

The music perception abilities of prelingually deaf children with cochlear implants

Objective

- To investigate the music perception abilities of prelingually deaf children with cochlear implants, in comparison to a group of normal-hearing children, and to consider the factors that contribute to music perception.

Methods

- The music perception abilities of 39 prelingually deaf children with unilateral cochlear implants were compared to the abilities of 39 normal hearing children. To assess the music listening abilities, the MuSIC perception test was adopted. The influence of the child's age, age of implantation, device experience and type of sound-processing strategy on the music perception were evaluated. The effects of auditory performance, nonverbal intellectual abilities, as well as the child's additional musical education on music perception were also considered.

Results

- Children with cochlear implants and normal hearing children performed significantly differently with respect to rhythm discrimination (55% vs. 82%, $p < 0.001$), instrument identification (57% vs. 88%, $p < 0.001$) and emotion rating ($p = 0.022$).
- However we found no significant difference in terms of melody discrimination and dissonance rating between the two groups. There was a positive correlation between auditory performance and melody discrimination ($r = 0.27$; $p = 0.031$), between auditory performance and instrument identification ($r = 0.20$; $p = 0.059$) and between the child's grade (mark) in school music classes and melody discrimination ($r = 0.34$; $p = 0.030$).

- In children with cochlear implant only, the music perception ability assessed by the emotion rating test was negatively correlated to the child's age ($r_s = 0.38$; $p = 0.001$), age at implantation ($r_s = 0.34$; $p = 0.032$), and device experience ($r_s = 0.38$; $p = 0.019$). The child's grade in school music classes showed a positive correlation to music perception abilities assessed by rhythm discrimination test ($r_s = 0.46$; $p < 0.001$), melody discrimination test ($r_s = 0.28$; $p = 0.018$), and instrument identification test ($r_s = 0.23$; $p = 0.05$).

Conclusions

- As expected, there was a marked difference in the music perception abilities of prelingually deaf children with cochlear implants in comparison to the group of normal hearing children, but not for all the tests of music perception.
- Additional multi-centre studies, including a larger number of participants and a broader spectrum of music subtests, considering as many possible of the factors that may contribute to music perception, seem reasonable.