ABSTRACT

Wideband changes in energy reflectance induced by the contralateral acoustic stapedius reflex were examined in six-week-old infants and in young adults using wideband admittance and energy reflectance (YR). The probe consisted of 4 kHz electrical chirps with a bandwidth of 0.2 to 4 kHz. The overall level of the chirps was set at 65 dB SPL for adult testing and 65 and 55 dB SPL for infant testing as calibrated in a Zoellner occcluded ear simulator. The reflex activator presentation was a band-pass noise from 2.5 to 10 kHz presented at a maximum overall level of 95 dB SPL measured in the ear canal. An electronic noise was controlled in the presence of the baseline activator by using the ER-10C microphone system (Etymotic Research, Inc.). The reflex activator was required for each subject to complete the reflex for adults and infants unless the subject's state precluded additional measurements.

Reflex-induced YR shifts were then obtained by subtracting measurements obtained during and baseline from those obtained in the presence of the contralateral activator noise. 

RESULTS

1. The overall patterns of reflex-induced YR shifts in infants are similar to those of adults. However, compared to adult data, the mean positive peak of the YR shift was at a higher frequency in the infants, suggesting a higher middle-ear resonance frequency for infants. This may be affected by the ear canal admittance for YR measurements. However, ER shift should be independent of probe position in the ear canal (Simons et al., 1982).

2. Reflex correlation analysis for the infant data showed the 1000 to 8000 Hz bandwidth as the frequency region most often resulting in the detection of a reflex response compared to 250 to 2000 Hz in adults.

3. The results are promising for the investigation of acoustic reflex development.

CONCLUSIONS

1. The results provide evidence that the pattern of reflex-induced YR shifts in infants is similar to those of adults. However, compared to adult data, the mean positive peak of the YR shift was at a higher frequency in the infants, suggesting a higher middle-ear resonance frequency for infants. This may be affected by the ear canal admittance for YR measurements. However, ER shift should be independent of probe position in the ear canal (Simons et al., 1982).

REFERENCE