Correlation between the impedance values and behavioral MCL in children with the MED-EL

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Aims: The first purpose of this study is, to know how the impedance values (Z) change with cochlear implant use and the second one is to determine if there is a correlation between maximum perceptual levels and impedance values in order to adjust maximum hearing levels in very young children.
Method: Longitudinal telemetric measurements (Z) in children implanted with the Combi 40+ systems were performed at the first fitting and every three months up to 24 months of using the system. The correlation coefficient R between Z and the Maximum Comfortable Levels MCL, (**RZMCL**) was calculated at the same period of time, as well as the linear estimation.
Fifty-nine patients divided in 4 groups participated in this study: Group I: 12 patients from 2 to 4 years old; Group II: 16 patients from 4 to 6 years old; Group III: 18 patients from 6 to 9 years old and Group IV: 13 patients from 9 to 14 years old.
Results: A good correlation RZMCL was found in most of the patients, especially those belonging to groups III and IV. An increasing correlation was observed over time in most of the patients, indicating a better MCL determination.
The values of MCL where modified to increase the correlation value. All the changes where previously tested in the patients to ensure comfortable perception.
Loudness balance and vowels discrimination were tested in several old children before and after the maps were modified. The scores of vowel discrimination improved with the use of such modified maps, perhaps indicating a better loudness balance at MCL.
Conclusion: The method of the MCL modifications to improve (RZMCL) drive us to obtain a better determination of the maximum level in young children and consequently better loudness balance at those levels which in time produce better auditory conditions for the language acquisition.