Outcomes of Cochlear Implantation in Pediatric Patients with Asymmetric Hearing Loss

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Almost there...
Disclosures

• None
What We Know About AHL

- Understanding in noise
- Localization of sounds
- Academic difficulties
- Social difficulties
- Behavioral difficulties

Cadieux et. al (2013); Firzst et. al (2012); Cho Lieu et. al (2004); Culbertson et. al (1986); Bess et. al (1984).
Current FDA Criteria for Cochlear Implantation

Candidate

Not a Candidate
Our Project

• Retrospective chart review

• Of 706 patients implanted since 1995, 13 children with asymmetric hearing loss were identified
  • Implanted between 1999-2015
  • 7 of 13 subjects had speech testing using same measures
Subjects

- Average age at surgery = 8 years (range: 1-17 years)
- Average duration of deafness = 40 months (range: 1-96 months)
- Most common etiology was EVA

**Etiology of Hearing Losses**

- EVA: 54%
- CMV: 23%
- Other (connexin, Noonan, Meningitis): 15%
- Unknown: 8%

**Duration of Deafness Prior to CI**

- Average age at surgery = 8 years (range: 1-17 years)
- Average duration of deafness = 40 months (range: 1-96 months)
- Most common etiology was EVA
Subjects

Non-implanted/Better-Ear Hearing Thresholds
Compliance Results

All subjects

1 subject

1 subject
Post-operative Performance Testing

<table>
<thead>
<tr>
<th>Subject (Test)</th>
<th>HA only</th>
<th>CI only</th>
<th>HA + CI</th>
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<td>20</td>
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<td>13 CNC</td>
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<td>10 W-22</td>
<td>70</td>
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<td>3 NU-6</td>
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Post-operative Performance Testing

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Percent Correct
Post-operative Performance Testing

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<td>3 NU-6</td>
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- HA only
- CI only
- HA + CI
Post-operative Performance Testing
Bimodal Benefit

Percentage Point Improvement with Addition of Cl

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Comparing to the Literature…

✓ All subjects showed improvement bimodally in quiet (Firzst et al., 2012, Cadieux et al., 2013)

✓ Majority of subjects wear their CI full-time (Sadadcharam et al., 2016, Mertens et al., 2015)
Adult abilities in noise improved following CI, but only after a longer period of time (Mertens et al., 2015)
Limitations

- Small and heterogeneous sample
- Limited pre-operative speech testing due to age
- Not all data accessible in medical records
- Variety of speech tests used across and within subjects
Moving Forward

• Include more challenging/real-world testing in clinic protocols (*think beyond just word recognition*)

• Consider earlier implantation for these asymmetric hearing loss patients

• Using a larger dataset identify:
  – patient factors that may predict use/non-use
  – specific challenges faced in this population
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Thank You!
References