Cognitive and quality of life benefits from cochlear implantation in the elderly

MH SONNET, JY NIEMIER, B MONTAUT-VERIENT, C. PARIETTI-WINKLER

ENT Department, University Hospital of Nancy, Nancy, France
Geriatric Department, University Hospital of Nancy, Nancy, France
EA 3450 DevAH, University of Lorraine, France
Disclosure of interest

No direct participation by industries
Only invitation to the congress by Oticon Medical
Introduction

Cochlear Implantation in the Elderly

- Cognitive impairment linked to auditory loss
- Question: Cognitive function linked to cochlear implantation ?

Objectives

- Evaluation of quality of life, cognitive function and mood troubles in relationship with auditory improvement
- in elderly patients with cochlear implant
- using geriatric validated scales
Methods

Study Design
Prospective observational study
Start 2014 ➔ still undergoing
Tertiary referral center for cochlear implantation and geriatric center in Nancy, France

Inclusion Criteria
Elderly patients ≥ 65 y.o.
Candidates for Cochlear Implantation (post-lingual severe to profound SHL)

Exclusion Criteria
Severe cognitive impairment
Severe medical problems
Methods

Evaluations Criteria

- Pre-CI, 6 months and 12 months post-CI
- Speech Audiometry: monosyllabic word recognition in quiet
- Quality of life: WHOQOL-OLD (World Health Organization Quality of Life Assessment for elderly people)
  Scale validated in French
- Cognitive function: Mini-Mental State Examination, Executive function: Rey’s complex figure and TMT A.
- Depression: Hamilton Scale,

1 A. Leplège, C. Perret-Guillaume et al. 2012
Population Demographics

N=14  (9 males, 5 females), 65 to 79 years (mean age 72.5 y +/- 4.8).

Profound hearing loss
Cause of deafness: progressive SNHL attributed to aging
(11 patients, + 1 Meniere's, 1 ototoxicity and 1 temporal bone fracture).

Deafness duration: 18.2 years (+/- 13.1)

Use of contralateral Hearing Aid : 8 patients

Level of education:  -  4 Low: no diplomas,
                    -  7 Medium: professional certificates,
                    -  3 High: Bachelor or College degree.

Cochlear Implants: mostly placed on left ear (9 pat. 64 %) and 3 brands represented:
mostly Oticon Medical (9 pat.), Medel (3 pat.) and Cochlear (2 pat.)
**Results: Effect on Speech Perception**

= Successful recovery of speech perception after 6 months

Intelligibility of monosyllabic words in quiet at 60 dB

Average scores:

- **10.1 % +/- 15** before CI
- **60.8 % +/- 24** 6 months after CI
- **71.3 % +/- 20** 12 months after CI

All differences with pre-CI significant.
No statistically signif. difference between 6 and 12m.
Results: Effect on QoL

Quality of Life: WHOQOL-OLD

No significant impact on QoL measures

General scale validated in French, non specific of auditory loss

2 different scales were used – z-scores

No statistically signif. difference between 6 and 12m.
Results: Effect on Depression

Hamilton Depression Scale

No significant group difference

Trend to diminishing values

1 patient with high values before CI (25), decreased to mild (4)
Results: Effect on Cognition

COGNITION: MMSE (Mini-Mental State Evaluation)

Realized by neuropsychologist

Global stability

---

The Mini-Mental State Exam

<table>
<thead>
<tr>
<th>Maximum</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>()</td>
</tr>
<tr>
<td>5</td>
<td>()</td>
</tr>
<tr>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>()</td>
</tr>
<tr>
<td>Attention and Calculation</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>()</td>
</tr>
<tr>
<td>Recall</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>()</td>
</tr>
<tr>
<td>Language</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>()</td>
</tr>
<tr>
<td>1</td>
<td>()</td>
</tr>
<tr>
<td>3</td>
<td>()</td>
</tr>
<tr>
<td>1</td>
<td>()</td>
</tr>
<tr>
<td>1</td>
<td>()</td>
</tr>
</tbody>
</table>

N = 12
N = 12
N = 7

Pre CI Post 6 Post 12
Results: Effect on Executive Functions

Rey Complex figure test

Visuo-spatial organisation and planning

Significant improvement post-CI

Significant increase between pre-CI and 6 m post-CI.
Results: Effect on Executive Functions

Trail Making Test A

Visuo-spatial sequential organization and inhibition

Tendency to decrease between pre-CI and 6 m post-CI.

Non significant time reduction (-10 s)
Discussion - Conclusions

CI outcomes in elderly
  Successful in speech perception
  Use of implant all day

Quality of Life
  Non conclusive QoL measures for the moment
  Small effect on depression measures
  More patients needed

Cognitive Functions
  Stability in global measures
  Increase of executive functions (Rey’s figure test and TMT A)
MH SONNET, JY NIEMIER, B MONTAUT-VERIENT, C. PARIEtti-WINKLER

ENT Department, University Hospital of Nancy, Nancy, France
Geriatric Department, University Hospital of Nancy, Nancy, France