

Older adults fitted with cochlear implants exhibit poor brain function

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Older adults fitted with a cochlear implant to compensate for severe hearing loss have significantly poorer cognitive function than their normal-hearing counterparts, reveals a new study. Hearing loss is a risk

factor for cognitive decline and dementia, so this new finding suggests cochlear implants cannot fully compensate for this deterioration in brain function. Publishing in *Frontiers in Neuroscience*, the study authors suggest that rehabilitation should be adjusted to the cognitive profile of the cochlear implant patient. Moreover, further long-term studies are vital for determining the impact of cochlear implants on cognition and its decline.

"Even when we took differences such as age, sex and education level into account, elderly adults fitted with a [cochlear](#) implant performed significantly lower in a cognitive function test than those with normal [hearing](#)," says Dr. Annes Claes, who carried out this research at the Department of Otorhinolaryngology, Antwerp University Hospital, Belgium.

Professor Griet Mertens, who coordinates the cognitive hearing project at the Antwerp University Hospital continues, "Cochlear implants may have a positive effect on the cognitive functions of these patients. Nevertheless, our results point out that cochlear implant recipients do not align with their normal-hearing peers in the longer-term after cochlear implantation."

Hearing loss is a risk factor for accelerated cognitive decline and dementia in older adults. As age-related hearing loss is very common in the aging population, it means a lot of older people are at risk of brain-function decline. Moreover, the more severe the hearing loss, the higher the risk for dementia. This has stimulated research into whether treating hearing loss by means of hearing aids or cochlear implants could improve cognition in older adults.

"The economic and social burden of dementia is enormous and there is currently no cure," explains Professor Dr. Paul Van de Heyning, co-author, also based at Antwerp University Hospital. "The first studies

with cochlear implants were promising, indicating an increase in cognition after implantation. However, long-term conclusive information about cochlear implant effects are not yet available, simply because it takes many years to collect these data."

In the current absence of long-term data, Claes and her colleagues devised a study to examine whether severely hearing-impaired individuals fitted with a cochlear implant had age-expected cognitive function. To do this, they compared cochlear implant recipients over the age of 55, who had one or up to eighteen years of experience with the device, to a group of normal-hearing similar-aged adults using a specialized cognitive function test.

Claes explains, "If we used a regular cognitive test, the hearing-impaired individuals would have been at a disadvantage. We developed the RBANS-H test, which provides both auditory and visual information to the recipient, instead of just an auditory presentation."

Their findings from this comparison were quite clear, showing a large difference in the cognitive function of each group. Even after taking differences such as age, sex and education level into account, the elderly [adults](#) fitted with cochlear implants performed significantly lower in the cognitive function test.

"More studies are needed to ultimately assess in which way [cochlear implants](#) influence the natural [cognitive decline](#). We have some preliminary results from a collaborative multi-center study showing there is a cognitive improvement after [cochlear implantation](#) but no normalization. This is in line with our current findings that imply a cochlear implant is not able to keep the [older adults](#) with a severe [hearing loss](#) at an age-expected level of cognition or to completely restore the level of cognition," says Mertens.

She concludes, "Additional rehabilitation in the long-term after implantation, tailored to the cognitive profile of individuals, may be appropriate for cochlear [implant](#) patients."

More information: Annes J. Claes et al, Impaired Cognitive Functioning in Cochlear Implant Recipients Over the Age of 55 Years: A Cross-Sectional Study Using the Repeatable Battery for the Assessment of Neuropsychological Status for Hearing-Impaired Individuals (RBANS-H), *Frontiers in Neuroscience* (2018). [DOI: 10.3389/fnins.2018.00580](#)

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