression to levels which meet clinically meaningful improvement, and of lasting benefit.