**LETTERS TO THE EDITOR**

**Longitudinal Aspect of Case-Control Analysis**

We recently read with interest the article “Case-Control Analysis of Cochlear Implant Performance in Elderly Patients” by Friedland et al. It is our opinion that, despite the title, the study did not use a case-control design because of the longitudinal aspect of the study. Also, patients were not selected according to the outcome of interest, as is the procedure for a case-control study; instead, patients were selected with respect to age, a possible exposure category. The selection criteria suggest that the study actually used a cohort study design, with one-half of the analysis a basic cohort analysis and the other half a matched cohort analysis, with patients matched on duration of deafness and preimplantation Hearing in Noise Test–Quiet (HINT-Q) score.

Because of the matching of younger and older patients, a paired t test should have been used to test for differences in the matched pairs; however, it appears that the 2 groups were inappropriately treated as independent. The authors conclude that there were significant differences by age group in Consonant-Nucleus-Consonant (P = .02) and HINT-Q (P = .02) scores 1 year after implantation; however, analysis using a paired t test for the matched cohort data provided in the table suggested that there were no significant differences by age group in Consonant-Nucleus-Consonant (P = .06) or HINT-Q (P = .07) scores. Therefore, the conclusion that elderly patients should not be expected to have hearing scores as high as those of younger patients with similar characteristics cannot be supported statistically, as the P values exceeded .05 (acknowledging that the absolute differences remained unchanged).

Finally, as with any longitudinal study, it is possible that the results are biased because of a regression toward the mean. If this bias were differential between the older and younger cohorts (eg, younger cohorts were more likely to have extreme measurements of hearing tests in relation to their true mean scores), then both the validity and the interpretation of the results are questionable. The authors should review the literature on the topic of testing and correcting for regression to the mean and determine whether this particular bias is present in their data.

While the results of the current study are questionable for the reasons stated, we hope that the authors take heed of our suggestions and correct the results, accounting for the matched cohort study design. We look forward to seeing the corrected results from this study.

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**In reply**

We appreciate the comments of Vogtmann and colleagues regarding our article “Case-Control Analysis of Cochlear Implant Performance in Elderly Patients.” However, we maintain that characterizing the principal component of our study as a case-control analysis, the results of which are shown in Figures 3 and 4 in our article, is appropriate, and, as such, the statistical analyses are also correct. The description of this component of the study as “longitudinal” is incorrect and may account for the suggestion that our analysis represents a cohort study. Our study measured a single outcome (speech perception) at a single time point (1 year after implantation) among patients who were stratified by elderly (case) and nonelderly (control). To ensure equivalency of initial residual hearing, these patients were retrospectively matched by 1 measure of speech perception at initial presentation. We stand by our conclusion that elderly patients do very well with cochlear implantation but that outcomes are more variable and less robust than in younger adults.

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