Relationship between subjective hearing and memory complaints in late middle-aged adults at risk for Alzheimer’s disease

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BACKGROUND

Subjective memory impairment may be one of the earliest indications of subsequent cognitive decline in adults who later develop dementia. Longitudinal studies have shown subjective memory complaints (SMCs) are predictive of cognitive decline and dementia. SMCs have been associated with biomarkers of Alzheimer’s disease (AD), even in the absence of objective cognitive impairments. Auditory dysfunction is also a risk factor for cognitive decline and dementia, but whether it is associated with SMCs has never been investigated.

OBJECTIVE

In a late middle-aged cohort at risk for AD, determine whether subjective hearing complaints are associated with:
1. Subjective memory complaint
2. Different domains of subjective memory function

METHODS

Patients:
- N=192 cognitively healthy adults, enriched for parental history of AD and APOE e4 genotype, from the Wisconsin Registry for Alzheimer’s Prevention (see Table 1)

Subjective Hearing Complaints
- Average of responses to 4 questionnaire items assessing subjective perception of overall hearing problems, listening effort, sound clarity, and spatial hearing ability on a ten-point scale

Subjective Memory Complaint (SMC)
- Single question: “Do you think you have a problem with your memory?”

Domains of Subjective Memory Function
- 54 items from the Memory Functioning Questionnaire (MFQ), which includes questions pertaining to four domains:
  - Frequency of forgetting (e.g., How often do names present a problem for you?)
  - Seriousness of forgetting (i.e., When you actually forget in these situations, how serious of a problem do you consider the memory failure to be?)
  - Retroactive functioning (e.g., How is your memory compared to the way it was one year ago?)
  - Mnemonics usage (e.g., How often do you make lists of things to do to remind yourself about things?)

Participants rate responses on a seven-point scale

Statistical Analyses
- Binary logistic regression used to estimate odds of SMC
- N=39 participants who responded “I don’t know” excluded for this analysis only
- Subjective hearing complaints treated as continuous in analysis but displayed in quartiles (Figure 1) for clarity
- Separate linear regressions used to assess relationship between subjective memory complaints and each MFQ domain
- All regressions adjusted for age, sex, education, and subjective health rating

RESULTS

Table 1. Participant characteristics.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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<tbody>
<tr>
<td>Age, y, mean (SD)</td>
<td>64.2 (6.74)</td>
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<tr>
<td>Female, %</td>
<td>72.4</td>
</tr>
<tr>
<td>Education, y, mean (SD)</td>
<td>35.95 (2.72)</td>
</tr>
<tr>
<td>Family History Positive, %</td>
<td>70.8</td>
</tr>
<tr>
<td>APOE4 Carriers, %</td>
<td>37.5</td>
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</tbody>
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Table 2. Greater odds of subjective memory complaint with increasing levels of subjective hearing complaints.

<table>
<thead>
<tr>
<th>OR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.11 [1.03-1.19]</td>
</tr>
<tr>
<td>Female</td>
<td>1.12 [0.52-2.80]</td>
</tr>
<tr>
<td>Education</td>
<td>1.02 [0.88-1.18]</td>
</tr>
<tr>
<td>Subjective overall health rating (1-5)</td>
<td>83.3 [37.1-10]</td>
</tr>
<tr>
<td>Subjective hearing complaints (1-10)</td>
<td>1.54 [1.21-1.93]</td>
</tr>
</tbody>
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Figure 2. Subjective hearing complaints are associated with multiple domains of subjective memory function.

DISCUSSION

- Increasing levels of subjective hearing complaints were associated with greater odds of SMC (p<.001, Figure 1)
- Subjective hearing complaints were associated with all four domains of subjective memory function assessed by the MFQ (all p<.05, Figure 2)
  - Strong association with “Frequency of Forgetting” (p<.001, Figure 2a) – accounts for greatest variance in self-rated memory and is one of the most frequently studied aspects of memory self-appraisal
  - Strong association with “Seriousness of Forgetting” (p<.001, Figure 2b) – reflects anxiety about memory
  - Strong association with “Retroactive Function” (p<.001, Figure 2c) – reflects perceived declines in memory; tends to increase with increasing age and is correlated with neurocognition
  - Moderate association with mnemonics usage (p<.01, Figure 2d) – reflects proactive prevention of memory failures; also tends to increase with increasing age
- Would be interesting to investigate how mood and personality factors (e.g., neuroticism, depression) may effect these relationships in future analyses

REFERENCES


ACKNOWLEDGMENTS

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