Title: Sonu Nasal Congestion Relief Study in Patients Suffering From Moderate to Severe Nasal Congestion (SCORE)

NCT Number: NCT05821842

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Sponsor: Sound Health Systems

1. STUDY PROTOCOL

1.1 Objectives
This study was designed to demonstrate the safety and effectiveness of the Sonu System for the treatment of patients with moderate to severe nasal congestion.

1.2 Study Design
This is a multi-center, randomized, double blind study of approximately 50 subjects suffering from moderate to severe nasal congestion. Three sites will participate in enrollment. Those who meet the inclusion/exclusion criteria will be invited to participate in the study.

After signing an Informed Consent Form and providing Demographic Information, Medical History, Allergy History, and Medications, the subject will receive the Sonu Device (device and smartphone [if needed] and the app). Subjects will complete the Total Nasal Symptom Score (TNSS) questionnaire, Visual Analog Scale (VAS) for Headache or Facial Pain, SNOT-22 and PROMIS Sleep Disturbance Questionnaire within the App.

Subjects will be randomized to either receive treatment for two weeks, or sham therapy for two weeks. Interventional treatment arm consists of using Sonu Acoustic Resonance Therapy (ART) for 15 minutes, twice a day. Sham consists of using non-resonant acoustic energy (2 kHz, 2 seconds duration tone every 10 seconds at 50% of therapeutic volume) for 15 minutes, twice a day.

Treatment (or sham) will be completed twice daily, during a morning window from 5am to 12pm and during an evening window from 5pm to 12am. Treatments will automatically stop at 15 minutes. Subjects will complete the TNSS questionnaire and the VAS-HA/FP immediately after the second treatment each day. After the second treatment on the 7th and 14th days subjects will also complete the SNOT-22 and PROMIS questionnaire.

The Total Nasal Symptom Score (TNSS; possible score of 0-12) is a validated patient-reported outcome measure for nasal quality of life research. The TNSS is the sum of 4 symptom subdomains for rhinorrhea, nasal congestion, nasal itching, and sneezing, each self-rated by the subject using a scale of 0=None, 1=Mild, 2=Moderate, or 3=Severe. Subjects will complete the TNSS reflecting on the previous 24 hours at baseline and after the second treatment (treatment or sham), every day over the 2 week period.

The Visual Analog Scale for Headache and/or Facial Pain (VAS-HA/FP) is a measure comprised of a line where patients mark the severity of any headache or facial pain they experience, measured in a range from 0 - 100. Subjects will complete the VAS-HA/FP at baseline and after the second treatment (treatment or sham), every day over the 2 week period.

The SNOT-22 is a validated patient-reported outcome measure for quality-of-life research, comprised of 22 questions with possible answers ranging from 0 - 5. The SNOT-22 will be collected at baseline, after week 1 of therapy or sham, and after week 2 of therapy or sham. All results will be recorded via the App.

The PROMIS Sleep Disturbance Scale is a measure that assesses the pure domain of sleep disturbance in adults 18 years and older. It consists of 8 questions with possible

answers ranging from 1 - 5. This scale will be completed at baseline, after week 1 of therapy or sham, and after week 2 of therapy or sham. All results will be recorded via the App.

At the end of the two weeks participants will be asked one question regarding their thought about which arm of the study they were randomized to.

1.2 Study Endpoints

Safety and efficacy were evaluated by the following endpoints.
Primary Endpoints.

- Primary Safety as defined as a lack of serious adverse events (SAEs).
- Primary effectiveness as defined by a statistically significant improvement in nasal congestion sub-score of TNSS, comparing baseline congestion at screening versus daily congestion averaged over 2 weeks (Sonu vs. Sham).

Secondary Endpoints

- Secondary Safety as defined as a lack of adverse events (AEs).
- Secondary effectiveness as defined by a statistically significant improvement in 24-hour reflective TNSS comparing baseline TNSS at screening versus daily TNSS averaged over 2 weeks (Sonu vs. Sham).

2. STATISTICAL PLAN

The study will implement the intention-to-treat (ITT) principle, or, “analyze as randomized”, which is recognized as an important protection against bias, namely balancing both known and unknown factors and eliminating selection bias. We will first compare the study subjects demographic and clinical factors to ensure the comparability between two treatment groups. For categorical variables, counts and percentages will be calculated and chi-square test or Fisher’s exact test will be performed. For continuous variables, Shapiro-Wilk normality test will be performed, and either t-test or Wilcoxon rank test will be performed where appropriate. Changes in symptom scores and nasal congestion from baseline to follow-up visits will be evaluated using a paired t-test or signed rank test. Multilevel linear mixed models will be built to examine the association between treatment and outcomes. We chose this method because it handles unbalanced data and produces less biased significance than other analysis techniques- due to making use of all available data and incorporating the correlation between time points. Because there are only two time points, an unstructured correlation structure is used. The design effects include main effects of treatment group, time and the group by time interaction, while controlling for study subjects’ demographic and clinical factors. We will also examine the different effect between allergic vs non-allergic rhinitis by including it as a covariate and its interaction with treatment in the models. All the analyses use a two-sided test and $p<0.05$ is considered to be statistically significant.