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Lessons Learned From Inspire Super-Performers

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Background

Upper airway stimulation (UAS) is a FDA-approved implantable neurostimulation system, (Inspire Medical Systems, Minneapolis, MN, USA) to treat selected CPAP-intolerant OSA by stimulating the distal branches of the hypoglossal nerve. The stimulation leads to selective activation of the genioglossus muscle, resulting in airway enlargement at the level of the palate and tongue base [1-8]. The Stimulation Treatment for Apnea Reduction (STAR) trial followed these first implanted patients for 60 months, showing sustained improvement in apnea-hypopnea index (AHI) and QoL measures [2] The ADHERE (Adherence and Outcome of Upper Airway Stimulation for OSA) international registry demonstrated similar improvements in outcomes, in addition to significantly higher therapy adherence and patient satisfaction when compared to historical CPAP averages [9]. Such studies have supported the use of UAS as a viable and effective treatment alternative to TSS for patients failing CPAP therapy. This study aims to examine what demographic factors correlate most with UAS adherence and efficacy.

Methods

We queried a single surgeon's database of UAS cases, totaling 97 at the time of study. The electronic medical record (EMR) was queried for each patient and pertinent demographics were recorded. We began by defining cohorts: super-adherers were those with greater than 6 hours of nightly device use; non-adherers less than 4. Super-responders had a post-operative AHI and ESS less than 10, and greater than 80% decrease in AHI. Non-responders had an AHI greater than 20 and less than 50% decrease. Super-performers met both super-adherer and responder criteria, while non-performers similarly met both negative criteria.
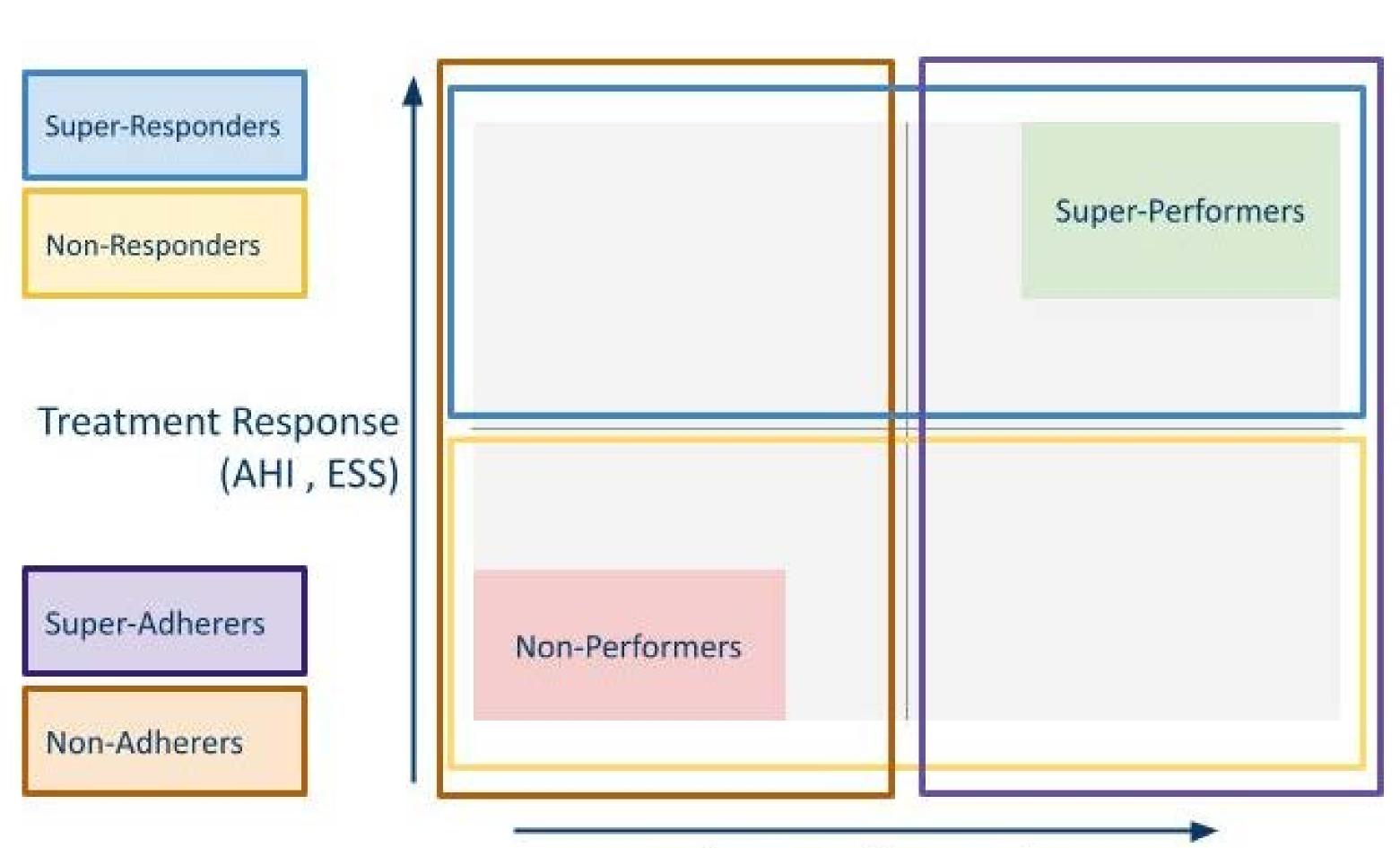
Results

Overall, 97 patients underwent hypoglossal nerve stimulation with an average AHI reduction of 67.1%, and 6.2 hours of nightly adherence. 11 patients were defined as super-performers, and 3 as non-performers. 20 patients were super responders vs 11 non-responders. 49 were super adherers vs 34 non-adherers. P-values for various categories are displayed in Table 1, no difference was found between the groups as age, BMI, sex, pre-op AHI, and pre-op VOTE score when examined.

Conclusions

Upper airway stimulation is an effective treatment for patients intolerant of CPAP. In this review there were no statistically significant differences found between the best and lowest performing patients in terms of baseline characteristics.

Group	n	Age	BMI	Pre-Op AHI	Sex	V	O	T	E
Super-Performers	11	67.7	29.9	34.4	6M:5F (54.5%)	1.6	1.3	1.4	0.6
Non-Performers	3	70.3	28.0	43.2	2M:1F (66.6%)	2.0	1	0.7	1.3
p-value	n/a	0.23	0.47	0.46	0.71	0.29	0.57	0.13	0.25
Super-Responders	20	63.2	29.3	36.5	11M:9F (55%)	1.7	1.4	1.3	0.7
Non-Responders	11	69.6	29.5	43.7	9M:2F (81.8%)	1.8	1.0	0.9	0.8
p-value	n/a	0.09	0.92	0.18	0.14	0.41	0.17	0.14	0.61
Super-Adherers	49	61.7	29.7	34.1	29M:20F (59.2%)	1.6	1.0	1.1	0.6
Non-Adherers	34	59.8	28.9	37.0	27M:7F (59.2%)	1.6	1.2	1.1	0.9
p-value	n/a	0.52	0.27	0.39	0.05	0.85	0.39	0.99	0.16

Super-Responders
Non-Responders
Super-Adherers
Non-Adherers
Super-Performers
Non-Performers
Treatment Response (AHI , ESS)
Adherence (hrs used)

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Disclosures: None