Reviewer's report

Title: A Retrospective Study of Cochlear Implant Outcomes in Children with Residual Hearing

Version: 1 Date: 24 January 2006

Reviewer: Richard Dowell

Reviewer's report:

General
This manuscript presents the results of a clinical study that attempts to quantify the benefits of cochlear implantation in children who demonstrated some “auditory capacity” prior to implantation. The question addressed is important as there is a relative lack of scientific evidence to guide clinicians in providing recommendations about cochlear implantation in children. The wide range of outcomes for children using cochlear implants and the difficulty in assessing auditory capacity in young children make for a level of confusion as to the benefits of the implant procedure in individual cases. This study adds to the clinical knowledge in the field although, as acknowledged by the authors, it suffers from being a retrospective review of a small number of children with hearing-impairment. The manuscript could be improved with attention to the following points.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)
No major revisions are suggested

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
On page 5 in the first para it is noted that children with a diagnosis of auditory neuropathy were excluded from the study. A brief explanation of the rationale would be appropriate.
Also on page 5, it is noted in para 3 that no child continued to wear a hearing aid in the contralateral ear after surgery. This is surprising, as it is common in other implant programs that children and adults with significant auditory capacity in the contralateral ear continue to wear their hearing aids. It has been demonstrated that both adults and children in this situation can gain significant benefit from the use of the two devices (see Ching et al, Ear Hear 2001, Ching et al, Ear Hear 2004, Dettman et al, Arch Otolaryngol, 2004). This reviewer questions whether there is a policy at the cochlear implant centre or the educational facility where these children attend that discourages the use of the hearing aid in the contralateral ear. This issue should be addressed.

On page 6, para 1, it is noted that a score of 0% was assigned for open set assessments when other tests suggested that this would probably be the score if the test was performed. Researchers in the field have had to put up with this problem for 30 years, that is, putting adults and children through testing when we know they will perform poorly. I have a good feel for the problems of testing children with these, often tedious, speech perception tests, but I don’t think we can create data that is not there. I feel a different treatment is needed as it is misleading for the reader to compare pre and post-treatment scores when the pre-treatment test has not actually been done. If the authors have a set of scores on open-set and closed-set tests (for a large enough group) where a strong relationship can be demonstrated between them, then it would be legitimate to estimate one from the other (or estimate a range for one from the other).

The first para of the results section suggests that the data indicate “marked improvement” for all but two children. How is this defined? Does it have some relationship to functional ability or is it just a...
subjective judgement? In a small sample, the results might as well be presented for all subjects, as they are in the figures, with additional statistics such as mean, s.d., median, range etc., where useful. There are methods for assessing the significance of a difference between two speech perception scores based on binomial modelling (Thornton and Raffin, J Sp Hear Res, 1978) so this could be used as a basis for deciding which children have demonstrated improvement.

The second para of the results section on page 6 gives a summary of results for open-set sentence testing. I feel that there are some important issues that should be addressed either here or in the discussion related to scores on sentence tests. As described in Blamey et al, JSLHR 2001, there is a very strong relationship between language ability and scores on sentence tests. It is likely that sentence scores will improve over time for all children as their language develops, not to mention improvements in attention and cooperation as they mature. When we are demonstrating improvements in auditory capacity over time in children, this confounding factor needs at least some mention. I do not believe this detracts from the overall conclusion of the study that the cochlear implant has provided significant benefit to this group.

The last para on page 6 uses the term “markedly improved” this time referring to another study. Again, the term statistically significant may be more appropriate.

Discretionary Revisions (which the author can choose to ignore)
Not aplicable

What next?: Accept after minor essential revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:
I declare that I have no competing interests