

A study on the hearing of children with non-syndromic cleft palate/lip

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Summary

Children with cleft lip/palate often present otitis media as a result of anatomic and/or functional alterations of the Eustachian tube. **Aim:** to analyze the results of Basic Audiologic Evaluation (BAE) and Auditory Processing Screening (APS) in children with cleft lip/palate. **Study design:** prospective cross-sectional cohort. **Materials and methods:** Forty-four male and female children, within the 8 to 14 age range with non-syndromic cleft lip/palate, referred by the institution where the study was carried out. The BAE was made up by an interview, otoscopy, threshold tonal audiometry, logaudiometry and impedance test. The APS was made up of 3 basic tests: Sound Localization Test, Sequential Memory for verbal and non-verbal sounds and Dichotic Listening Test. **Results:** The BAE revealed that 77.27% of the children presented normal hearing; 13.6% had conductive hearing loss and 2.2% presented mixed hearing loss. 21.2% of the children had type C tympanometry curve; 7.1% had a type B curve and 3.5% had an Ad curve. The APS was altered in 72.7% of the children and 45.5% of them presented altered results on the Dichotic Listening Test. **Conclusion:** children with cleft lip/palate had altered results on BAE and APS, which justifies audiological and medical follow-up.

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INTRODUCTION

Hearing is the main link human beings have with the environment. In order to make communications possible, we need to first hear and understand, so that we can provide an answer using language.¹ The first years of life have been considered paramount for language development and it is through hearing that the child comes in contact with the world of sound and language structures, which will later make up a structured communication system.² Proper hearing system anatomical and physiological integrity, auditory pathway maturity and sound stimulation are essential for the acquisition and development of verbal language.

Hearing problems may represent an isolated clinical situation or be associated to other alterations. Among the alterations found associated with hearing, we emphasize cleft lip and palate (CLP). Congenital CLP develop during the embryonal and early fetal periods, clinically represented by no closure of the lip, palate or both.³ It is estimated that for every 1000 live births, one would have some type of cleft lip and/or palate.⁴

There are numerous systems used to classify and anatomically describe the type of fissure. The Spina classification⁵ is the one most used today, and it is based on lesion location in relation to the incisive foramen. The pre-incisive foramen cleft involves the lip and the alveolar arch and it can be uni or bilateral. The post-incisive-foramen cleft involves the hard and soft palate and can be uni or bilateral. The clefts which involve both the pre and the post foramen regions are called transforaminal.

Individuals with cleft lip and palate can have speech, dental, orthodontic and emotional problems. In children with CLP the most common hearing-related alteration is otitis media, caused by anatomical and/or functional malformations in the Eustachian Tube and in velopharyngeal sphincter (VPS) region. In order to better understand how this happens, it is necessary to better understand the structures involved.

The VPS is a muscle strip located between the oropharynx and the nasopharynx, involving the muscles of the soft palate, lateral and posterior pharyngeal walls, having a close relation with the Eustachian Tube, since the muscles are inserted in the tube cartilage and in the adjacent cranial base.⁶

The Eustachian tube is a tube which connects the tympanic cavity with the nasopharynx. During most of the time, the tube remains closed, and its main function is to balance the air pressure in the middle ear with that of the outside. It also protects against pressure and secretions coming from the nasopharynx and drains secretions produced in the middle ear.⁷ The soft palate stiffening muscle is responsible for opening the tube and it does so lowering the soft palate anteriorly during swallowing.

For properly performing this task, it is essential to have an intact palate and its structures.

Thus, the main reason for having secretory otitis media in children with CLP is described in the literature as being chronic tube dysfunction, because of a failure in the tube opening mechanism. In patients with cleft palate, the tube does not open during swallowing because the soft palate stiffening muscle does not work properly, since it remains stuck in its palate insertion or it has some alteration in its course and insertion. If ventilation does not happen properly, functional tube obstruction can cause the presence of sterile fluid in the middle ear. Even when functionally obstructed, the tube can open and cause the aspiration of nasopharynx secretions, thus maintaining the secretory otitis media. This ear alteration is more frequent in incisive trans-foramen and post-foramen fissures, since these are the ones which involve the hard and soft palates^{6,8}.

The presence of secretion in the middle ear or tympanic membrane perforation causes difficulties in sound transmission. The oscillating characteristic trait of recurrent otitis media causes fluctuation in sound detection and such situation causes lack of auditory stimulation consistency, difficulties in binaural integration and distortions in the received message - impairing hearing, speech and language development. Therefore, the hearing loss restricts the acoustic information organization and classification process - auditory processing. Such situation leads to a difficulty for the child to develop language concerning expression and understanding, and there can be problems associated with reading and writing (grapheme exchanges) and even behavioral difficulties or social distress.⁹

The early detection of the hearing loss is possible through Basic Auditory Evaluation tests (BAE), which pinpoint the degree and type of hearing loss, and they also report on the integrity of the entire peripheral auditory system. The identification of possible auditory processing disorders by means of the Auditory Processing Screening (APS) allows for a more proper treatment approach, besides better educating family members and health care professionals involved with the patient.

Thus, the goal of the present study was to evaluate the performance of children with non-syndromic cleft lip and palate and/or cleft palate alone regarding basic audiologic evaluation and auditory processing screening.

MATERIALS AND METHODS

This study is a cross-sectional historical cohort, developed in the Health Care Area - CEPRE of the School of Medical Sciences (FCM) of the State University of Campinas, approved by the Ethics Committee of the FCM/UNICAMP, under protocol # 442/2005. We assessed 44 male and female children in the age range of 8 to 14 with non-syndromic cleft lip and palate and/or palate cleft,

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