A cost-utility analysis of adult group audiologic rehabilitation: are the benefits worth the cost

Abrams H, Chisholm T H, McArdle R

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Hearing aids (HAs) were compared with HAs used in conjunction with audiologic rehabilitation (HA+AR). Starkey programmable HAs were used. AR consisted of 3-hour group meetings once a week for 4 weeks.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised individuals with at least mild hearing loss in the better ear, and no experience of HA use. All patients passed the Mini-Mental State Exam and exhibited no more than mild depression on the Beck Depression Inventory. They also had no neurological, neuromuscular, psychiatric or visual disorders that could impact on the ability to independently use an HA.

Setting
The setting was primary care. The economic analysis was conducted in Florida, USA.

Dates to which data relate
The effectiveness data were collected between May 1999 and December 2001. The dates when the resources use data were collected were not reported. The price year was also not reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was carried out prospectively. The majority of the unit costs were external to the study, although the travel costs were from the same sample of patients as in the study.

Study sample
The sample comprised 105 veterans (67 male and 38 female). It was unclear how this sample was selected. Nevertheless, the sample was appropriate for the clinical question, as it comprised veterans with hearing loss who might benefit from the use of HAs and AR+HA. The authors did not report that power calculations were carried out to rule out the influence of chance on the results, although they did discuss the issue of power after the study.
patients received HA and 53 received HA+AR. There were 36 men and 16 women in the HA group and the mean age was 73.0 years. There were 31 men and 22 women in the HA+AR group and the mean age was 74.5 years. The authors did not report any refusals to participate or exclusions. Some patients were reported to have dropped out, but reasons for this were not cited.

**Study design**

The study was a randomised controlled trial. The patients were randomised to receive either HA alone or HA+AR. The method or unit of randomisation was not reported. The study was conducted at a single centre, the Audiology and Speech-Language Pathology Service at the Department of Veterans Affairs (VA) Medical Centre in Bay Pines, Florida. The patients were followed in 10-week cycles with 16 participants in each cycle. All patients were seen in the 2 weeks before the AR sessions to have the HA fitted. All patients were seen again in the 2 weeks following the end of the AR sessions. The authors did not report whether any patients were lost to follow-up. Blinding would not have been possible within this study.

**Analysis of effectiveness**

The authors did not state that the analysis was conducted on an intention to treat basis. The primary health outcomes were scores from the SF-36V quality of life scale. The physical and mental component scores (PCS and MCS, respectively) were assessed. The authors reported that independent t-tests revealed no statistically significant differences in ages or hearing thresholds in either ear between the intervention groups.

**Effectiveness results**

In the HA group, there was a 1.4-point increase in the MCS and a 1.6-point decrease in the PCS.

In the HA+AR group, there was a 3.0-point increase in the MCS and a 0.3 point-increase in the PCS.

An analysis of variance revealed a significant main effect of component scale score and a significant interaction between test time and component scale score. The analysis of variance failed to reveal statistically significant differences in treatment effect between the groups.

**Clinical conclusions**

The authors concluded that their evidence showed that with or without adjunctive AR, HA use gave positive results on the MCS scale. The authors also suggested that the inability to find statistical difference between the treatments might be related to the power of the study.

**Measure of benefits used in the economic analysis**

The summary measure of benefits used was the quality-adjusted life-years (QALYs) gained. This was taken as being the change in the score on the SF-36V mental component summary scale, multiplied by the life expectancy of the patients. SF-36V valuations were obtained for the study participants before and after treatment.

**Direct costs**

The authors did not report a perspective for their study. The categories of cost included suggested that the perspective of the third-party payer or the patient was adopted. The authors focused on billable procedures (audiological assessment, HA evaluation, HA orientation, post-fitting follow-up and aural rehabilitation) in the study setting. For each procedure the cost estimate included labour (audiologist, receptionist, clerk), supplies and materials (insert earphones, real-ear tubes, HAs), and other costs (administration, building maintenance). The cost of AR also included patient travel costs. Discounting was not necessary in this analysis because of the very short timescale. The unit costs were not reported separately, although a breakdown of the total costs according to category was provided. A price year was not reported. As the study extended over a 2-year period, the costs should have been reflated to either the beginning or the end of the study, or some other date useful for comparison.
Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
The indirect costs were not included in the study. Indeed, they were not necessary as the study population was unlikely to be economically active.

Currency
US dollars ($).

Sensitivity analysis
The authors did not report a sensitivity analysis of the costs.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The total cost per person was $1,056.73 for HA alone and $1,119.43 for HA+AR.

Synthesis of costs and benefits
HA cost $60.00 per QALY gained, while HA+AR cost $31.91 per QALY gained

Authors' conclusions
Hearing aid (HA) use in conjunction with audiologic rehabilitation (AR) was the more cost-effective treatment.

CRD COMMENTARY - Selection of comparators
The authors compared HA with HA+AR for the treatment of veterans with hearing loss. The alternatives were thoroughly discussed, with the authors presenting substantial evidence for both. HA use alone appears to have been standard practice in the authors’ setting. You should decide if they represent valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a randomised trial with alternatives that represented real treatments, which might be used in practice. This design is ideal, as it reduces the possibility of bias whilst also giving results that relate directly to clinical practice. The sample population was well represented by the sample chosen, although it was unclear how the specific sample was chosen. In addition, it was unclear whether the sample represented all eligible veterans presenting at the study setting, or some sub-set. The patient groups were said to be comparable in terms of age and hearing thresholds. Summary statistics for other demographic variables were not discussed. The authors presented effectiveness data for mental and physical function within the SF-36V scale which, whilst giving an indication of health and well-being, is not a comprehensive measure. For instance, the authors might also have asked about social roles and function, as better hearing may have a significant impact on an individual’s ability to play an active role in society. Yet social function was not included in the effectiveness estimates. Nevertheless, the results presented gave valuable information about the impact of the two technologies on some aspects of health.

Validity of estimate of measure of benefit
The summary estimate of benefit was obtained directly from the effectiveness study. Whilst QALYs are a useful comparison tool, in this case the QALY estimate did not consider all aspects of quality of life. In fact, the authors stated that only the mental component was used. Therefore, the QALY estimate does not provide a true reflection of overall quality of life and is misleading.

**Validity of estimate of costs**

The authors did not report a perspective for the cost analysis. Therefore, it was not possible to assess whether all the relevant costs were included. The initial costing appears to have represented that of the third-party payer, with the inclusion of all billable expenses. However, the authors also went on to include transportation costs for AR visits, suggesting a broader perspective. Altering the study perspective may have a significant impact on the study results, as the AR costs were the only source of cost difference between the two alternatives and approximately half of the AR costs represented transportation. The additional AR billable cost was only approximately $30. Therefore, the cost-effectiveness from a third-party payer perspective only is more expensive per outcome than the results presented would indicate. The quantities were broken down but the unit costs were not reported separately.

**Other issues**

The authors made appropriate comparisons of their findings with those of other authors. In particular, they referenced a review study that found similar results. However, the results cited in the discussion do not appear to be consistent with those presented in the results section of the paper. The authors referred to a change score of 2.2, but this quantity was neither presented nor apparent. The issue of generalisability was explicitly discussed, with the authors highlighting problems in generalising to populations other than veterans. The generalisability to other settings was not addressed. Several limitations were presented. For example, other benefits, such as reduced visits to the clinic for HA modification and for reduced HA returns and reorders, were excluded from the study. The authors also mentioned the lack of patient level data as a significant disadvantage.

**Implications of the study**

The authors did not make any recommendations for policy or practice following their study, although they emphasised the importance of examining the cost of audiologic services at group and patient levels.

**Source of funding**

None stated.

**Bibliographic details**


PubMedID 17684833

**Other publications of related interest**


**Indexing Status**

Subject indexing assigned by NLM
MeSH
Adult; Combined Modality Therapy; Costs and Cost Analysis; Female; Hearing Aids /economics; Hearing Loss /economics /rehabilitation; Humans; Male; Rehabilitation /economics

AccessionNumber
22002009666

Date bibliographic record published
31/12/2004

Date abstract record published
31/12/2004