

Study 1: threshold estimates compared to other measures



Study1: comparison of ASSR with ABR results This study demonstrated that the threshold estimation using the ABR and ASSR could be used to predict the pure-tone threshold in infants and children. To obtain the results, Behavioral Threshold Tests, ABR Threshold Tests and ASSR Threshold Tests were conducted. Result: The discrepancy between behavioral and evoked potential threshold was generally smaller for ASSR than for ABR. The correlations of c-ABR with pure-tone thresholds were moderately robust. However, at 1 and 2 kHz, the pure tone-ABR correlation coefficients slightly exceeded those for the ASSR. Discussion: - These data indicate that both c-ABR and ASSR threshold estimates can be used to predict pure-tone threshold for infants and children. - The differences between the ABR and ASSR correlation coefficients were small. In addition, both click ABR and ASSR have strong and statistically significant correlations.

- The correlations between the c-ABR threshold and the ASSR thresholds were also statistically significant. Strengths: - In this study ABR, ASSR, and behavioral threshold correlations were addressed. However, the previous studies were only address ASSR and behavioral threshold correlations.

Weakness: - Differences in thresholds when measured in the ear canal for the adult and infant. - More than half of the sample are sensorineural hearing loss, so the sample distribution was not equal. - Some observer may have bias to the response based on the audiometric result.

Study2: Direct comparison of ASSR and tone bursts evoked ABR This study provided evidence that there was similarity in threshold estimation when

automatic detection was used in ABR and ASSR algorithm. However, the threshold estimation varied with frequency, stimulus rate, and detection method. ASSR tests were carried out using 500- and 4000-Hz. Response Detection include visual detection and automatic

detection. Result: Thresholds for 500 Hz were elevated in comparing with 4000 Hz. In regards to stimulus type, threshold for the tone bursts were elevated. Discussion: - Visual detection of the 500-Hz tone burst ABR resulted in significantly lower threshold estimates compared to other measures at 500 Hz, and the 500 Hz ASSR at 74 Hz resulted in the highest threshold estimates.

- Visual detection of toneburst ABR at 4 kHz also resulted in the lowest threshold estimate, but this was not significantly different from the estimate obtained for ASSR at 95 Hz. Strengths: - Previous studies comparing ASSR to tone burst ABR have employed visual detection alone for ABR threshold estimates and have only compared tone ABR to ASSR at one frequency. However, this study includes findings at more than one frequency. - All participants had normal pure tone thresholds and normal results in tympanometry. Weaknesses: - ASSR is not approved by Food and Drug Administration (FDA). - Most of the participants slept during testing ASSR and the thresholds were lower. - Only one ear was tested for each participant in both ABR and ASSR - No formal assessment was made of subject status during the experimental procedures. - Difficulties remain in comparing threshold estimates for tone ABR and ASSR because of the difference in stimuli used.

What did I learn:- Frequency specificity, response generators, the effects of hearing loss, and automatic detection algorithms should be considered when comparing the two evoked potentials.- A disadvantage of ABR is the subjective nature of response detection. However, ASSR use objective detection using a set of statistical criterion previously obtained.