

Outcome measures of electroacoustic hearing – a questionnaire to evaluate bimodal satisfaction

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INTRODUCTION

Bimodal hearing is the combination of a traditional hearing aid together with a cochlear implant. Many patients who receive a cochlear implant (CI) do have some residual hearing in the opposite ear, but up to 75% of users discontinue use of their hearing aid.¹ Why some patients continue use and others do not is not fully understood. Studies have shown bimodal benefit following a cochlear implant. This may be from low frequency (125Hz-1kHz) hearing that contributes to greater localisation and speech in noise benefit.²

NICE guidance recommends unilateral cochlear implantation to be offered to patients with severe to profound deafness who do not receive adequate benefit from acoustic hearing aids.³

OBJECTIVES

This multi-centre pilot study aimed to establish whether participants experienced more satisfaction using bimodal stimulation than a cochlear implant alone, and whether this increase was related to patient factors. Establishing a candidacy for bimodal use could assist in the audiological management of this population.

METHOD

A modified Satisfaction with Amplification in Daily Life (SADL) questionnaire, as developed by Ou et. al⁴, was sent to participants. The modified SADL consisted of 12 of the original 15 items divided into four subscales; Negative, Positive, Contentment and Service & Cost. Participants were asked to complete the questions in three conditions; hearing-aid alone, cochlear implant alone and bimodal. Data were collected in Microsoft Excel and each questionnaire was screened for validity. A global score was calculated from the Negative, Positive, and Contentment subscales. Significance is given where $p < .05$.

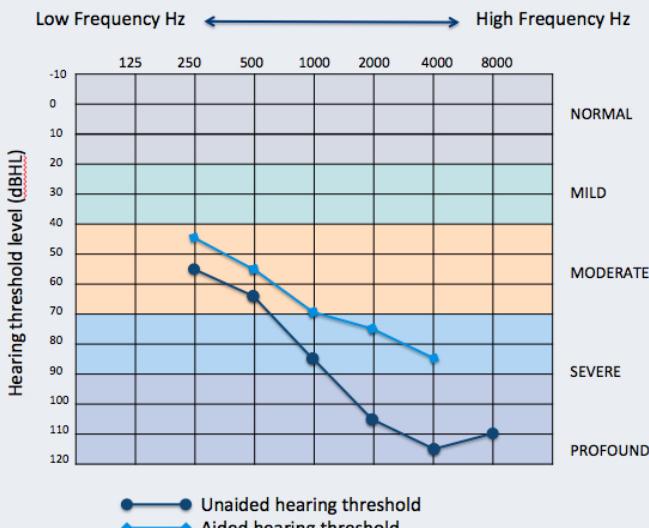


Figure 1 An example of a patient audiogram meeting NICE guidance for cochlear implantation

References: 1 Fitzpatrick, E., Seguin, C., Schramm, D., Chenier, J. and Armstrong, S. (2009) 'Users' experience of a cochlear implant combined with a hearing aid', INTERNATIONAL JOURNAL OF AUDIOLGY, 48(4), 172-182.

2 Tange, R., Grolman, W. and WA, D. (2009) 'What to do with the other ear after cochlear implantation', COCHLEAR IMPLANTS INTERNATIONAL, 10(1), 19-24.

3 NICE (2009) 'Cochlear implants for children and adults with severe to profound deafness (Technology appraisal TA166)', [online], available: [accessed 11 Jan 2014]

4 Ou, H., Dunn, C., Bentler, R. and Zhang, X. (2008) 'Measuring Cochlear Implant Satisfaction in Postlingually Deafened Adults with the SADL Inventory', JOURNAL OF THE AMERICAN ACADEMY OF AUDIOLOGY, 19(9), 721-734.

RESULTS

Participants were from the United States (n=11, mean age 63.5 years) and United Kingdom (n=16, mean age 66.5 years). Fourteen participants were included in the data analysis after screening for validity. A sample audiogram is shown in figure 1.

SADL global scores showed significantly increased bimodal satisfaction compared to using a CI alone ($p < .05$) and hearing aid alone ($p < .001$). (figure 2)

Mean SADL global scores for each hearing condition

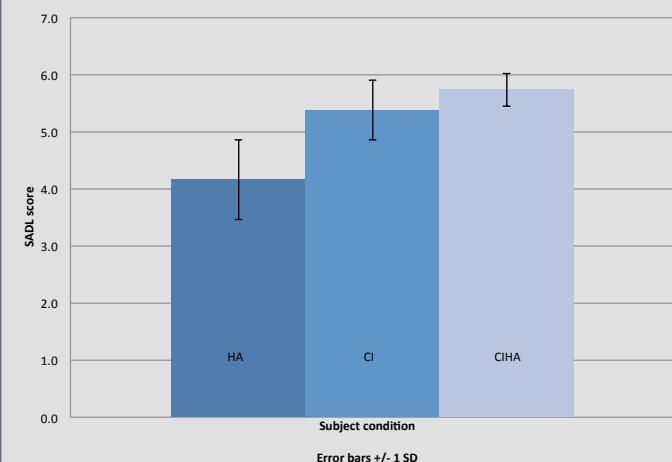


Figure 2 Mean SADL global scores for each hearing condition

DISCUSSION

The SADL global score showed a significant increase in satisfaction for bimodal use. This confirms the subjective benefit in this population who choose to continue to wear a hearing aid in the opposite ear.

Individual subscales did not show significant increase in satisfaction, therefore does not assist in the identification of reasons why subjects experienced greater satisfaction when wearing a hearing aid together with their cochlear implant.

The service & cost subscale did not show a difference in satisfaction between conditions. This was likely due to the nature of audiology provision in the UK which is free to NHS patients, unlike other countries that may use the SADL questionnaire.

A previous study in 2008 did not find a significant difference in satisfaction for bimodal users.⁴ This study, therefore, disagrees with this previous work.

CONCLUSION

Overall, it has been found that there is significant increase in satisfaction with bimodal hearing when compared to a cochlear implant alone and hearing aid alone. This confirms the subjective satisfaction in this population who choose to continue to wear a hearing aid in the opposite ear. Further work is needed to investigate whether patient factors such as hearing thresholds contribute to this satisfaction. It should be noted that this study had a small sample size and a larger study will be needed to confirm bimodal satisfaction.