

Cortical auditory evoked potentials (P1 latency) in children with cochlear implants in relation to clinical language tests

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Background

The central auditory pathways in the juvenile brain need auditory stimulation to develop properly. The prelingually deafened child is deprived of essential auditory stimulation. A CI provides a means of neural stimulation by electrical impulses to the auditory nerve. To evaluate the maturing auditory system in groups that cannot participate themselves, e.g., infants, there is a need for methods to test the neural response to sound stimulation are needed. These methods need to be harmless, reliable and clinically available.

Aim

To study the correlation between P1 latency and the results of clinical language tests (Reynell III and TROG-2), the latter were used as they are recommended for follow-up assessments of children with cochlear implants (CIs) by the Swedish national quality register for children with hearing impairment.

Method

Cross-sectional and consecutive sampling of 49 children with CIs coming for clinical follow-up assessment from March 2017 – December 2019.

Result

For all children tested, there was a significant negative correlation (Spearman's $\rho = -0.403$, $p = 0.011$) between hearing age and P1 latency. A significant correlation between P1 latency and the Reynell III result (Spearman's $\rho = -0.810$, $p = 0.015$) was found.

Discussion

The results indicated that P1 latency has a negative correlation with language development among our youngest patients fitted with CIs and might be a clinical tool to assess the maturation of central auditory pathways.