Long-term Use of Cochlear Implants in Older Adults: Results from a Large Consecutive Case Series

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INTRODUCTION

- A cochlear implant (CI) is a surgically-implanted neuroprosthetic device that allows for access to sound for individuals with severe-to-profound sensorineural hearing loss.
- The number of older adults in the US that may benefit from CI is approximately 150,000, and it will only increase with the current trend of population aging. Previous studies have shown that older adults consistently demonstrate improved speech perception abilities after CI in the clinical setting.
- However, whether older adults continue to utilize CI over the long term is still unknown.

STUDY AIMS

- To investigate rates of long-term use of cochlear implants in older adults (≥ 60 years) implanted at Johns Hopkins.
- To identify characteristics associated with continued CI use.

METHODS

- **Study Design**
  - Consecutive case series
- **Study Cohort**
  - 447 individuals who received their first CI at ≥60 years at Johns Hopkins from 1999-2011.
- **Data Collection**
  - Successfully contacted 397 (89%) individuals via email, phone, and postal survey.
  - Ascertained data on the individual’s daily CI use averaged over the past 4 weeks.
  - Regular CI use was defined as ≥ 8 hours per day.
- **Data Analysis**
  - Fisher’s exact test and 2-sample t-test to compare the characteristics of regular users and non-users.
  - Kaplan-Meier analysis to investigate the time from CI to the date when an individual used a CI <8 hours per day.
  - Log-rank test and Cox proportional hazard model to examine an association between the rates of regular CI use and age at implantation.

RESULTS

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<th>RESULT #1: Rates of regular CI use in older adults at &gt;10 years of follow-up exceed 80%</th>
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<td>Time from date of CI implantation to reporting non-use of CI (&lt;8hrs/day) in all patients. The overall rate of regular CI use at 13.5 years of follow-up was 82.6% [95% CI: 72.5-89.3%].</td>
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<th>RESULT #2: Earlier age at implantation is associated with greater rate of regular CI use.</th>
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<td>At 13.5 years of follow-up, individuals who received a CI at 60-74 years had significantly higher rates of regular CI use (91.1%, [95% CI: 83.2-95.4%]) than individuals who received a CI at ≥75 years (55.7%, [95% CI: 24.9-78.1%]).</td>
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<th>RESULT #3: Reasons for using a CI &lt;8 hours/day among non-users (n=31 patients).</th>
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LIMITATIONS

- Retrospective study - Recall bias
- Single-center study
- Lead time bias

CONCLUSIONS

- Long-term rates of regular CI use remain high in older adults.
- The risk of discontinuing regular CI use is strongly associated with greater age at implantation.
- Common reasons for non-use include poor hearing benefit, pain or discomfort, and no need to hear.

IMPLICATIONS

- The earlier implantation of older adults may be associated with better outcomes.
- Strategies promoting earlier rather than later implantation may be warranted.

REFERENCES