

Identifying and treating hearing loss in mild cognitive impairment: a feasibility study for an interventional trial with hearing aids.

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Age-related hearing loss is an independent risk factor for dementia, with even mild hearing loss nearly doubling risk (Livingston *et al.*, 2017). Observational studies find that wearing hearing aids may protect those with hearing loss from excess cognitive decline (Maharani *et al.*, 2018). This suggests that treating hearing loss may deliver substantial reductions in dementia risk. People with Mild Cognitive Impairment (MCI) who are at increased risk of dementia are typically diagnosed in their seventies (Sachdev *et al.*, 2015), when age related hearing loss is also common (Scholes *et al.*, 2014). A trial of hearing aids in those with MCI may clarify whether hearing aids can delay or prevent dementia. As more than 40% of new hearing aid users do not use them consistently or even at all, such a trial may be impractical because of low recruitment for hearing aids and poor retention (Aazh *et al.*, 2015).

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We aimed to find out if a trial in those with MCI and untreated hearing loss would be able to recruit and retain participants. We also looked at whether standard UK NHS pathways for hearing loss would be sufficient to ensure that potential participants have hearing aids prescribed within 3 months and that these are maintained long term.

We recruited 17 people, aged ≥ 60 years with ICD-10 diagnosis of MCI, from an NHS memory clinic in London, over 3 months. Twelve participants (12/17 = 71% [95% Confidence Interval 49-92%]) had hearing loss after a home-based assessment with a positive HearCheck screening result and confirmed in all cases as at least mild hearing loss by an audiologist through portable audiometry (pure tone average (0.5- 4 kHz) > 25 dB HL). We sent the audiometric results to the participant's General Practitioner (GP), with advice to refer to NHS audiological services (which have a 12-week target for fitting hearing aids) if appropriate. At 12 weeks follow-up, 3 participants had been referred by their GP for NHS audiological assessment (25% [95% CI:1-49%]). Of those, two received hearing aids (2/12; 17% [95% 1-38%]). At 2 years follow-up, 1 out of 8 contactable participants was still using their hearing aids (12% [95% CI:1-35%]).

Our study found that a high proportion of MCI participants attending an NHS memory clinic had untreated hearing loss. However, we also found that relying on the standard NHS audiological pathway, even after providing primary care with an audiological assessment consistent with hearing loss, resulted in low treatment uptake and low long-term adherence in people with MCI. This suggests that a trial of hearing aids in MCI could recruit participants, but that the usual audiological pathways would not be sufficient to find out whether they reduced cognitive loss. This has informed the Treating Auditory Impairment and Cognition pilot trial's intervention to include a home-based hearing assessment and hearing aid fitting, with a study audiologist and a research assistant providing motivational and practical advice and support over 3 months (TACT; <https://www.ucl.ac.uk/psychiatry/tact-trial>).

Ethical Approval

The study was approved by an NHS Research Ethics Committee (REC reference: 16/WM/0518). All potential participants gave written informed consent. Participants were also contacted again two years later to assess whether they were using hearing aids or were potentially eligible for the TACT pilot trial (REC reference: 18/LO/1196), an interventional trial with similar eligibility criteria.

Conflict of Interest

None

Description of Authors' roles

D. Proctor, S. Costafreda and D. Karia designed the study, carried out the study, interpreted data and drafted the paper. D. Bamiou, G. Lewis, G. Livingston, R. Omar and A. Schilder contributed to the design of the study, attended study meetings, and contributed to revising the paper for intellectual content.

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