Insomnia in OSA Patients Treated with Hypoglossal Nerve Stimulation

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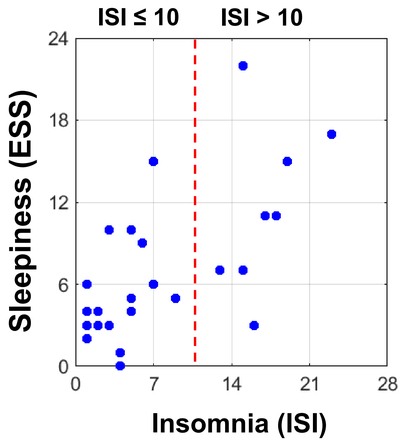
Introduction

- Hypoglossal nerve stimulation (HGNS) is increasingly used to treat obstructive sleep apnea (OSA), usually for patients who cannot tolerate using positive airway pressure (PAP) therapy.
- In our clinical practice, some patients cannot tolerate HGNS, and state that the repetitive tongue protrusion disrupts their sleep. As HGNS is invasive, expensive and resource-consuming, it is very important if tolerance to HGNS can be predicted before surgery.
- Many patients have both insomnia and OSA (COMISA = Co-Morbid Insomnia and Sleep Apnea). Some patients meet the clinical criteria for insomnia both before and after initiation of HGNS therapy. Only a few papers have addressed whether insomnia impacts the usage and the efficacy of HGNS. Data are often limited, and results often differ from each other.
- Here we report preliminary data from a small cohort at a single academic center. Our objective is to compare to published, larger cohorts, and explore the factors that may confound the relationships between insomnia and HGNS therapy.

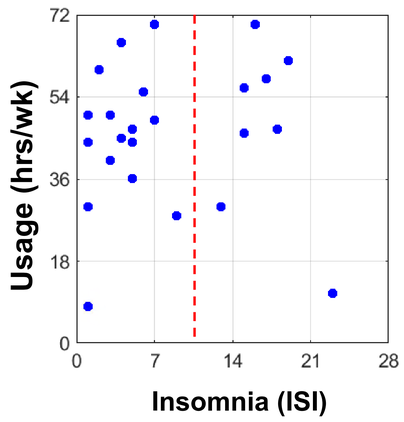
Methods

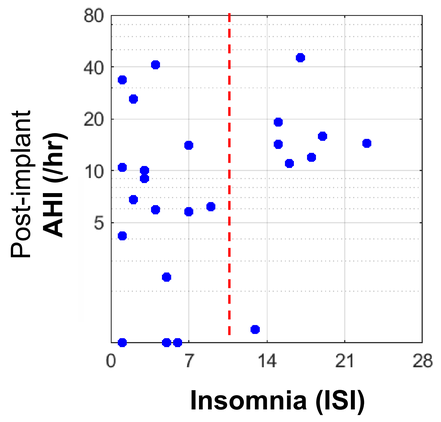
- For patients in our clinic who have received the standard right-sided HGNS (brand name: Inspire), we conducted both chart review and phone-based patient interviews.
- Chart review of sleep studies provided the values of pre-implant diagnostic apnea-hypopnea index (AHI), and post-implant therapeutic AHI (at or near the minimum therapeutic voltage) and sleep efficiency derived from the post-implant fine-tuning polysomnography. Review of clinic visits provided the value of therapy usage (hours per week).
- We scheduled phone interviews of the patients and obtained the Insomnia Severity Index (ISI, value range: 0-28), the Epworth Sleepiness Score (ESS, value range: 0-24), and other parameters such as the patient's satisfaction with HGNS, using the same questionnaire as used in the ADHERE registry.
- By conventions, ISI value above 10 was considered suggestive of clinical insomnia.
- By conventions, HGNS therapy was considered fully effective if the post-implant therapeutic AHI was less than 15 /hour and less than 25% of the pre-implant diagnostic AHI.

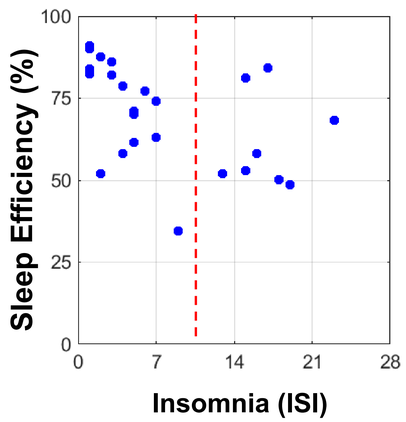
Results

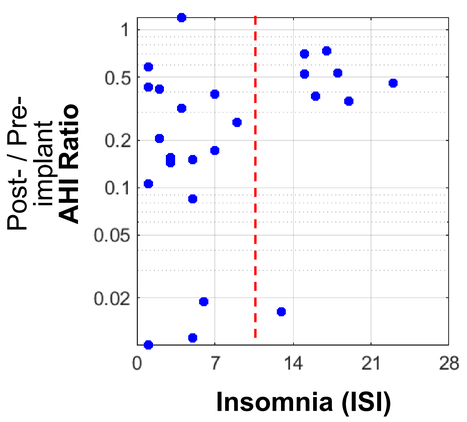


- We obtained complete data from 25 patients, among which 8 patients (32%) had ISI > 10.
- Among patients with ISI > 10, HGNS was fully effective in only 1 patient (12%). In contrast, among patients with ISI ≤ 10, HGNS was fully effective in 10 patients (59%).









Discussion

- We found a strong correlation between insomnia severity (ISI) and daytime sleepiness severity (ESS) in post-implant HGNS patients. This is *contradictory* to [1] in which ISI and ESS were uncorrelated. One possible explanation may be that ESS and ISI values were collected during the same visit in our study, but during different visits in [1].
- We found no significant correlation between ISI and usage of HGNS, or between ISI and sleep efficiency in post-implant PSG. This is consistent with [1], but contradictory to [2] and [3]. Insomnia is associated with lower usage of PAP therapy, and some studies argued for a similar case for HGNS therapy. [3]
- Most interestingly, we found a possible association of insomnia with lower therapeutic efficacy of HGNS therapy, as measured by several different metrics (conventions, post-implant AHI, post-/pre- AHI ratio).

Summary

- Our data showed similarities to and differences from prior studies on the topic of insomnia and HGNS therapy.
- One confounding factor may be when the ISS value is obtained (at the same time as or different from other metrics).
- Another confounding factor may be the proportion of patients with both insomnia and excessive daytime sleepiness, which is one of several distinct phenotypes of insomnia.
- With the caveat that our current cohort size is small, future studies of multi-center, larger cohorts are much needed.

References

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