

Abstract

The cochlear implant (CI) is the primary means of treating severe to profound sensorineural hearing loss, but it is not suitable for patients with severe damage or absence of the auditory nerve. The auditory brainstem implant (ABI) is an electronic implant device that converts sound into electrical stimulation and directly targets the auditory brainstem (i.e., the cochlear nucleus complex), thereby providing a certain degree of auditory compensation for patients who are not suitable for CI implantation or do not benefit from CI.

The children in this case study have undergone bilateral implantation. Friedmann et al. [1] have indicated in their research that over half of the patients who use both CI and ABI simultaneously exhibit improved auditory performance. Building upon this, we regularly provides personalized one-on-one teaching combined with family support for the children in this case and reports on their rehabilitation outcomes. This approach aims to explore the application of such a rehabilitation model within the population of bilateral implant children.

Objectifs

To report the rehabilitation practices in a child who received bimodal implant (CI on one ear & ABI on the other side ear) and explore methods to improve speech intelligibility in this population.

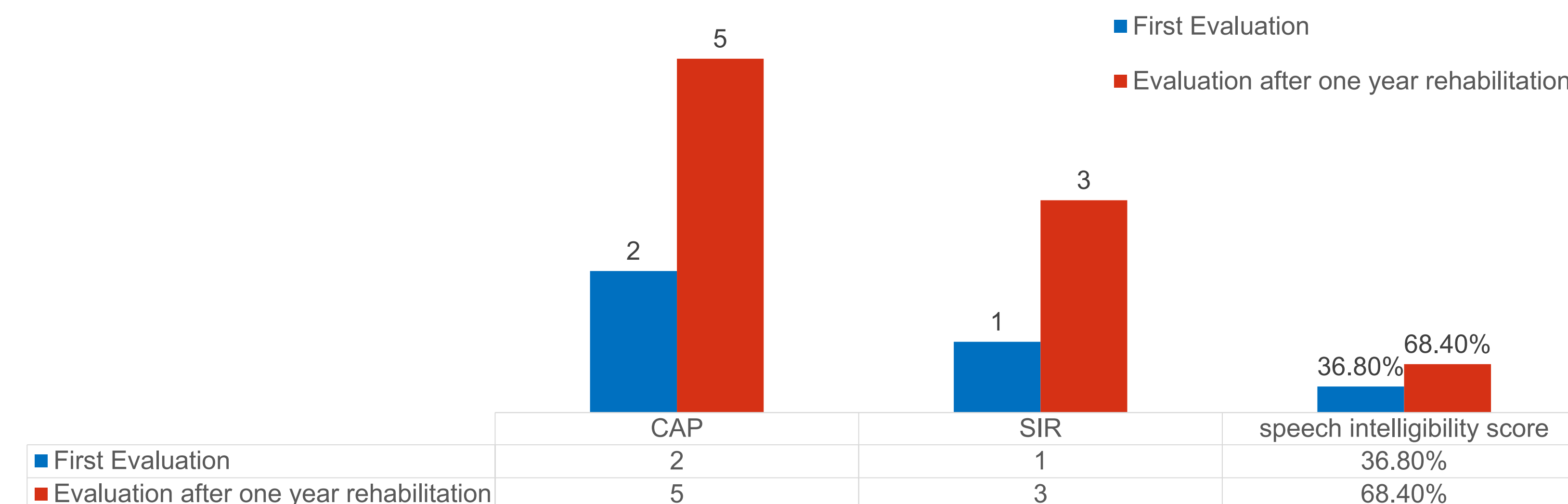
Méthodes et Matériels

The rehabilitation therapist employed speech intelligibility assessments, categories of auditory performance (CAP) questionnaire, and speech intelligibility rating (SIR) questionnaire to identify current auditory and speech challenges in this bimodal recipient. Based on the findings, a targeted training plan was developed, involving regular one-on-one sessions and family-based rehabilitation support.

The rehabilitation of bimodal implant children in this case focuses on respiratory training (playing the harmonica), oral motor exercises (eating fruits with a firmer texture), and articulatory speech training (facilitating coordinated movements of respiration and articulation), supplemented with sensory modalities and gamified activities for speech correction, while also emphasizing active parental participation in the process.

Résultats

After one year of auditory and speech rehabilitation, through auditory-driven speech production and reinforcement of articulation patterns, the child demonstrated a 31.6% improvement in speech intelligibility score, and an increase in CAP and SIR score, reaching 5 and 3, respectively.



Conclusion

In the context of bimodal for hearing-impaired children, extended rehabilitation duration is associated with an overall improvement in auditory perception and speech production. The results suggest that the intervention pattern, combining one-on-one training with family-based rehabilitation support, effectively enhances speech intelligibility in bimodal children.

Références

[1] Friedmann, D.R., Asfour, L., et al. Performance with an Auditory Brainstem Implant and Contralateral Cochlear Implant in Pediatric Patients [J]. *Audiol Neurotol.*, 2018, 23(4), 216-221.