Speech Perception in Noise with Cochlear Implant and Hearing aid for implanted adolescents.

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Objective. To describe the open set speech perception performance for 8 congenitally deaf adolescents who use a multichannel cochlear implant and behind-the ear hearing aid as their 'everyday listening' condition.
Expanded indication for cochlear implant inclusion has lead to the implantation of a number of persons with severe to profound hearing loss. It has been suggested that persons who have some residual hearing are good candidates for the cochlear implant due to: the presence of more ganglion cells, prior auditory experience, pre-patterning of the auditory cortex or other factors, as yet unknown, such as language experience.

Method. Eight congenitally deaf adolescents, implanted after the age of 8 years, completed two open set speech perception measures (BKB sentence tests and PBK word test) pre-operatively and at 3, 6 and 12 month intervals post operatively. Subjects were tested using three possible listening conditions: Implant alone, Hearing aid alone, and Binaural mode (implant and hearing aid combined). Testing of the BKB sentences and PBK words was completed using live voice presentation with no competing noise. Testing of the BKB sentences was also completed using a taped signal in the following conditions: quiet, +10, +5 and Zero signal to noise ratio.

Results. These eight subjects demonstrated significant open set performance within 6 months use of the cochlear implant. Four subjects were able to obtain significant open-set sentence comprehension at zero signal to noise ratio. In approximately half of the cases the Implant alone result was not significantly different to the Binaural mode, that is, the hearing aid was demonstrated to have no effect on the speech perception scores. For the remaining subjects the Binaural result was significantly better that the Implant alone result. The results suggest that these subjects were able to combine the input effectively.

These results are discussed with reference to aided threshold levels and expressive and receptive language measures. Analysis of these results may predict post-operative performance with the cochlear implant. Such information would assist the pre-operative counselling process for some patients.

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