

Early intervention and cortical evaluations optimise outcomes for children with hearing loss

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Abstract:

Introduction. Permanent childhood hearing loss has a significant negative impact on children's development. With implementation of universal newborn hearing screening programs, it is now possible to detect and treat hearing loss early in life. The effect of early intervention for improving outcomes of children with hearing loss is quantified in the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study, a prospective population-based study in Australia.

Methods. The LOCHI cohort comprises 450 children, 163 of whom first received their cochlear implants (CIs) before 3 years of age. Of these, about half received their implants before 12 months of age. Demographic and audiological characteristics, including CI maps were collected, and speech and language outcomes were assessed using standardized tests and custom-designed tests in a prospective manner. Multiple regression analyses were used to determine the factors, including age at implantation, on language outcomes at 5 years of age. The influence of aetiology and age at implantation on CI characteristics was examined.

Results. The study found that children who received early implantation had better language outcomes. On average, children who received CIs at 24 months had poorer language than those implanted at 6 months (-21.4; 95% CI: -33.8 to -9.0). Whereas children who received CIs between 12 and 36 months achieved optimal CI maps within 6 months of implantation, those who received CIs at a younger age took longer. Drawing on findings from a related study, we propose that measurements of cortical auditory evoked potentials be used to optimize CI maps and monitor progress after implantation in young children.

Conclusion. The findings guide evidence-based management of children born with severe or profound degrees of hearing loss. Timely intervention and cortical evaluations of the effectiveness of hearing devices are key to maximising outcomes.

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