Changes in Scores of Tinnitus Handicap Inventory Over Time

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INTRODUCTION

Tinnitus is the perception of a sound that has no acoustic source outside the perceiver's head (McFadden, 1982; Henry et al., 2002). Because there is no 'cure' for tinnitus perception, successful treatment prioritizes relief for the patient from the negative reactions to tinnitus. The Tinnitus Handicap Inventory (THI; Newman et al., 1998) measures the aspects of an individual's life that are affected by tinnitus. The THI is a 25-item self-assessment questionnaire that requires patients to respond either "yes," "sometimes," or "no" to indicators of the influence tinnitus exerts on emotions and daily activities. Responses are scored on a 4-2-0 scale, respectively, therefore THI scores can range from 0-100. Higher scores are indicative of greater perceived tinnitus handicap. Although the THI contains three subscales (functional, emotion, and catastrophic), Baguley and Andersson (2003) demonstrated that the subscales lack independence and that for statistical comparisons, the total scores are most reliable. Other studies (Hanscomb et al., 2006) indicated that individual items on the THI can be analyzed to identify those items that are most consistently endorsed among tinnitus patients. Newman et al (1998) concluded, "that the THI is a brief, easily administered, and psychometrically robust measure that evaluates the impact of tinnitus on daily living" (pg. 158).

PURPOSE

The purpose of this paper was to identify the changes in self-assessed tinnitus handicap over time in two groups of patients treated in a large tinnitus clinic. The two patient groups consisted of patients who (1) had tinnitus (T-only) and (2) had tinnitus and Post-Traumatic Stress Disorder (T+PTSD). Aspects of tinnitus amenable to treatment were compared across groups. The primary instrument for measuring these changes was the THI.

METHODS

Participants: A total of 282 individuals who had been followed for at least 6 months in a large veteran's tinnitus clinic participated in this study. Eighty-seven participants were in the tinnitus and PTSD group (T+PTSD group) and 195 were in the tinnitus-only group (T-only). The mean hearing sensitivity was comparable within and between groups. **Figure 1** displays a mean audiogram and is representative of both ears in both participant groups.

Procedures: The THI was administered to each participant at intake (pre-THI), and at least one other time over the course of the next 6-24 months, either in person or by mail (post-THI). The mean length of time between administrations of the pre- and post-THI was 12.3 months (*SD* = 5.1).

METHODS (con't)

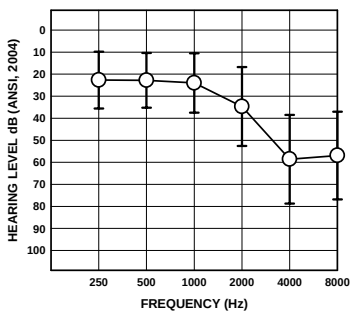

Figure 1. Mean representative audiogram (and one standard deviation).

Tinnitus Management: The participants were treated at the Audiology clinic at the Mountain Home Veteran Affairs Medical Center. The initial assessment included audiometric evaluation, electrophysiologic and vestibular testing when indicated, and several tinnitus intake forms, including the THI. Tinnitus management was conducted in individual sessions that included detailed counseling prioritizing information pertaining to tinnitus mechanisms and disruptions, dialogue regarding the participant's experiences with tinnitus, and in most cases (>90%) the recommendation of sound enrichment. Concurrent enrollment or treatment in the appropriate VA sections were confirmed for participants in the T+PTSD group.

RESULTS

A repeated measures analysis of variance (ANOVA) showed a significant main effect for group (T+PTSD, T-only), F = 12.9, df = 1, p < .05, suggesting group differences in THI scores when collapsed across time. A main effect for time (Pre-THI vs Post-THI) also was found, (F = 55.9, df = 1, 279, p < .05), suggesting differences in THI scores regardless of group. The ANOVA also revealed a significant interaction (F = 8.2, df [1,279], p < .05) suggesting that one group had a significantly higher change in THI scores over time compared to the other group. The T+PTSD group had higher pre-THI scores (M = 63.6, SD = 20.5) than the T-only group (M = 49.7, SD = 23.5), and thus, a larger improvement in THI scores. Both groups had a significant decrease in scores between the pre-THI scores and post-THI scores. Both groups had comparable post-THI scores (T+PTSD group: X = 46.0, SD = 22.3 and T-only group: X = 41.8, SD = 25.6).

RESULTS (con't)

Figure 2 illustrates the mean pre-THI and post-THI scores for each group. These results suggest that the T+PTSD group assessed tinnitus handicap as more severe than the T-only group and that the sound and counseling-based tinnitus management strategy was more effective for the T+PTSD group.

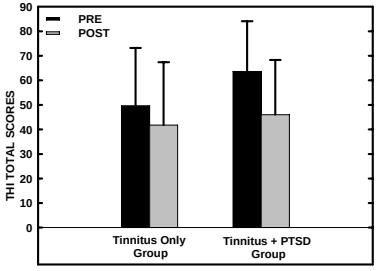

Figure 2. Mean pre-THI total scores (black bars) and post-THI total scores (gray bars), with on standard deviation, for each group.

To evaluate which THI items contributed most substantially to the differences between groups over time, a paired t-test with Bonferroni corrections was conducted for each item (pre vs post) for each group. The THI items that contributed most to the overall decreases in score in the T-only group were questions regarding escaping tinnitus, frustration, control over tinnitus, and coping with tinnitus (items 8, 10, 19, and 23, respectively). **Figure 3** illustrates the change in responses for the four items on the THI that were significantly different between pre and post sessions in

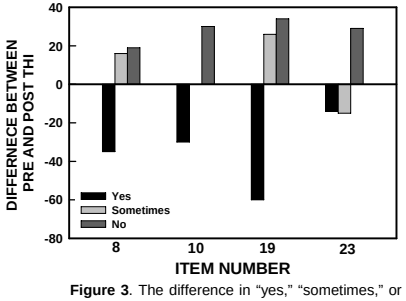

Figure 3. The difference in "yes," "sometimes," or "no" responses on individual THI items that were significantly different between pre-THI versus post-THI in the T-only group.

RESULTS (con't)

The THI items that changed the most over time for the T+PTSD group included handicap in 1 (concentration), 5 (desperation), 9 (enjoyment of social activities), 10 (frustration), 12 (enjoyment of life), 16 (upset feeling) 17 (family/relationship stress), 18 (focusing attention), 19 (control over tinnitus), 21 (depression), 23 (coping), and 25 (feeling insecure). **Figure 4** illustrates the change in responses for the 10 items on the THI that were significantly different between pre and post sessions in the T+PTSD group. Both groups experienced significant change in handicap on the items relating to frustration, control, and coping with tinnitus.

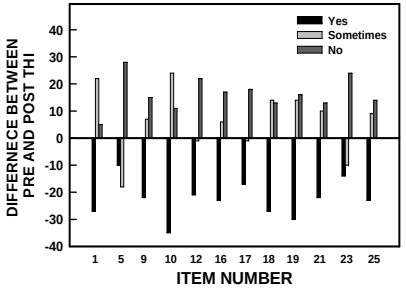

Figure 4. The difference in "yes," "sometimes," or "no" responses on individual THI items that were significantly different between pre-THI versus post-THI in the T+PTSD group.

DISCUSSION

The T+PTSD group had significantly higher pre-THI scores than the T-only group, suggesting that individuals with PTSD perceive themselves as more handicapped by their tinnitus than individuals with tinnitus only. Both groups reported decreased THI scores over time and the post-THI scores were similar between the two groups. Therefore, self-assessed handicap caused by tinnitus was exacerbated less by PTSD at follow-up than at intake. While the intervention was more effective for the T+PTSD group than the T-only group, the greater perceived benefit also might have been due to the greater initial tinnitus handicap reported by PTSD patients. The T+PTSD group response changes were consistent with patient reports that tinnitus and PTSD exacerbated one another under a variety of circumstances (Fagelson, 2007). Our management strategy reduced tinnitus handicap, particularly in the T+PTSD group, and also may reduce the severity of PTSD symptoms (i.e., by affecting concentration, depression, the sense of coping, etc.) as the two disorders share these attributes. Additional research, however, is needed to determine the benefit of tinnitus treatment on PTSD symptoms.

SUMMARY

The purpose of this paper was to identify the changes in self-assessed tinnitus handicap over time in patients with tinnitus only and patients with tinnitus and PTSD. The major findings were as follows:

1) The pre-THI scores were significantly higher for the T+PTSD group then for the T-only group.
2) 2) Both groups had a significant decease in pre-THI versus post-THI score, and both groups had comparable post-THI scores.
3) The THI items that contributed most to the group differences were related to anger, desperation, depression, anxiety, insecurity, and ability to cope.
4) Although items related to control over tinnitus, sleep, concentration, and frustration contributed substantially to the change in THI scores, they did so to nearly an equal degree across groups.

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