Monday, Poster 22

SHORT-TERM AUDITORY MEMORY IN CHILDREN USING COCHLEAR IMPLANTS

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There are many factors contributing to the variance in language performance of children using cochlear implants. Typically studies have investigated the predictive value of demographic factors such as duration of profound deafness. It is possible that profound auditory deprivation prior to implantation may have caused auditory processing deficits at a cortical level and, in particular, a deficit in short-term, sequential auditory memory. The aim of the study was to assess short-term sequential auditory memory ability in young children using cochlear implants and to investigate the relationship of this ability to receptive language performance.

Twenty-four children using the Nucleus 22-electrode cochlear implant and twenty-four age-matched, normally hearing children were tested on five short-term sequential memory tasks, three with auditory stimuli and two with visual stimuli. There were an equal number of children in each of the age groups; 5-6 years, 7-8 years and 9-11 years. The memory tasks were designed to minimise the effect of auditory discrimination ability. Therefore stimuli were chosen for which children with cochlear implants could demonstrate accurate identification of the stimuli at a similar reaction time to the normally hearing controls. Each child was also assessed on a receptive language test and on a nonverbal intelligence scale.

As expected children using cochlear implants showed poorer sequential short-term memory skills than normally hearing peers for tasks that invited verbal coding. However they performed similarly to their hearing peers on auditory and visual memory tasks where the stimuli were less likely to be encoded verbally. The children using cochlear implants did not appear to have a deficit in short-term memory specific to the auditory modality. The difference scores (visual minus auditory performance) for the implanted children did not differ significantly from the difference scores for the normally hearing children. A stepwise regression analysis revealed that visual spatial memory (one of the nonverbal IQ subtests) was the main predictor of variance in the language performance and that closed-set word recognition and one of the visual SSTM tests accounted for additional variance.

Support provided by the Lions Club International, the Human Communication Research Centre at the University of Melbourne, Australia & the Garnett Passe & Rodney William Memorial Foundation.

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