**Cochlear Implantation: Role of Language, Income, and Ethnicity**

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**Introduction:** Cochlear implants (CI) provide significant benefit to children with severe hearing disabilities. However, this benefit is not solely reliant on the implantation of the device, but instead is reflective of many factors. It is well known that age, pre-operative language ability & medical history affect CI outcomes. Scarce literature is available, however, on the effect of cultural background, socioeconomics, language and family income. These variables likely have a profound impact on post operative rehabilitation, implant programming, and overall CI success. In order to optimize CI performance, the relationship of these variables to post operative speech perception testing must be investigated.

**Objective:** To compare post- CI speech perception (SP) between predominately non-English speaking, ethnic minority and English-speaking, ethnic majority children.

**Design:** Retrospective case –control study at a tertiary care children’s hospital.

**Methods:** Review of records yielded 49 children undergoing CI between February 2005 and September 2011. 37 were excluded due to abnormal cognitive function, post-surgical complications, and incomplete SP testing. Of the remaining 12, 7 were Hispanic, 2 Caucasian, 2 multi-ethnicity, and 1 Russian. 7 children were bilingual, English was a second language for 5, and 4 were non-English speaking. All 12 had bilateral profound SNHL. 3 underwent bilateral CI. The 12 cases were reviewed for language, income, ethnicity, and SP scores. The SP scores were compared to those of the Childhood Development After Cochlear Implantation Study (CDaCI) which attempts to define normative post-CI outcomes. Our resulting groups had equivalent neurological status.

**Results:** The 12 patients underwent CI at 1-10 years of age (mean=4.3). Early Speech Perception scores were collected at 6 and 12 month post-op. The study group of predominantly non-English-speaking, ethnic minority children performed worse than children in the control group at both time points. (6 months—p=0.048; 12 months—p=0.01)

**Discussion/Conclusions:** Patients from non-English speaking, socioeconomically disadvantaged backgrounds develop SP at slower than normal rates. It is possible that our older age at implantation impacted SP scores, however we do not believe that this factor alone explains the significant difference between the two groups. The development of individualized CI therapy for this ethnic minority population may improve speech perception and overall CI success.

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**Early Speech Perception Test**

ESP is introduced when a child is 2y or able to choose between two alternatives. It assesses pattern perception, spondaic word identification, and monosyllabic word identification in a closed set. Performance is classified into four categories. (Detection-1, Pattern Perception-2, some word identification-3, consistent word identification-4)

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**The CDaCI Study**

The CDaCI Study is the first longitudinal, multicenter, national cohort study to assess early CI outcomes in children. From 2002 to 2004, 188 CI and 97 normal hearing children were enrolled from 8 U.S. centers. The purpose of the study is to identify factors that influence language learning across multiple domains, to assess the effectiveness of pediatric CI, and begin to define normative performance data and prognosis after CI.

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**Images 1 & 2**

CI recipients receiving post operative therapy in the Bronx

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**References:**