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Comparison of response thresholds derived from auditory steady state responses (ASSRs), tone pip-evoked auditory brainstem response (ABR) and click-evoked ABR with respect to their suitability for hearing aid fitting in small children

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The ASSRs has found its application in fitting of infants and small children with hearing aides. In a comparison study we investigated ASSRs estimated audiogram and tone pip-evoked ABR with respect to ease of evaluation and measurement duration. We examined 94 children (age 1 to 106 months) with click-evoked ABR, ASSRs and tone pip-evoked ABR with the GSI Audera device. First we found the individual means of thresholds in four frequencies (0.5, 1, 2 and 4 kHz) by tone pip-evoked ABR and of values in same frequencies from ASSRs estimated audiogram and correlated these to the thresholds of click-evoked ABR. Second we analysed the discrepancy of ASSRs and tone pip-evoked ABR results from single frequencies to the mean of the four frequencies in the same individual. A significant correlation between the click-evoked ABR thresholds to threshold means of tone pip-evoked ABR and for value means of ASSRs was found. By analysing the discrepancy from single thresholds of tone pipe-evoked ABR to the mean of the corresponding four frequencies, we found considerable differences. The 0.5 kHz thresholds from tone pip-evoked ABR were significantly below the average in normal hearing and mild hearing loss but had better congruency in higher hearing loss. The single frequency results from ASSRs compared with the mean of the corresponding four frequencies had considerable discrepancy in mild to moderate hearing loss. There was no tendency which frequency was affected or whether the results were over- or underestimated. Conclusion: We cannot recommend ASSRs measurement to serve as the only basis for hearing aid fitting in small children and infants, because there is no predictable tendency to over- or underestimation of results in mild to moderate hearing loss.

