Cochlear Implants Show Benefit in Deaf Children With Developmental Delays

— Implants should be considered regardless of severity of impairment, researchers argue

by Michal Ruprecht, Editorial Intern, MedPage Today
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Cochlear implantation carried various benefits over hearing aids for young children with deafness and early development impairment (EDI), a prospective cohort study found.

In children with low cognitive and adaptive skills followed for an average of 2 years, those who continued using hearing aids saw slower improvements in adaptive function, as well as in cognitive, language, and auditory skills compared to children who received cochlear implants, with estimated coefficients ranging from -0.119

to -0.243 ($P \leq 0.04$), reported John Oghalai, MD, of the University of Southern California in Los Angeles, and colleagues.

Children in the hearing-aid group also had higher scores on the Parenting Stress Index (PSI; 1.328, 95% CI 0.208-2.448, $P=0.02$), according to their findings in *Pediatrics*.

"We provide the most compelling data available that cochlear implantation in children who are born deaf and who have EDI is associated with better developmental outcomes and faster rates of development in multiple domains than continued use of hearing aids," the authors wrote. "To give all children the best opportunity to fully develop their maximum potential, cochlear implantation should be carefully considered regardless of the presence of severe developmental delays."

EDI typically involves "pretty severe abnormalities, those in which the child would probably later on be diagnosed with intellectual disabilities," Oghalai explained in a video that accompanied the study. "These children probably would never learn to speak, even if they could hear normally."

But some children with deafness and EDI appeared to do better and communicate more with their parents after receiving cochlear implants, said Oghalai, and parents' perceptions of how their kids were doing also seemed to improve.

"And so we started a prospective cohort study to find out: is it better to implant these children, or is it better to have them continue to use hearing aids?" he said. "Right now, the question's not clear -- many insurance companies don't cover cochlear implantation for these children, and many centers won't implant these children."

Their study drew from three groups of children receiving care at Texas Children's Hospital in Houston and Lucile Packard Children's Hospital Stanford in Palo Alto, California from 2009 to 2017.

Children who scored two standard deviations (SD) below the mean for their age group on the Mullen Scales of Early Learning (MSEL) were categorized as having low nonverbal cognitive skills, while those who scored one SD below the mean on the Vineland Adaptive Behavior Scales (VABS) were categorized as having low adaptive skills. Other assessments included the LittlEARS Auditory Questionnaire, and the Preschool Language Scale.

There were two groups who met criteria for EDI (both low cognitive and low adaptive skills) and received either a cochlear implant (n=37; mean age 24 months at initial assessment) or continued using a hearing aid (n=29; mean age 37 months), and a third group with normal cognitive and adaptive skills who also received a cochlear implant (n=138; mean age 19 months at initial assessment). The three groups did not differ substantially, with the majority in each being white (59-82%), and pre-term births being higher among the two groups with EDI.

The larger group of children with normal cognitive and adaptive skills showed faster improvements in adaptive function, as well as in cognitive, language, and auditory skills compared to the hearing-aid group, with estimated coefficients of 0.166 to 0.403 ($P \leq 0.001$), Oghalai's group reported. This group also had lower parental stress on the PSI than the hearing-aid group.

Knowing denial of insurance coverage for cochlear implants due to EDI is common, providers are often hesitant to refer patients for cochlear implant evaluations in the first place, the researchers noted.

"For example, we found that children with EDI who continued with hearing aid use were older and had lower auditory skills at initial evaluation than children who went on to receive a cochlear implant," wrote Oghalai and colleagues.

The study results have health policy implications not only for private insurers but also for large, statewide, publicly administered programs, the researchers said. "Cognitive and adaptive skills should not be used as a 'litmus test' for pediatric cochlear implantation."

Limitations included the 2-year follow-up period, and that a randomized trial was not possible, as "everybody was implanting these children whenever they could," said Oghalai.

Michal Ruprecht is a medical student based in Michigan. He is a former reporting intern for MedPage Today. Follow

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Disclosures

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