research literature that examines the accuracy of ASSR and TB-ABR in estimating behavioural thresholds of infants. The secondary objective was to generate recommendations for clinicians and for future research based on evidence-based results.

Methods

Search Strategy

Database searching of CINAHL, PubMed, and MEDLINE-OVID were investigated using the following strategy:

((auditory steady-state response) or/and (tone-burst auditory brainstem response) or (evoked-potentials)) and (threshold estimation)

The search was limited to articles with infant subjects. This search strategy was unsuccessful as most of the articles investigated the click ABR; an electrophysiological measure that lacks frequency specificity. I then consulted with a couple of faculty members with backgrounds in evoked-potential testing regarding current studies in this area. The reference lists of the articles gathered lead to more relevant resources.

Selection Criteria

Studies selected for inclusion in this review paper were required to investigate the accuracy of ASSR and TB-ABR estimations of thresholds in the infant population.

Research Design

Results of the literature search yielded three articles congruent with the aforementioned selection criteria: retrospective (2), longitudinal (1). Two of the three studies used large samples obtained via convenience sampling from screening referrals, laboratories, clinical facilities, and other outside agencies. The exclusion criteria included infants with evidence of middle ear pathology, auditory neuropathy, or evidence of progressive hearing loss. The final study reviewed used a small sample size recruited from one particular nursery in an Australian hospital which may result in a selection bias. The studies reviewed involve no random selection of the participants and do not illustrate an attempt to ensure that the sample is an accurate representation of the infant population; an indication of reduced

and 4000 Hz with single stimuli presented monaurally. Both ASSR and behavioural testing were performed in a sound-attenuated room using insert earphones or TDH-39 headphones. A total of 809 comparisons were made between ASSR and behavioural thresholds across the tested frequencies.

Results suggest that ASSR and behavioural thresholds are highly correlated for each frequency with the overall Pearson r value of .97. In a previous study by Rance et al. (1995), a linear regression equation was applied to older children and adults' ASSR thresholds to predict behavioural thresholds. When the linear regression lines were fitted to the data etressard

the two techniques were more similar at 500 Hz, with ASSR thresholds being significantly higher than TB-ABR thresholds at birth only. Analysis of variance measures indicated no significant difference in group mean thresholds over time for either test, with the spread of evoked potential thresholds broader for ASSR compared to TB-ABR. However, mean thresholds for TB-ABR and ASSR results are similar when the stimuli were calibrated in the same units (dBpeSPL). The researchers note that the threshold level of the evoked potential does not determine its accuracy of one's true threshold; however, it is the consistency of the response across time that is important.

A four-way repeated-measures analysis of variance was performed to investigate within-subject trends. A significant test effect indicated that ASSR thresholds exceeded TB-ABR thresholds by 12.1 dB on average with the test difference greatest at 4000 Hz. Overall, analyses of variance showed that within each subject, ASSR thresholds are more affected by

Recommendations for Clinical Practice

Clinical utility for using ASSR to estimate hearing thresholds in infants is promising, yet further research supporting its accuracy is warranted within the infant population. ASSR procedures are still rudimentary and with further support for its clinical accuracy, they should only be used in conjunction with TB-ABR. TB-ABR is the method used in the Ontario Infant Hearing Program's protocol due to its sufficient research, clinical database, and accuracy of estimating thresholds in young infants and should continue to be the primary measure for estimating thresholds in this population.

References

Note: References marked with an asterisk indicate studies included in the critique.

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