

Abstract

Objectives: The objective is to determine the prevalence and predictors of comorbid insomnia in patients presenting for sleep surgery evaluation. The insomnia severity index (ISI) was utilized to evaluate patients on their insomnia severity.

Methods: Study design was a retrospective chart review. A focused review of patients' medical charts presenting to an otolaryngology sleep surgery clinic who then completed a sleep history questionnaire was completed. Patients were divided and compared between those with and without clinically significant insomnia.

Results: 119 total patients were included in the study: 50 (42%) with an ISI \geq 15 and 69 (58%) with an ISI $<$ 15. Clinically significant insomnia was associated with RDI ($p=0.028$), frequency of wake ups ($p=0.008$), time to fall back asleep ($p=0.049$), history of CPAP device use ($p=0.012$), Epworth Sleepiness Scale ($p=0.016$), and SNOT-22 ($p<0.001$).

Conclusion: Patients reporting to a sleep-surgery clinic are at an elevated risk for comorbid insomnia. The relationship between increased RERAs and non-sleep SNOT-22 scores to related sleep-maintenance insomnia supports the connection between insomnia, nasal obstruction, and CPAP intolerance.

Introduction

- Chronic insomnia lasting greater than 3 months is prevalent in approximately 9% of the population¹
- The insomnia severity index (ISI) is a 7-item questionnaire that has been validated as a screening tool, for evaluation of clinical treatment treatment, and research^{2,3}
- Obstructive sleep apnea (OSA) is commonly treated by a sleep surgeon in patients that cannot tolerate continuous positive airway pressure (CPAP) therapy
- Insomnia is prevalent among patients with sleep-disordered breathing (SDB) and may confound treatment and influence treatment recommendations⁴

Methods

- A retrospective chart review of patient demographics, past medical history, most recent sleep study, and sleep history questionnaire data were collected from all new patients presenting to the otolaryngology clinic for sleep surgery evaluation between January 2020 and September 2020
- A sleep history questionnaire was completed at the first office visit, which included the ISI, Epworth Sleepiness Scale (ESS), and Sino-nasal Outcome Test (SNOT-22)
- Patients with moderate to severe clinical insomnia (ISI \geq 15) were compared to patients with clinically insignificant or subthreshold insomnia (ISI $<$ 15). An unpaired t-test analyzed continuous variables between the two groups, and a Pearson Chi-Square test was performed for categorical variables

Results

- 119 patients were analyzed, with 50 (42%) included in the insomnia group (ISI \geq 15) and 69 (58%) in the control group (ISI $<$ 15)
- No statistical significance was noted in any of the demographic variables between the insomnia and control groups

	ISI $<$ 15 [mean \pm SD]	ISI \geq 15 [mean \pm SD]	P
AHI/REI	30.3 \pm 25.1	38.7 \pm 27.0	0.085
RDI	27.8 \pm 25.0	50.9 \pm 28.2	0.028
O ₂ Nadir	80.8 \pm 8.1	77.2 \pm 14.3	0.083

Table I. Comparison of Case and Control Sleep Study Characteristics

	ISI $<$ 15 [mean \pm SD]	ISI \geq 15 [mean \pm SD]	P
Hours in bed [mean \pm SD]	7.5 \pm 1.2	7.8 \pm 1.8	0.277
Time to fall asleep in minutes [mean \pm SD]	20.4 \pm 17.3	23.5 \pm 19.3	0.362
Frequency of wake up [mean \pm SD]	2.4 \pm 1.7	3.5 \pm 2.4	0.008
Time to fall back asleep in minutes [mean \pm SD]	10.9 \pm 16.6	18.7 \pm 21.4	0.049
Shift work	11 (16%)	12 (24%)	0.271
Tried CPAP device	53 (77%)	47 (94%)	0.012
Full face mask	35 (51%)	34 (68%)	0.059
Nasal mask	18 (26%)	19 (38%)	0.166
Nasal pillow	19 (28%)	16 (32%)	0.598
Tried BiPAP device	8 (12%)	7 (14%)	0.696
Tried oral appliance	10 (15%)	9 (18%)	0.606
Epworth Sleepiness Scale [mean \pm SD]	9.2 \pm 6.3	11.9 \pm 5.7	0.016
SNOT-22 [mean \pm SD]	21.8 \pm 14.1	41.5 \pm 17.9	<0.001
SNOT-22 sleep portion [mean \pm SD]	9.1 \pm 6.2	17.5 \pm 5.6	<0.001
SNOT-22 non-sleep portion [mean \pm SD]	13.0 \pm 9.8	24.1 \pm 15.1	<0.001

Table II. Comparison of Case and Control Sleep Questionnaire Variables

Discussion

- Patients with OSA have clinically significant insomnia at a higher rate than the population prevalence of insomnia alone, and treatment of OSA with CPAP can be especially problematic with comorbid insomnia⁴
- There was a significantly higher RDI in patients with insomnia who underwent a sleep study, but there was not in AHI nor REI. Respiratory-event-related-arousals (RERAs), a sequence of breaths lasting \geq 10 seconds with increased respiratory effort or flattened inspiratory portion of the flow signal leading to sleep arousal, account for the difference between these indices⁵
- Increased RERAs, increased non-sleep SNOT-22 scores, and an increase in reported sleep-maintenance insomnia on the patient questionnaire strengthen the association between nasal obstruction, insomnia, and CPAP intolerance

Conclusion

- Patients presenting to a sleep-surgery clinic are at high risk for comorbid insomnia
- Sleep surgery should be undertaken with caution in patients with clinically moderate-to-severe insomnia
- The treating surgeon can maximize patient benefit by diagnosing and treating comorbid insomnia in addition to OSA

References

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