**Neuromonics™ Tinnitus Treatment: Preliminary Experience in a Private Practice Setting**

David W. Jang, MD¹; Erika Johnson, AuD²; Sujana S. Chandrasekhar, MD, FACS¹,²

¹Mount Sinai School of Medicine, New York, NY
²New York Otology, New York, NY

**ABSTRACT**

**Educational Objective:** At the conclusion of this presentation, the participants should be able to identify the principles behind the Neuromonics™ Tinnitus Treatment (NTT) and understand its strengths and potential shortcomings.

**Objectives:** To describe the preliminary experience and efficacy of the NTT in an independent, non-industry sponsored private otology practice clinical study

**Study Design:** Case series with retrospective chart review and post-intervention quality of life questionnaire

**Methods:** Tinnitus Reaction Questionnaire scores, and awareness and disturbance scores, were obtained pre- and post-treatment. A post-treatment questionnaire based on the Glasgow Benefit Inventory (GBI) was conducted over the telephone.

**Results:** Eleven patients had completed the six-month program at the time of the study. Nine of the eleven patients completing therapy were considered “highly suitable”. TRQ scores were universally improved (ranging from a 3 to 78% decrease in the TRQ score). However, only two of the seven (29%) had achieved a decrease in the TRQ score by 40% or more. Seven of ten patients (70%), and four of ten (40%) patients reported a reduction in the percentage of time they were aware of and disturbed by their tinnitus, respectively. Eight of ten patients (80%) exhibited positive scores on the GBI (overall mean 17.39, median 7.81, range -3.0 to 67.6). When asked whether they thought the device was worth the cost, responses were divided equally between positive and negative responses.

**Conclusion:** Neuromonics™ Tinnitus Treatment appears to be a practical and promising treatment for tinnitus.

**INTRODUCTION**

The Neuromonics™ Tinnitus Treatment (NTT), which was recently approved by the FDA, targets tinnitus at multiple levels. Patients are instructed to listen to a headset device (Figure 1) for at least two hours a day for six months. During Phase I, which comprises the first two months, the device provides a customized broadband noise that stimulates deprived auditory pathways and masks the patient’s tinnitus. This broadband noise is embedded in pleasant music, in an effort to modify the patient’s emotional response to perceiving the tinnitus from a negative to a positive one. During Phase II, the noise is intermittently introduced, thereby desensitizing the patient and leading to a gradual reduction in awareness and disturbance of the tinnitus. Patients are seen periodically by a trained audiologist, or “tinnitus coach,” for counseling.

**METHODS AND MATERIALS**

Twenty-six patients seeking treatment for tinnitus in a private otology practice met the manufacturer’s suitability criteria and were offered Neuromonics™ Tinnitus Treatment. The suitability criteria included lack of significant hearing loss, absence of psychiatric disorder, lack of compensation related to tinnitus, decreased cognitive capacity, absence of current tinnitus treatment, and absence of aggravating factors (i.e. exposure to loud noises, ototoxic medications, disease processes, etc.).

The Tinnitus Reaction Questionnaire (TRQ), which is a validated survey measuring effects of tinnitus on everyday life, was given to patients before initiating and after completing therapy. Patients were also asked to quantify the percentage of time they are aware of their tinnitus (awareness score) and the percentage of time they are disturbed by their tinnitus (disturbance score).

The eleven patients who completed the therapy were asked to participate in a telephone survey, based on the Glasgow Benefit Inventory, which is a validated tool measuring quality of life changes after otolaryngological interventions. The survey consisted of eighteen multiple choice questions, and responses were graded on a five-point Likert scale and quantified.

Of the twenty-six patients who met the manufacturer’s criteria, eleven patients had completed the treatment, eight were currently under treatment, two had returned the device, two were lost to follow-up, and no data was available for three patients. Post-treatment TRQ and tinnitus awareness / disturbance scores were obtained within one month of completing treatment. Median follow-up time for the GBI was eight months (mean 8.3, range 1-17 months).

Nine of the eleven patients completing therapy were considered “highly suitable”, and the rest were “suitable”. TRQ scores were improved in all seven patients who completed both the pre- and post-treatment questionnaire, with a mean decrease of 34% (median 29%, range 3 to 78%). However, only two of the seven (29%) had achieved a decrease in the TRQ score by 40% or more. Seven of ten patients (70%) reported reductions in the awareness score with a mean decrease of 24% overall (median 22%, range 0 to 67%). Four of ten patients (40%) patients reported reductions in the disturbance score with a mean decrease of 22% (median 0%, range -50 to 85%).

**RESULTS**

Eight of ten patients (80%) exhibited positive scores on the GBI (overall mean 17.39, median 7.81, range -3.1 to 67.6). (Table 1) When asked whether they thought the device was worth the cost, responses were divided equally between positive and negative responses (definitely yes=2, probably yes=2, don’t know=2, probably not=2, definitely not=3).

<table>
<thead>
<tr>
<th>No. Patients</th>
<th>Positive Response</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
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<tr>
<td>Tinnitus Reaction Questionnaire</td>
<td>7/7</td>
<td>34 (3 to 78)</td>
<td>17.39</td>
<td></td>
</tr>
<tr>
<td>Awareness Score</td>
<td>7/10</td>
<td>24 (0 to 67)</td>
<td>7.81</td>
<td></td>
</tr>
<tr>
<td>Disturbance Score</td>
<td>4/10</td>
<td>22 (-50 to 85)</td>
<td>-3.1 to 67.6</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

Tinnitus is a challenging problem which can be greatly disabling for the patient and frustrating for the practitioner. Preliminary data has shown that the NTT is an effective treatment option for patients who meet certain criteria. In a large cohort study sponsored by the manufacturer, 92% of patients considered highly-suitable for the NTT experienced a 40% or greater reduction in the TRQ after undergoing treatment.

Although we did not see the same success rate in our initial experience, a decrease in TRQ scores and awareness/disturbance scores was seen overall in this case series. In addition, the GBI showed improved quality of life in 80% of patients, indicating that the Neuromonics™ device is a viable treatment option for tinnitus. The varied responses to whether the device is worth the cost may be a result of the high out-of-pocket cost associated with the treatment, which may influence patient satisfaction.

The results of this study should be interpreted with caution due to the small sample size, the lack of a control group, and the short follow-up time. However, it offers insight into maximizing the potential efficacy of the device in a clinical practice setting.

**CONCLUSIONS**

Although the high success rates of industry-sponsored studies could not be replicated, this preliminary study demonstrates the Neuromonics tinnitus treatment program to be a practical and promising treatment for tinnitus in a private practice setting. In this study, cost was a factor influencing patient satisfaction. Further studies with larger patient groups are necessary to better define patient selection criteria and evaluate cost/benefit ratio.

**REFERENCES**