

Benefits for speech recognition and sound localization in children with bimodal hearing

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Background

For children with severe-to-profound hearing loss in one ear and aidable acoustic hearing in the contralateral ear, the standard of care supports provision of a bimodal fitting with a cochlear implant (CI) and a hearing aid (HA). However, it remains a clinical challenge to assess any bimodal benefit in young children, thus complicating clinical management.

Aim

To quantify bimodal sound localization and speech recognition benefits in children.

Methods

Participants were recruited from medical unit Ear nose throat, hearing and balance at Karolinska university hospital. Inclusion criteria: user of CI and HA (minimum of 6 months use), <16 years of age, and the ability to participate in tests. Monosyllabic word recognition in quiet and in spatially separated multi-source noise (signal-to-noise ratio=0 dB) was tested for children > 5 years of age, and horizontal sound localization for children of all ages, in a within-subject repeated measures design (bimodal vs. CI-only).

Results

Thirty-four children fulfilled the inclusion criteria and 20 children (3.6 to 15.7 years of age) agreed to participate. Preliminary findings indicate a bimodal benefit for speech recognition in quiet (83% vs. 67% correctly identified words, n=14, p=0.03) whereas speech recognition in noise was similar across listening conditions (68% vs. 65%, n=11). Sound localization results are being analyzed and will be presented.

Discussion

Preliminary results contrast with children using bilateral CIs, for which speech recognition performance in quiet is similar using unilateral and bilateral CIs, whereas a bilateral benefit exists in noise.