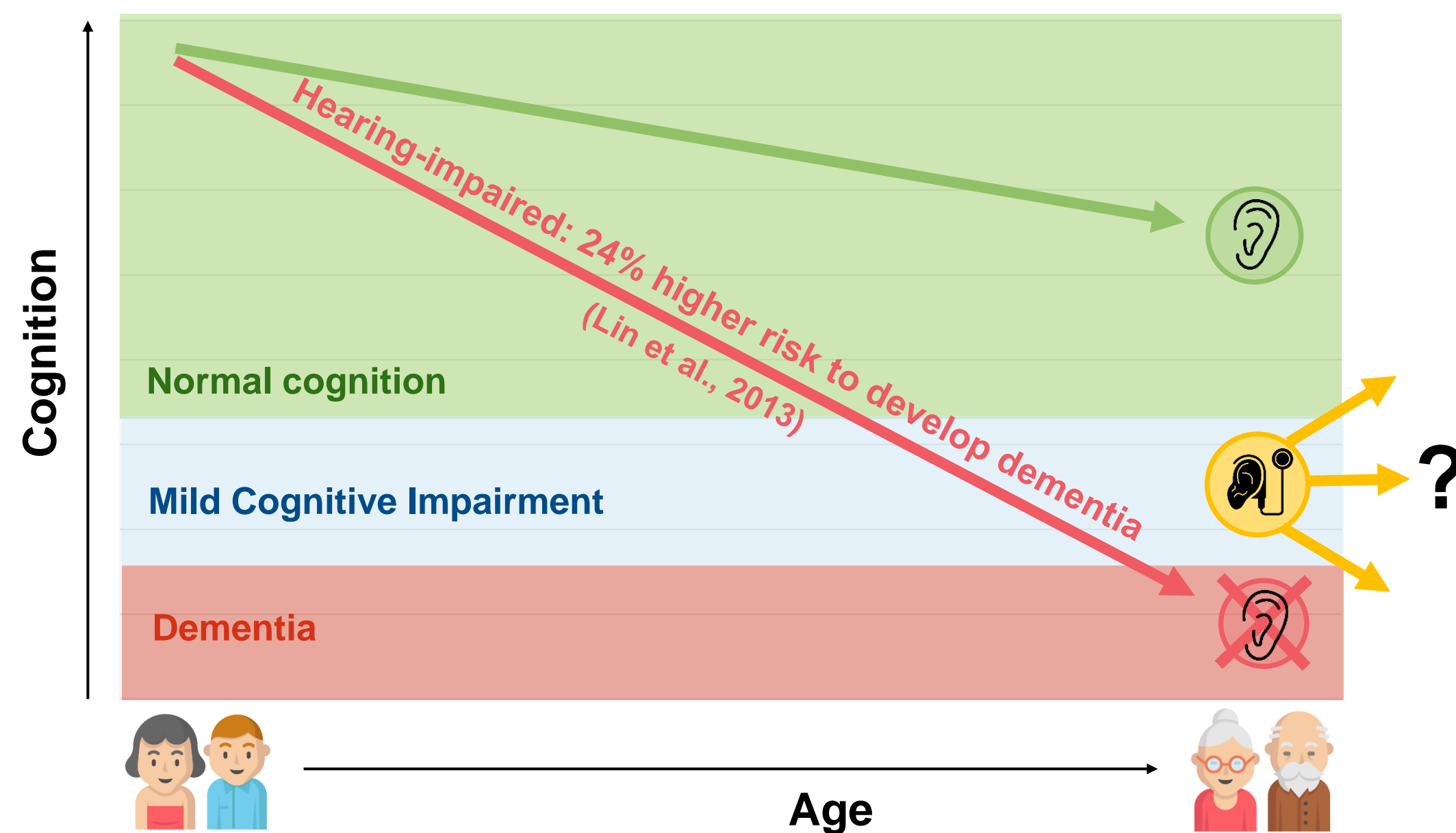


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Background

Given the rapidly rising dementia incidence, management of modifiable risk factors such as hearing loss is vital (World Health Organization, 2019; Livingston et al., 2020). Multiple studies have demonstrated an improvement of cognitive functioning in severely hearing-impaired older adults after cochlear implantation (Mertens et al., 2020; Mosnier et al. 2018; Völter et al. 2022). However, few of these studies specifically analyzed participants achieving poor cognitive results preoperatively.



Mild cognitive impairment (MCI) is an intermediate state between age-related forgetfulness and dementia. People with MCI can still autonomously perform their activities of daily life, whereas people with dementia cannot. However, within 5 years, more than half of all MCI-cases progress to a dementia syndrome (Bruscoli et al., 2004).

Objective

To study the evolution of cognitive functioning in severely hearing-impaired older adults at risk for mild cognitive impairment (MCI) after cochlear implantation.

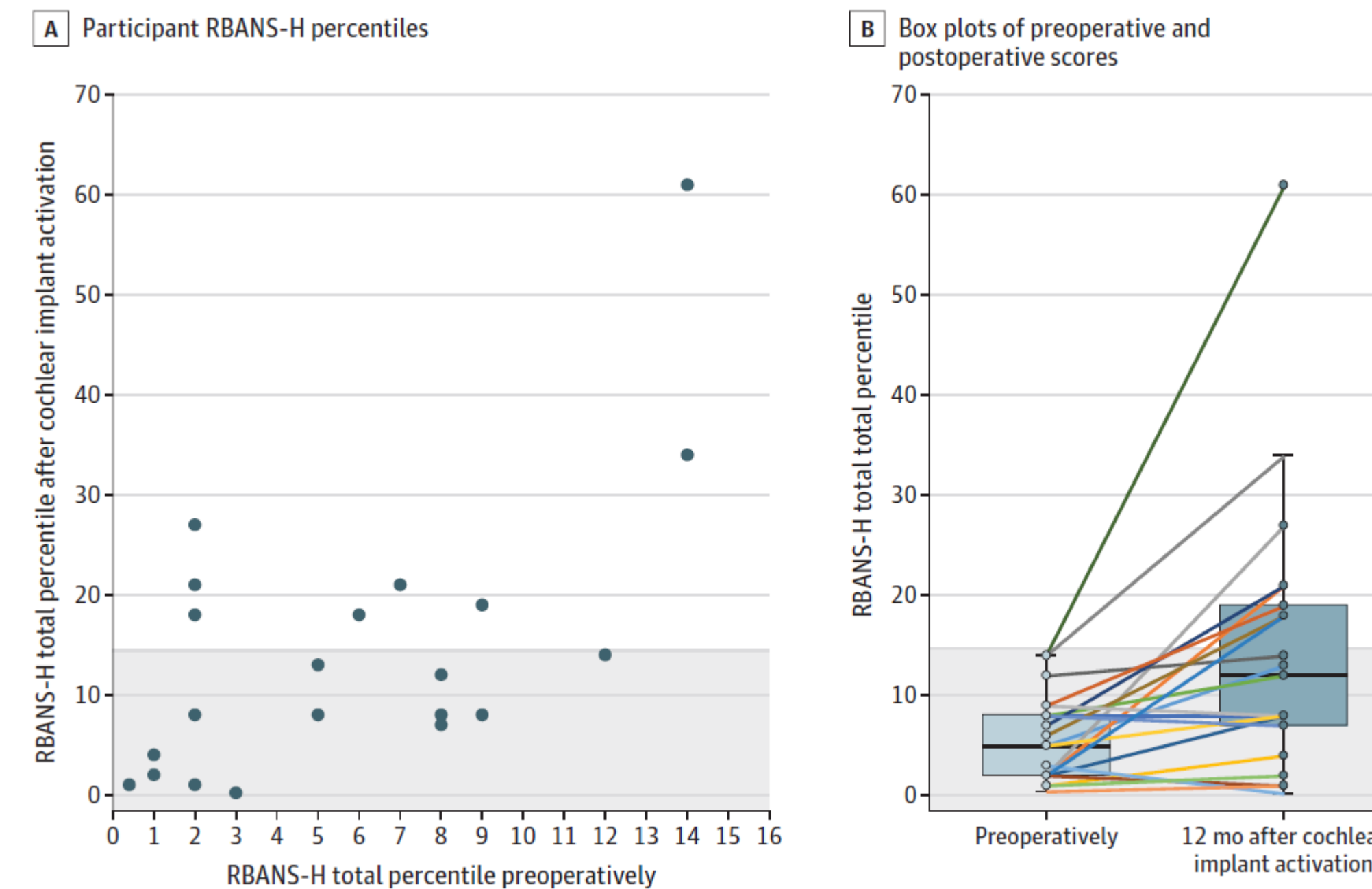
Methods

This **prospective, longitudinal cohort study** reports data obtained over a six-year period (April 2015 – September 2021) of an ongoing prospective, longitudinal cohort study on CI outcomes in older adults at the Antwerp University Hospital, Belgium,

A **consecutive sample of severely hearing-impaired older adults** eligible for cochlear implantation were included. All participants obtained a Repeatable Battery for the Assessment of Neuropsychological Status for Hearing-impaired patients (RBANS-H) total score indicative of **MCI preoperatively**. Participants were **assessed before and 12 months after CI activation**.

Results

A total of 21 older adult CI candidates were included in the analysis (mean [SD] age: 72 [9] years; 13 [62%] men).



Cochlear implantation resulted in an **improvement of overall cognitive functioning 12 months after activation** (median [IQR] percentile, 5 [2;8] vs 12 [7;19]; difference [95% CI], 7 [2;12]).

Eight participants (38%) surpassed the MCI cut-off (16th percentile) postoperatively, while the overall median cognitive score remained under this cut-off.

Participants' **speech recognition in noise improved** (mean [SD] score, +17.16 [5.45] vs +5.67 [6.3]; difference [95% CI], -11.49 [-14.26;-8.72]) after CI activation. **Improvement of speech recognition in noise was positively related to improvement in cognitive functioning** (r_s [95% CI], -0.48 [-0.69;-0.19]). Years of education, sex, RBANS-H version and symptoms of depression and anxiety were not related to the evolution in RBANS-H scores.

Conclusion

Cognitive functioning and speech perception in noise showed a clinically meaningful improvement 12 months after CI activation in severely hearing-impaired older adults at risk for MCI. Hence, **cochlear implantation is not contraindicated in CI candidates with cognitive decline** and should be considered after multidisciplinary evaluation.

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