ABSTRACT

Recently we demonstrated the results of a two-tone experiment which indicated that the frequency distribution of OAE responses to noise was not that of normally-hearing subjects.

DATA COLLECTION

A standard distortion product otoacoustic emission (DPOAE) probe is sealed in the ear canal of the subject. The tone is then played at a constant level and the OAE signal is recorded. After the probe tone is removed, the OAE signal is recorded again. The difference between the two signals is then calculated and analyzed. This process is repeated ten times, taking 2 minutes, and the 10 response sequences gathered with the probe and masker tone are used to calculate the peak-to-peak amplitude of the OAE signal.

INTRODUCTION

Previous work has shown mechanical behaviour in the basal region of the basilar membrane in guinea pig preparations analogous to those measured in humans. However, it is important to note that the mechanical behaviour observed in humans has not been measured directly in the human ear canal. Transducers have been used to measure mechanical behaviour in the ear canal, but these transducers are not sensitive enough to detect the small movements of the basilar membrane.

ANALYSIS

The sum and difference of each phase-reversal pair is computed. The resulting signals are then analyzed to determine the presence of any distortion products. The resulting signals are then filtered to remove any low-frequency noise, and the signals are averaged to increase the signal-to-noise ratio.

RESULTS

Individual responses seem contaminated by considerable noise on the baseline data (Fig. 5). In contrast, the OAE signals obtained from the same subject in the presence of noise are significantly less contaminated by noise. This is evident from the fact that the OAE signals obtained from the same subject in the presence of noise are much less variable than those obtained from the same subject in the absence of noise. This is likely due to the fact that the OAE signals obtained from the same subject in the presence of noise are less influenced by external noise sources.

DISCUSSION

In this study, we have shown that the presence of noise significantly affects the OAE signals obtained from the same subject in the presence of noise. This is evident from the fact that the OAE signals obtained from the same subject in the presence of noise are much less variable than those obtained from the same subject in the absence of noise. This is likely due to the fact that the OAE signals obtained from the same subject in the presence of noise are less influenced by external noise sources.

CONCLUSIONS

The results of this study suggest that the presence of noise significantly affects the OAE signals obtained from the same subject in the presence of noise. This is evident from the fact that the OAE signals obtained from the same subject in the presence of noise are much less variable than those obtained from the same subject in the absence of noise. This is likely due to the fact that the OAE signals obtained from the same subject in the presence of noise are less influenced by external noise sources.

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