Epidemiological Factors Influencing Access to Cochlear Implantation and Language Skills of Deaf and Hard-of-Hearing Children

Edward C. Wu, MD, MBA; Hossein Mahboubi, MD, MPH; Shawn Zardouz, MD; Yuk-Yee Amy Yau, MD; Vanessa S. Rothholtz, MD, MSc; Hamid R. Djalilian, MD

Department of Otolaryngology – Head and Neck Surgery, University of California, Irvine (Orange, CA)

INTRODUCTION

- In the United States, the average incidence of neonatal hearing loss is 1.1 per 1000 infants,1 with up to a twentyfold risk among infants in the neonatal intensive care unit.2
- The universal neonatal hearing screening (UNHS) was introduced in the early 1990s and has since been mandated in 39 states.3,4 UNHS has shown to improve long-term language outcomes at school age than those who were not screened.
- Nevertheless, ensuring appropriate follow-up upon identification of hearing loss through UNHS and even more so without it, has been a persistent issue.4,5 For instance, in 2008, 3.6% of infants needing further work-up were lost to follow up.7 Cochlear implants (CI) are one of the options for deaf or hard-of-hearing (DHH) children.
- We designed a survey study to determine the relationships between family demographics and educational resources with parental knowledge of and willingness for their children to receive cochlear implantation (CI) and deaf and hard-of-hearing (DHH) children’s language skills. Findings from this study may elucidate both correctable factors that prejudice parents of DHH children from receiving early audiological intervention for their children.

RESULTS

- Sixty-six surveys were included in the analysis. Sixty-six parents had already undergone CI. Of those children without CI, 62% had been presented with the option of CI by a healthcare professional and 24% were willing to have their child undergo CI. Willingness for children to undergo CI was statistically higher in families with at least one normal hearing parent (p<0.04), annual income less than $15,000 or more than $75,000 (p<0.01), and children enrolled in specialized schools for DHH (p<0.01). Risks of surgery (17%) and negative feedback from others (14%) were the leading reasons for unwillingness to undergo CI. Number of spoken words was greater among DHH children who attended public schools or who were enrolled in more than one form of curriculum. These results are in alignment with those of Moog et al., who found that the probability that a child would reach normal language levels by kindergarten increased significantly if, at age 1 year, intervention included a combination of cochlear implant use and parent-child intervention and, at age 2 years, a listening and spoken language class with other deaf children was added.10 The common ground appears to be early interaction with peers in the context of a language-intensive instructional curriculum.

- One limitation is that UNHS was implemented in California in 2006, while the current study had only two children born after 2006. Therefore, more of our population may have missed UNHS.

CONCLUSIONS

- A significant gap exists between the number of CI candidates and families aware of the option. Sixty-two percent knew about CIs and 24% were willing their child to have them.
- Most common causes for not having CI were risk of surgery and negative feedback from other.
- Almost half of cases were educated about CIs through audologists.
- Willingness for CI was higher in families with <$15,000 or ≥$75,000 annual income, children attending schools for DHH children, and parents with at least one normal hearing ear. No factor was associated with knowledge of CIs.
- On average, DHH children in public schools enrolled in a mainstream curriculum appear to have better language skills.

REFERENCES