**Introduction**

- Millions of people suffer from a chronic ringing, hissing or buzzing noise known as tinnitus.
- Tinnitus can have a serious impact on quality of life, leading to sleep deprivation, depression, and even suicide.
- Tinnitus is thought to persist due to changes in the central auditory system that are mediated by brain plasticity.
- A computational model of the “tinnitus brain” was used to simulate these changes and predict how to minimize tinnitus by taking into account a participant’s audiogram and tinnitus pitch.
- The end product is a personalized music-based therapy.

**Objective**

The present trial was conducted to assess the effects of a customized music-based sound therapy that incorporated a computational model of the “tinnitus brain” in reducing the perception of tinnitus at 3, 6, and 12 months.

**Methods**

**Sample:** Participants (N=50) were recruited from within and around the Hamilton community in Ontario, Canada. Participant characteristics included:
- Presence of unilateral or bilateral tinnitus ≥ 1 year.
- No history of neurological or psychiatric disorders, or any medical disorder that would affect their response to therapy.
- Between 18 to 75 years old.
- Obtained Tinnitus Handicap Inventory (THI) score ≥26 and absolute hearing thresholds ≤20dB for frequencies <8kHz.
- Agree to commit to the study for 12 months, and to the daily use of the music therapy.

**Design:** This was a parallel, two-arm, randomized, double-blind, placebo-controlled trial.

**Outcomes:** Differences in mean scores of the Tinnitus Handicap Inventory (THI) and Tinnitus Functional Index (TFI) (both at 3, 6, and 12 months). Both measures are psychometrically reliable.

**Results**

- **Baseline:** Using paired t-tests and t-tests, demographic variables (age, sex, type of tinnitus) and baseline THI scores of placebo (n=22) and treatment (n=28) groups were found to be balanced between both groups.
- **3 months:** For THI, an analysis of covariance (ANCOVA) was conducted. The covariate (THI score at baseline) was included to control for the differences on the predictor (group assignment) when assessing the outcome (THI score at 3 months). For TFI, paired samples t-tests were conducted for the overall TFI score, and the 8 subscales.

**CONCLUSIONS**

The THI and TFI results of this study suggest that at 3 months, the personalized music-based therapy can result in a clinically significant reduction in tinnitus. The results are also consistent with observations from an earlier pilot study: music can harness brain plasticity in the auditory system to reduce tinnitus and related symptoms. The next step will be to determine whether a greater reduction in tinnitus is possible at the 6-month follow-up, as was reflected in our pilot study. Future directions include disseminating the results to the community.

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