

Time of Cochlear Implant Use Obtained From Data Logging and Word Discrimination Performance of Children

Abstract

Aim: Children with hearing impairments need to be exposed to speech as soon as they receive cochlear implants (CI) to develop proper speech and listening abilities. Implantation age of children decreased dramatically with hearing screening programs and speech outcomes of these children improved considerably. There are different variables mentioned in the literature that predict the implantation outcomes of children. Among these variables, the time of CI use has been the focus of various studies before, and positive correlations were suggested, but the findings were limited and the data used in these studies were mostly based on observations of parents. Hence, the aim of this study is to investigate the relationship between objectively gathered data logging measurements, patient related variables and speech discrimination performance of pediatric cochlear implant users.

Material and Methods: 24 prelingually implanted children with the ability to perform word discrimination test were included in this study. In order to reveal the relationship between word discrimination and time of use, three data logging variables were included: (a) time on air (hour), (b) speech in quiet (hour) and (c) speech to on air ratio (percent). In addition, implantation age (months) and cochlear implant use (months) were taken into account. Finally, correlations between these five variables and word discrimination scores (WDS - percent) were analyzed with Pearsons correlations test.

Results: The average age of subjects were 66,78 months (range 46-80). It was found that mean values for time on air was 11,69 hours, time on speech was 2,35 hours, on air/speech ratio was %19,95, CI age was 24,52 months, CI duration was 42,26 and WDS was %70,96.

“This research has been presented in the 11th Asia Pacific Symposium on Cochlear Implants and Related Sciences - 19-22 September, 2017 in Famagusta, Turkish Republic of Northern Cyprus”

Proceeding

Volume 9 Issue 3 - 2017

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Received: Deceember 09, 2017 | **Published:** December 11, 2017

Correlations between WDS and time on air ($r: 0,56$), time on speech ($r: 0,72$), on air/speech ratio ($r: 0,64$), CI age ($r: -0,64$) and CI duration ($r: 0,55$) were statistically significant ($p < 0,01$).

Conclusion: We observed a moderate to strong relationships between WDS and CI-related parameters such as time on air and time on speech, and patient-related parameters like implantation age and CI duration. The critical importance of early intervention is well-known in the literature, which has also been corroborated by our findings. However, the key point revealed through the findings of the present study is that consistent CI use and the quality of daily listening environment have also a major and positive effect on the speech discrimination performance of pediatric CI users.