



REVIEW ARTICLE

Performance of hearing skills in children with auditory neuropathy spectrum disorder using cochlear implant: a systematic review^{☆,☆☆}



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KEYWORDS

Evaluation;
Child;
Cochlear implants;
Hearing loss;
Speech perception

Abstract

Introduction: Currently, there are no doubts about the benefits of cochlear implants for the development of children with severe or profound hearing loss. However, there is still no consensus among researchers and professionals regarding the benefits for the improvement of hearing skills in children with auditory neuropathy spectrum disorder using cochlear implants.

Objective: Review the available evidence in the literature to answer the following: “What is the performance of hearing skills in children with auditory neuropathy spectrum disorder using cochlear implants?”

Methods: Systematic review of the literature through electronic database consultation, considering publications in the period 2002–2013.

Results: Twenty-two studies met the criteria and were included in the systematic review.

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¹ In memoriam.

PALAVRAS-CHAVE

Avaliação;
Criança;
Implante coclear;
Perda auditiva;
Percepção da fala

Conclusion: The analyzed studies demonstrated that after cochlear implant surgery, individuals with auditory neuropathy spectrum disorder improved their performance of hearing skills and had similar performance to that of children with sensorineural hearing loss using cochlear implant.

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Resultados do desempenho das habilidades auditivas em crianças com o espectro da neuropatia auditiva usuárias de implante coclear: revisão sistemática
Resumo

Introdução: Atualmente não restam dúvidas quanto aos benefícios do uso do implante coclear no desenvolvimento da população infantil com perda auditiva de grau severo e/ou profundo. Entretanto, ainda não há um consenso entre pesquisadores e profissionais sobre os seus benefícios para a melhora das habilidades auditivas em crianças com o espectro da neuropatia auditiva usuárias de implante coclear.

Objetivo: Revisar a evidência disponível na literatura para responder ao questionamento: “Quais os resultados do desempenho das habilidades auditivas em crianças com o espectro da neuropatia auditiva usuárias de implante coclear?”

Método: Revisão sistemática da literatura, a partir da consulta de bases de dados eletrônicas, considerando publicações no período de 2002 a 2013.

Resultados: Vinte e dois estudos contemplaram os critérios e foram incluídos na revisão sistemática.

Conclusão: Os estudos analisados demonstraram que, após a cirurgia de IC, os indivíduos com o espectro da neuropatia auditiva melhoraram o desempenho das habilidades auditivas e apresentaram desempenho semelhante ao de crianças com perda auditiva sensorineural usuárias de implante coclear.

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Introduction

The development of the skill to perceive speech sounds by an individual with auditory neuropathy spectrum disorder (ANSD) is challenging for all professionals involved in the field of education and clinical audiology, due to changes in the conduction of the auditory stimulus.

The literature defines ANSD as a change in neural synchrony, characterized by an auditory behavior in which the function of outer hair cells (OHC) is shown to be preserved, while the afferent neural transmission is altered.¹ This hearing impairment can significantly affect speech perception and the development of hearing and language abilities.

The indication of cochlear implant (CI) in this clinical group is based on the ability of the device to partially replace the functions of the auditory sensory cells and directly stimulate the auditory nerve, benefiting neural synchrony and thus contributing to the development of hearing skills.²⁻⁷

The studies reviewed suggest that the benefits of CI use in children with ANSD, particularly with respect to language acquisition and development of hearing skills, are related to the period of use of this device, the existence of the phonoaudiological rehabilitation process, time of diagnosis,

and child's age. However, there is no consensus among studies with respect to how and when the child achieves good development, and on the detailed outcome of the performance of hearing skills in children with ANSD, specifically the skills of hearing detection, discrimination, recognition, and understanding;^{8,9} rather, the results of the studies are presented more generally.

Thus, this study aimed to review the available scientific evidence in the literature to identify studies on the performance of hearing skills in children with ANSD using CI.

Methods

To achieve the objective of this study, the following question was proposed: “What is the performance of hearing skills in children with ANSD using CI?”

During the literature search, the search strategy combined six descriptors (“cochlear implant,” “hearing,” “hearing loss,” “child(ren),” “speech perception,” and “speech intelligibility”) indexed in DeCS (Health Sciences Descriptors), and two descriptors (“auditory neuropathy” and “auditory neuropathy spectrum disorder”) not indexed in DeCS, using various combinations of these descriptors in

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