Rehabilitation Barriers for Rural Pediatric Cochlear Implant Recipients

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Disclosures

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Rural Hearing Healthcare Disparities

• Timing of cochlear implantation is intimately associated with language development outcomes.

• Rural children are frequently delayed in diagnosis of hearing loss as well as amplification and subsequent implantation (Bush 2014)

• Characterization of post-implantation rehabilitation timing and barriers in rural children is unknown
Factors related to post-CI outcomes

Multiple factors affect post-CI rehabilitation

– Socioeconomic status
– Family environment
– Enrollment in speech therapy
– Participation with audiology
– Attendance in mainstream school

(Holt 2014, Yanbay 2014)
The purpose of this study is to assess and compare barriers of post-implantation rehabilitation care for urban and rural pediatric CI recipients.
Methods

• Semi-structured interviews with parents of children with cochlear implants (N=35)

• Assessed demographic information, subjective barriers in rehabilitation, educational pathway, compliance with CI use, speech therapy timing, performance with CI - Parents’ Evaluation of Aural/Oral Performance of Children (PEACH)
Results

• 22 rural residents, 13 urban residents
• No difference in educational levels, mean income, and insurance type in this group
Challenges in Travel

Travel distance was significantly greater for rural participants (on average 56 minutes longer than urban participants) (p=0.46)
Speech Therapy Disparity

Timing of Initiation of Speech Therapy Services

Percentage of Participants

At the time of identification of hearing loss: 0.04
After obtaining hearing aids: 0.63
After cochlear implantation: 0.76
Preschool: 0.24
Age 4-5: 0.74
After age 5: 0.24

Timing of Initiation of Speech Therapy

Urban
- At the time of identification of hearing loss: 42%
- After obtaining hearing aids: 33%
- After cochlear implantation: 17%
- Preschool: 0%
- Age 4-5: 8%
- After age 5: 0%

Rural
- At the time of identification of hearing loss: 11%
- After obtaining hearing aids: 42%
- After cochlear implantation: 21%
- Preschool: 11%
- Age 4-5: 5%
- After age 5: 11%
Educational Differences

### Educational Factors

<table>
<thead>
<tr>
<th>Percentage of Participants</th>
<th>Educational Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urban</strong></td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Rural</strong></td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Attendance at Deaf School</strong></td>
<td>7%</td>
</tr>
<tr>
<td><strong>Held Back a Grade</strong></td>
<td>73%</td>
</tr>
<tr>
<td><strong>Urban</strong></td>
<td>29%</td>
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<tr>
<td><strong>Rural</strong></td>
<td>33%</td>
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</table>
Correlation with Difficulty and Outcomes

Difficulty index based on insurance, distance, access, child’s attitude toward the implant

PEACH Score versus Difficulty Index

\[ r = -0.411 \]
\[ p = 0.02 \]
Limitations

1. Small sample size
2. Cohort is not age-matched, thus comparison of speech outcomes is not feasible
3. No objective assessment of quality of rehabilitation services
Conclusions

1. Rural CI recipients face barriers to access to care
2. Rural school-based speech services is limited and assessment of educational progress may be inadequate
3. Initiation of rural speech services may be delayed
4. Difficulty in access affects outcomes
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Questions?

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