Research Briefing

Research Briefing prepared by Brian Lamb. If you have any suggestions for papers or research for future research summaries, please let me know at (brian@ciicanet.org). 16.05.25

Moura JE, Martins JH, Alves M, Oliveira G, Ramos D, Alves H, Caiado R, Teixeira A, Silva LF, Migueis J. Children then, adults now: long-term outcomes-performance at 15, 20, and 25 years of cochlear implant use. Front Rehabil Sci. 2023 Dec 14;4:1275808. doi: 10.3389/fresc.2023.1275808. PMID: 38170021; PMCID: PMC10760633.

The study examines three decades of rehabilitation through CIs in the patients of a CI centre in Portugal, of patients implanted in the initial phase of the cochlear implantation program. The study evaluated the performance of individuals with severe to profound congenital hearing loss who underwent paediatric cochlear implantation and have used the cochlear implant for at least 25 years, to assess what the beneficial effect was of early intervention in improving performance results.

The study was composed of 31 individuals with severe to profound congenital hearing loss and no other comorbidities, divided into two groups (Group 1: age at implantation was under 3 years; Group 2: age at implantation was over 3 years). All 31 were evaluated at 15, 20, and 25 years of cochlear implant (CI). The results of both groups were compared to find out if there is an effect of age at implantation on auditory performance, and if there is an improvement in the performance with CI over time (15, 20, and 25 years of use).

The researchers found that “that there is a positive effect, with statistical significance, of early implantation on auditory performance, and telephone use. In both groups, there is an increase in performance over time, but it tends to stabilize after 20 years of CI use.”

These results support the “importance of early intervention in patients with severe to profound hearing loss who are cochlear implant users and show that CI is an effective and reliable method in the treatment of these patients, contributing to their improved socio-educational integration, and that the benefits last over time.”

Implications for Advocacy

This study adds to many others which have shown the importance of early intervention and implantation to secure the optimal benefits from CI and shows there is early implantation improves auditory performance and that this supports educational and social integration and performance over time. As with other studies this would suggest that early screening for childhood hearing loss is crucial as is access to support and advice for parents wishing to take this route.

Marx, M., Mounié, M., Mosnier, I. *et al.* Cost-utility of cochlear implantation in single-sided deafness and asymmetric hearing loss: results of a randomized controlled trial. *Eur J Health Econ* (2024). https://doi.org/10.1007/s10198-024-01740-9

The authors wanted to determine the Incremental Cost-Utility Ratio (ICUR) of cochlear implantation in the treatment of adult patients with single-sided deafness (SSD) and asymmetric hearing loss (AHL). This prospective multicentre pragmatic study including a randomized controlled trial (RCT) enrolled 155 subjects with SSD or AHL. Participants chose a treatment option between: abstention, Contralateral Routing of the Signal from hearing aids, Bone Conduction Device or Cochlear Implant (CI). Participants who opted for CI were then randomized between two arms: "immediate CI" where the cochlear implantation was performed within one month and "initial observation" where subjects were first observed. The ICUR of CI was determined at 6 months follow-up by comparing the two arms. Utility was measured using EuroQoL- 5 dimensions (EQ-5D), to calculate the gain in Quality-Adjusted Life Years (QALY). Individual costs were extracted from the French National Health Insurance database.

Among the 155 included participants, 51 opted for a CI and were randomized. For a 6 months follow-up period, the ICUR was €422,279/QALY gained after CI. Using the MMS model, the ICUR of CI decreased to €57,561/QALY at 10 years follow-up, €38,006/QALY at 20 years, and dropped to €26,715 at 50 years. In the participants with severe tinnitus, mean ICUR was €31,105/QALY at 10 years.

They concluded that CI can be considered as an "efficient treatment in SSD and AHL from 20 years follow-up in the global population, and before 10 years follow-up in patients with severe associated tinnitus."

Implications for Advocacy

There have been questions about the cost effectiveness of CI's for single sided deafness. This study shows that if longer term usage of the CI is accounted for then the Cis can be considered as an efficient treatment depending on continued usage of 20 years or 10 years if the person has tinnitus. This may help advocates who wish to show that in cost effectiveness terms people with single sided deafness should have access to CIs.

Ruan-Ching Yu, Menelaos Pavlou, Anne G M Schilder, Doris-Eva Bamiou, Glyn Lewis, Frank Robert Lin, Gill Livingston, Danielle Proctor, Rumana Omar, Sergi G Costafreda, Early detection and management of hearing loss to reduce dementia risk in older adults with mild cognitive impairment: findings from the treating auditory impairment and cognition trial (TACT), *Age and Ageing*, Volume 54, Issue 1, January 2025, afaf004, https://doi.org/10.1093/ageing/afaf004

Age-related hearing loss and mild cognitive impairment (MCI) independently increase dementia risk. The Ageing and Cognitive Health Evaluation in Elders randomised controlled trial (RCT) found hearing aids reduce cognitive decline in high-risk older adults with poor hearing.

This pilot RCT in London memory clinics randomised people with MCI (aged ≥55, untreated hearing loss defined as Pure Tone Average 0.5–4 KHz between 25–70 dB) into two groups. The intervention group received 4 sessions of hearing aid fitting and support. The control group received healthy ageing education and a GP letter recommending audiological referral. Both were followed for 6 months. Primary outcomes were recruitment (feasibility target: 50%; 95% CI: 39%–61%) and

retention (feasibility target: 80%; 95% CI: 71%–89%); intervention completion (≥2 visits) and hearing aid use (acceptability target: 80%; 95% CI: 71%–89%) for the intervention group and 50% difference between arms (95% CI: 31%–69%). Secondary outcomes included hearing aid fitting, cognition and other measures.

From October 2018 to March 2020, 58 participants were recruited (29 per group, 95% [86%–99%]). Twenty-four participants were fitted with hearing aids in the intervention arm, and 6 in the control arm (difference: 62% [42%–82%]). At 6 months, retention was 81% [69%–90%]. Hearing intervention completion (≥2 visits) was achieved by 24 (83%). Daily hearing aid use was reported by 18 (75%) intervention versus 5 (22%) control participants, a difference of 53% [29%–77%].

The authors concluded that **"**Randomisation of people with MCI to a personalised hearing intervention versus control is feasible. These findings support proceeding to a fully-powered multicentre RCT."

Implications for Advocacy

While this study is exploratory in testing out if it is possible to move to a full RCT the results showing that it is possible to measure the impact of hearing interventions in the uptake of and use of hearing aids for groups with MCI. As the authors also note "Interestingly, participants' awareness of being in the trial and their knowledge of the link between dementia and hearing loss may have improved adherence in the control group….. Several participants reported that knowing about this potential link was a strong motivator for getting and using their hearing aids."

Lim S, Turner J, Tang D, Sherman K, Sinha K, Chawla S, Carney S, Shekhawat GS, Gopinath B. Understanding hearing health-care access in Australia: Users' perspectives. Australas J Ageing. 2025 Jun;44(2):e70029. doi: 10.1111/ajag.70029. PMID: 40259880; PMCID: PMC12012597.

The aim of this qualitative study was to evaluate the barriers and enablers to current hearing health-care services in Australia for middle-aged and older adults who use cochlear implants (CI) and/or hearing aids.

Adults aged 40 years and older from the Hearing impairment Adults: a Longitudinal Outcomes Study (HALOS), with adequate English language skills, were invited to participate in a semi-structured interview about their hearing intervention journey. A thematic analysis was applied to the interview transcripts.

Thirty-one hearing device users (15 hearing aid users, 9 CI users and 7 bimodal users) across Australia enrolled in the interview. The authors identified themes from this which included; hearing care management, alternative support services, patient self-management and accessibility to hearing services. The study illustrates concerns about the criteria to secure CI funding and found that "Some CI users reported limited government funding and stringent eligibility had prevented them from promptly receiving a CI. One user (CI03) mentioned being on a waiting list to benefit from the government CI program. Hearing aid users also indicated stringent requirements that needed to be satisfied to benefit from government-funded services. "Access to rehabilitation services was also found to be important "Some CI users reported that accessing remote support had led to significant improvements in post implantation management." Another theme was lack of GP awareness of CI criteria "participants reported that audiologists had insufficient knowledge on CI referral."

The findings illustrated the need for primary health and hearing care professionals to reconsider their clinical approach with individuals with hearing loss. The authors argued that “Rehabilitation, primary health and hearing care services work together to create an integrated hearing care journey for patients.”

Implications for Advocacy.

This study is helpful in reflecting patient experience of the Australian system of hearing care. By using patient perceptions, it adds weight to arguments for ensuring that that the different elements of a patients journey need to work together to ensure optimum outcomes for the patient in being able to access services and make the right choices. It also shows that access to funding is a key determinant in some patients being able to benefit from CI in a timely way as is GP awareness of CI criteria-a common theme across a number of different health systems.

Vandenbroeke T, Andries E, Lammers MJW, Hofkens-Van den Brandt A, Mertens G, Van Rompaey V. Cochlear implantation and cognitive function in the older adult population: current state of the art and future perspectives. Braz J Otorhinolaryngol. 2025 Jan 28;91(3):101544. doi: 10.1016/j.bjorl.2024.101544. Epub ahead of print. PMID: 39879878; PMCID: PMC11803144.

In this narrative review, the authors discuss studies examining cognitive function before and after cochlear implantation in the elderly population. Given the rapidly rising incidence of dementia, management of modifiable risk factors such as hearing loss, has been seen as essential to mitigate the impact on the individual and society in general.

The authors reviewed the existing literature on cochlear implantation and cognition. The potential limitations and objective measures for cognitive functioning are discussed. Because it was a narrative nature there were no strict inclusion or exclusion criteria, allowing for a broad overview of the current state-of-the-art literature on the effects of cochlear implantation on cognitive functioning, the challenges of studying cognition in this population and future research directions.

They found that multiple studies have been able to demonstrate an improvement of cognitive functioning in older adults with severe-to-profound hearing loss after cochlear implantation. However, it is important to consider the challenges of studying cognition in this population. Evoked response potentials might have potential as an objective marker for cognition in this study population.

They concluded that “Although there is no standardized study protocol to investigate cognition after cochlear implantation, a significant improvement in cognition is observed in the majority of studies one year after cochlear implantation. The identification of an objective marker of cognitive functioning will help unravel how cochlear implantation affects cognition.”

Implications for Advocacy

This adds to the growing number of reviews that finds a clear positive impact on cognition of fitting cochlear implants. However, it notes that clearer objective markers of cognition are needed to help better research in this area. This study should help demonstrate the effectiveness of Cochlear Implants in in improving cognition and therefore provide further evidence for the importance of investing in CI provision to help ameliorate cognitive decline and improve individuals’ quality of life.