

# Quo Vadis, presbycusis, cognitive impairment and dementia

## Quo Vadis, presbiacusia, deterioro cognitivo y demencia

Paul Delano R.<sup>1</sup>

<sup>1</sup>Editor, Revista Otorrinolaringología y Cirugía de Cabeza y Cuello. Hospital Clínico Universidad de Chile. Santiago, Chile.

Correspondencia:  
Avenida Dr. Carlos Lorca Tobar 999, Independencia, Hospital Clínico Universidad de Chile. Santiago, Chile.  
Email: pdelano@hcuch.cl

In 2017, the Alzheimer's Association published a model in the *Lancet* journal that included hearing loss as one of the modifiable risk factors to prevent cognitive decline associated with aging and dementia<sup>1</sup>. This model was based on evidence from longitudinal cohorts that linked hearing loss with dementia<sup>1,2</sup>. Since then, multiple studies have been carried out worldwide to understand the mechanisms of this epidemiological association, with a significant focus on the diagnosis of hearing loss and the prevention of cognitive decline<sup>3,4</sup>.

The current model to prevent dementia, promoted by the Alzheimer's Association, includes 14 preventable risk factors: education, hearing loss, LDL cholesterol, depression, brain trauma, physical inactivity, diabetes, smoking, high blood pressure, obesity, excessive alcohol consumption, social isolation, air pollution, and vision loss. These preventable factors account for 45% of the total risk of developing dementia, with hearing loss, at 7%, being one of the most significant factors in the model<sup>4</sup>.

This raises the question of whether treating hearing loss with hearing aids could slow the progression of cognitive decline and dementia. This problem was the primary aim of the ACHIEVE project<sup>5</sup> (ClinicalTrials.gov, NCT03243422), a multicenter clinical trial comparing the effects of using hearing aids versus education for preventing cognitive decline and dementia in patients with hearing loss. The results of this study show that after three years, there were non-significant differences in cognitive performance between the control group (education only) and the intervention group (hearing aids). However, when analyzing subgroups by the severity of the cognitive

risk, hearing aid intervention had a significant impact on cognitive tests in the high-risk group but not in the low-risk group<sup>5</sup>.

The results of the ACHIEVE study should be interpreted with caution for several reasons. The study only had a three-year intervention period, and it is highly likely that significant effects on cognitive tests would only become evident with longer follow-up periods. It is also important to note that the control factor used in the ACHIEVE study was healthy aging education. This intervention strongly benefits patients, making it challenging for a unimodal intervention (hearing aid use) to demonstrate a greater effect. Therefore, the question of the utility of hearing aids in improving cognitive performance in patients with hearing loss remains open and should be addressed with multimodal interventions that include other risk factors for cognitive decline. Moreover, the negative results of the ACHIEVE study relate only to the cognitive domain of hearing aid use and should not eclipse the audiological arguments and improvements in oral communication, which in themselves justify recommending hearing aids for individuals with hearing loss and communication difficulties.

Finally, it is essential to highlight that the epidemiological association between hearing loss and cognitive decline has fostered basic and clinical research, as well as collaboration among clinical teams from disciplines such as otolaryngology, neurology, psychiatry, geriatrics, and audiology, among others. This research and multidisciplinary work have benefited patients with presbycusis, promoting a comprehensive, multidimensional, and evidence-based approach.

## References

1. Livingston G, Sommerlad A, Orgeta V, et al. Dementia prevention, intervention, and care. *Lancet*. 2017;390(10113):2673-2734. doi: 10.1016/S0140-6736(17)31363-6
2. Délano PH. Hipoacusia: Un nuevo factor de riesgo para demencia. *Rev Otorrinolaringol Cir Cabeza Cuello*. 2017;77(3):237-238. doi: 10.4067/s0718-48162017000300237.
3. Wimmer del Solar J, Delgado C, Torrente MC, Délano PH. Hipoacusia como factor de riesgo para demencia. *Rev Med Chile*. 2020;148(8):1128-1138. doi: 10.4067/S0034-98872020000801128.
4. Livingston G, Huntley J, Liu KY, et al. Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission. *Lancet*. 2024;404(10452):572-628. doi: 10.1016/S0140-6736(24)01296-0
5. Lin FR, Pike JR, Albert MS, et al. Hearing intervention versus health education control to reduce cognitive decline in older adults with hearing loss in the USA (ACHIEVE): a multicentre, randomised controlled trial. *Lancet*. 2023;402(10404):786-797. doi: 10.1016/S0140-6736(23)01406-X