

Hidden Hearing loss in children with APD?

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Objectives: To examine extended high-frequency hearing, auditory discrimination, and neural responses in children with auditory processing disorder (APD) and typically developing children and adults with no listening complaints.

Background: Around 3-6 % of school-age children and 5-15 % adults have listening complaints, despite the presence of normal hearing thresholds at standard audiometric frequencies. In recent years hidden hearing loss (HHL) has gained attention as the possible reason for listening complaints in individuals with normal hearing sensitivity. Individuals with HHL have been found to have reduced auditory nerve action potentials and EHF thresholds (9 to 16 kHz) but normal hearing thresholds at standard audiometric frequencies.

Methods: Fifteen children with APD, 14 typically developing children and 12 adults with no listening complaints participated in this study. Hearing thresholds were obtained at standard audiometric frequencies and EHF thresholds. Word in noise (WIN) scores, 1000 Hz frequency discrimination thresholds and click-evoked auditory brainstem responses (ABR) were obtained from these participants.

Results: There were no significant group differences in hearing thresholds at standard audiometric frequencies. Adults showed significantly elevated hearing thresholds at EHF thresholds and reduced auditory nerve action potentials compared to typically developing and APD children. However, adults' frequency discrimination and WIN scores were not affected. Children with APD showed significantly poorer frequency discrimination and WIN scores compared to typically developing children and adults. Individual children with APD showed abnormal ABRs with normal hearing thresholds at EHF thresholds.

Conclusions: This group of children with APD showed elevated frequency discrimination thresholds and WIN scores but demonstrated normal hearing sensitivity at EHF thresholds. Adults with elevated thresholds at EHF tended to show reduced amplitude of auditory nerve action potential (wave I of the ABR) without affecting auditory discrimination or reducing speech in noise abilities. The question of an association between hearing thresholds at EHF and listening difficulties remains open.