

**Critical Review: In Patients with Alzheimer Disease (or Other Forms of Dementia), Will the Provision of Hearing Aids Result in a Reduction of Negative or Unwanted Behaviours?**

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Computerized search databases including PSYCHINFO, SCOPUS and CINAHL were searched using the following key words:

((Alzheimer disease) OR (dementia) AND  
(hearing loss) OR (hearing impairment) OR  
(hearing aids) OR (amplification))

No limitations were applied to these searches.

#### Selection Criteria

Studies selected for this review were required to examine and assess the impact of amplification on patients suffering from Alzheimer disease or dementia. All studies were required to include participants with full time caregivers who were able to reliably record patient's daily behaviours. No limitations were made on the tools used however participants were required to have a medical diagnosis of Alzheimer disease or dementia.

#### Data Collection

Results of the literature search yielded the following types of design consistent with the previously stated criteria: Experimental single-subject design (3) and Non-randomized clinical trial (1).

### ***Results***

#### Experimental Single Subject Design

Three of the studies analyzed employed a single subject design analysis.

Palmer, Adams, Durrant, Bourgeois & Rossi's (1998) experimental design assessed the functioning of a single patient following the provision of hearing aids. This gentleman lived at home with his caregiving wife. In this study, there was no random assignment to groups and there was only one participant. The study did not specify how this patient was selected, only that he had a diagnosis of probable Alzheimer disease and multi-infarct dementia, thus satisfying the criteria for medical diagnosis of dementia. The patient underwent a full audiometric assessment (including air conduction, bone conduction and tympanometry) and was found to have a moderately-severe sensorineural hearing loss bilaterally. After four weeks of behaviour tracking by the participant's wife with reliability confirmed by a research assistant, the patient was fitted with a monaural Oticon Multifocus In the Ear (ITE) style hearing aid. Behaviour measures were recorded via the Behave-AD questionnaire asking the wife to indicate any behaviours exhibited by the patient that may be deemed problematic or negative. The participant's wife was asked to rate how upsetting each behaviour was in an attempt to quantify any behaviours related to both dementia and communication. Four such behaviours

were identified. It was found that over the course of one month, there seemed to be a significant reduction in all of the four behaviours mentioned by the wife. In addition, the report stated that the patient was wearing his hearing aid up to 15 hrs per day at this time.

An interesting aspect of this study is that during the course of hearing aid use assessment, the patient was without his hearing aid for one full week due to its malfunctioning from ear wax. During this time behaviours of searching, pacing and repeating were found to increase slightly, and decrease once hearing aid function was restored.

It is important to note some limitations to this study. Only one participant was assessed (resulting in low power) and the assessment measures relied very much on subjective observation. Therefore, it is important to be cautious with generalizability. There is no way to control any bias in reporting as the wife and research assistant were not blind to treatment conditions. Furthermore, there was no discussion of probability in terms of significant change following hearing aid fitting. However, the findings do provide convincing evidence of the positive effect of improving he

*et al.* found either significant reductions in at least one

participated in the study. The primary goal was to determine if those with AD suffered more functional difficulties as a result of their hearing impairment. The participants were tested with basic pure tone audiometry, speech recognition and speech discrimination. The speech discrimination was done in sound field with a signal to noise ratio (SNR) of +6dB as well as without any background noise.

In terms of actual audiometric assessment, the authors did not find that the AD patients experienced any increase in difficulty on measures of speech discrimination, recognition or ability to perform pure tone audiometry. From this, the authors have postulated that patients with AD and hearing loss should derive the same or similar benefit from amplification as do their age and hearing level matched peers. However, upon examination of hearing aid use, it was found that the AD patients were far less likely to be using hearing aids ( $p < 0.05$ ) even though hearing levels and hearing handicap as measured by the HHIE were similar to controls. In addition, the authors found that patients with AD were just as likely to comment truthfully on their difficulties related to hearing impairment. It is suggested that perhaps the AD and dementia patients require much more advocacy from their caregivers or family members to encourage hearing testing and subsequent hearing aid fitting. Perhaps informing caregivers about the difficulties surrounding hearing impairment and the benefits of hearing healthcare would be ideal to promote change in this area.

Although this research study did not look specifically at the use of hearing aids in patients with AD and how they can reduce problem behaviours, its findings are still very important to the field. Durrant, *et al.* have shown that patients suffering from dementia are very capable of complying with behavioural tests and providing reliable results with which one can fit a hearing aid. It is for this reason that the study was included despite not meeting the selection criteria stated above. The use of a control group both for testing procedures and for comparing hearing aid use provides compelling evidence for that fact that dementia patients should be provided the same opportunities as their peers since hearing loss can in fact exacerbate the symptoms or behaviours of dementia.

It is possible that the use of sound field testing in this study would not provide results as accurate as those for insert testing. However, the nature of the

dementia has been made. The next step would be to take this knowledge and apply to it general practice. The research is there, it is time to use it. Perhaps hearing health care should be made a part of the regular treatment process of those with Alzheimer disease or dementia. This extends beyond the audiology clinic to encompass any professionals potentially working with a patient suffering from dementia. If all are aware of the impact of hearing ability on functioning, perhaps earlier diagnosis and treatment would make it possible to fit patients with amplification sooner, providing benefit to both the patients and their caregiver(s) throughout the disease process.

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