INTRODUCTION

We are very grateful to the author(s) of this letter for taking the time to read and respond to our article [1]. With all our respect, we reviewed their thoughtful letter which raised the important issue concerning the optimal stimulus for sound therapy implemented in tinnitus retraining therapy (TRT). The major issue that they wanted to point out was that the broadband noise TRT (bTRT) group had more severe tinnitus (THI= 54.22 ± 22.41) compared to mixed noise TRT (mTRT) (THI= 42.5 ± 22.27) and narrowband noise TRT (nTRT) (THI= 48.25 ± 25.56) group. And since patients with more severe tinnitus tend to show higher improvements compared to those with milder form of tinnitus [2], it seems possible that the superior performance of bTRT could also be contributed by the tinnitus severity factor. Their recommendation was to perform a future study with subjects who have almost equal baseline tinnitus severity scores or to perform an analysis of covariance (ANCOVA) with the baseline tinnitus severity as the covariate.

We agree with the shortcoming of our article that the authors have pointed out. The tendency of better outcome in the more severe tinnitus groups has also been found in previously published article regarding the prognostic factors of TRT [3]. Although we tried to control all confounding factors, a few variables which might influence the outcomes were basically not manageable, because of the retrospective design of our study. Accordingly, in this correspondence article we have reanalyzed our data and tried to advocate that broad band noise therapy may be preferable in TRT, even after controlling the pretreatment severity of tinnitus induced distress.

MATERIALS AND METHODS

Details on groups and interventions are explained in the former article [1]. Briefly, Thirty-eight adults with subjective idiopathic tinnitus who were followed for at least 9 weeks were enrolled. Sound therapy was delivered in 3 different ways: nTRT (n=8), mTRT (n=12), bTRT (n=18). Treatment response was measured through validated psychometric questionnaires: THI, visual analog scale on annoyance, and numerical description of hours of tinnitus perception (awareness hours). In order to verify if the pretreatment severity of tinnitus had a major influence on the final outcome, three additional analyses were done. First, in order to verify if the difference in pretreatment baseline THI score was significantly different between groups, we compared the mean baseline THI score among 3 groups using analysis of variance. Tukey test was performed for post hoc test. Second, we performed an ANCOVA putting the baseline THI score as the covariate. This analysis did not seem feasible for our data set, since the posttreatment mean THI score did not show a significant difference between groups from the first place, when the baseline THI score was not considered as a covariate. Although it was sure to be not-significant, we performed the analysis to be respectful to the query. Third, we stratified the subjects, so that the baseline THI score of each subject in the three groups would match one-to-one. Since there were 8 subjects in the nTRT group, 8 subjects were selected objectively from the mTRT and bTRT group, whose baseline TRT score match with that of the nTRT group. The success rate (improvement in THI score > 7 points) was compared between the three groups [4].

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**RESULTS**

When the pretreatment baseline THI scores were compared, it was approximately 12 points higher for the bTRT group than the mTRT group and 6 points higher for the bTRT group than the nTRT group. But this difference did not reach a statistical significance ($P=0.399$). Also, the post hoc test did not prove a significant difference between bTRT and mTRT ($P=0.370$) or nTRT ($P=0.815$).

According to an ANCOVA with the initial THI score as the covariate, 1–5 weeks after TRT the THI score was 47.0±4.8 points in the nTRT group, 42.6±4.0 points in the mTRT group, and 41.4±3.3 points in the bTRT group. As we have expected, no significant difference was found between the three groups even when the baseline TRT score was set as a covariate ($P=0.627$). Nine to 13 weeks after TRT the THI score was 44.5±7.1 points in the nTRT group, 32.0±5.9 points in the mTRT group, and 31.3±4.8 points in the bTRT group. No significant difference was found at this time point either ($P=0.288$).

When the data set was stratified according to the pretreatment THI score (8 subjects for each group), the baseline severity of tinnitus was almost identical between the three groups (Table 1). The success rates of the three groups were 37.5% in the nTRT group, 63.5% in the mTRT group, and 87.5% in the bTRT group. And this linear by linear association was statistically significant ($P=0.043$).

**DISCUSSION**

From our additional analyses, it seems that broad band noise therapy may be preferable in TRT, even after controlling the pretreatment severity of tinnitus induced distress. That is, although the pretreatment baseline THI score was higher in the bTRT group, this difference did not seem to be substantial ($P=0.399$). Also, when we stratified the subjects so that the baseline THI score is identical between the three groups, the success rate was significantly higher in the bTRT group ($P=0.043$). And, these findings are in line with the main results of our prior article [1]. We did not find a significant difference in the posttreatment mean THI score when ANCOVA analysis was done with the baseline THI score as a covariate. But this seems to be a logical result, since we were not able to find a significant difference in our prior article, even when the baseline THI score was not set as a covariate. Taking the baseline THI score into consideration would act as a factor that favor the null hypothesis, so the ANCOVA does not seem to be an appropriate statistical alternative in our case.

We do admit that there are many shortcomings in our prior article and also this additional analysis. But majority of the problems are due to the retrospective design of this study. It would have been ideal if we had carried out a randomized prospective trial, but unfortunately this was not the case. Despite these shortcomings, we do think that broad band noise therapy rather than mixed noise or narrow band noise is preferable in managing tinnitus patient during TRT.

**CONFLICT OF INTEREST**

No potential conflict of interest relevant to this article was reported.

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