Electric complementation of hearing in the treatment of partial deafness in the case of siblings

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Partial deafness with functional hearing up to the level of 0.5 kHz and no reception of comprehensible acoustical sensation on other frequencies requires only to electric complementation in the medium and high frequencies (PDT – EC). This type of hearing loss is rare, especially among children.

We present the results of the hearing preservation at the sisters with partial deafness underwent cochlear implantation.

Introduction

Despite excellent results of hearing loss compensation in most cases using of hearing aids, there is still a group of children whose type of hearing loss remains outside the scope of traditional hearing aids and, at the same time, does not full-fill the traditional eligibility criteria for cochlear implantation in many countries. An example of such group are children with normal hearing in the frequencies 125-500 Hz and severe-to-profound hearing loss in frequencies above 500 Hz, who are qualified according to the PDT classification into Electro-Complementation (EC) group.

Objectives

The aim of the study was to assess the hearing preservation at the sisters with partial deafness who underwent cochlear implant surgery.

Methods

The paper presents cases of currently 12 and 6-year-old children with deafness type of PDT-EC. The older sister was implanted at the age of 7, younger in a 4-year-old. The surgery was performed in accordance with the six-step surgical procedure developed by Skarżyński. In order to calculate hearing preservation, the new Hearing Preservation Classification system proposed by Skarżyński et al. (2013) based on pre- and post-operative PTA, was used.

Results

In case of older girl, based the Hearing Preservation Classification the mean value of hearing preservation in the implanted ear 5-years after surgery was 57.3%. The average hearing preservation of younger sister assessed during 12-month follow-up was equalled 89.9%. Before the surgery, patients presented auditory reactions at the level of 30-80 dB only in the frequency range 250-1000 Hz in the free field audiometry test. After 12 months of operation, the hearing threshold in CI presented at the level of 20-45 dB in whole frequency range.

Conclusion

Many scientific studies confirms that the occurrence of genetic mutations leads responsible for hearing loss. However, rarely observed cases of related patients with similar partial deafness, for which the only effective treatment is used an electric complementation for medium and high frequencies.

References