

OCCURENCE OF UNILATERAL HEARING LOSS IN PATIENTS WITH CLEFT LIP AND PALATE

Ocorrência de perda auditiva unilateral em pacientes com fissura labiopalatina

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ABSTRACT

Purpose: to investigate the occurrence of unilateral hearing loss in individuals with cleft palate. **Methods:** a retrospective study of 500 medical records of patients with cleft palate. **Results:** 55 subjects have been raised with unilateral hearing loss, 27 (49.1%) were male and 28 (50.9%) were female, mean age of 14.6 years. Eighteen (32.73%) had hearing loss in right ear and 37 (67.27%) in the left ear. Being 72.73% (40 subjects) with conductive hearing loss, 18.18% (10 subjects) sensorineural and 9.09% (5 subjects) of mixed type. Regarding the degree of hearing loss was found higher incidence of mild hearing loss. **Conclusion:** a unilateral hearing loss was more frequent in subjects aged 0-11 years, with equal gender ratio. A unilateral hearing loss may affect social and emotional aspects of the subject, leading him to need an intervention.

KEYWORDS: Cleft Lip; Cleft Palate; Hearing Loss, Unilateral

■ INTRODUCTION

Hearing problems can be composed in an isolated clinical case or be presented in association with other changes. Between the hearing-related changes found, are emphasized cleft lip and palate (CLP)¹.

Congenital cleft lip and palate are developed conspicuous in the face, during embryonic and early fetal stage, being presented, clinically, by the absence of closure of lip, palate or both².

There are several systems used to classify and describe the anatomical type of cleft. The Spina system³ is the most used one, and it is based on

the location of the lesion in relation to the incisive foramen. The pre-foramen cleft affects lip and alveolar arch and can be unilateral or bilateral. The post-foramen cleft affects hard palate and soft palate and can be unilateral or bilateral. Clefts that affect both pre-foramen and post-foramen areas are called transforaminal.

The subject with cleft lip and palate may present speech, dental, orthodontic and emotional problems. Thus, the characterization of the phonoaudiological signs and symptoms, the search for etiological diagnosis and finding clinical entities affecting the subject with cleft lip and palate have been concerns of healthcare professionals.

In children with CLP, the most frequent hearing-related change is otitis media, due to anatomical and/or functional malformations of the eustachian tube and the pharyngeal sphincter (PS) region¹.

Hearing loss due to otitis involves the most frequent loss found in this group and can be responsible of delayed acquisition of language, cognitive and psychosocial development⁴.

Hearing loss is the reduction of hearing in any degree that reduces the intelligibility of the spoken message for accurate interpretation or learning⁵.

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Any type of hearing loss can compromise language, learning, cognitive development and social inclusion of children.

Unilateral hearing loss can be responsible for academic difficulties, speech and language changes and social and emotional difficulties⁶, is characterized by decreased hearing in only one ear and occurs, mostly, in males⁷.

The unilateral hearing loss effects are smaller than those caused by bilateral loss, however can also cause problems. In the presence of ambient noise, individuals with unilateral loss face greater difficulties than normal hearing to understand speech, even when the better ear is positioned towards speech. Furthermore, the spatial location of sound sources is compromised⁸.

Therefore, knowing that cleft palate is an important craniofacial anomaly in the clinical reality and that according to the *Joint Committee on Infant Hearing*⁹ craniofacial anomalies are listed as one of the risk factors for hearing, Speech Language Pathologists, as well as having knowledge of present otologic complications determinants, have to be able to evaluate the whole auditory system thus contributing to the preventing process, therapy and the establishment of suitable conducts¹⁰.

For its significant consequences for the individual's overall development, unilateral or bilateral hearing losses, among communication disorders, have been emphatically studied under various aspects and in different populations. Unilateral hearing loss is not commonly found in patients with CLP.

The purpose of this research was to investigate the occurrence of unilateral hearing loss in individuals with cleft lip and palate.

METHODS

A retrospective study of 500 medical records of patients with CLP enrolled in Hospital for Rehabilitation of Cranial Anomalies – HRAC/USP. The records were randomly selected from a list provided by the Central Data Processing of HRAC.

All subjects included in this study showed no genetic syndrome associated and had undergone to otologic microsurgery.

The medical records were checked data pertaining to gender, cleft type, audiologic evaluation and age at the time of the exams.

For describing the type of cleft, it was used the Spina system et al (1972):

- Incisive trans-foramen cleft: it is a congenital cleft, unilateral or bilateral, including lip, dental arch, hard palate and soft palate, up to the uvula, promoting total communication between

the nasal and oral cavities. It can be unilateral or bilateral.

- Incisive post-foramen cleft: it is always median and located posterior to the anterior palatine foramen. Its degree can vary in width and length, which can be incomplete, when there is only soft palate and/or uvula impairment, or complete, when the cleft reaches the anterior palatine foramen, compromising the hard palate. This kind of cleft promotes communication between the posterior nasal cavity and oral cavity in greater or lesser degree.
- Post-foramen cleft: it can be unilateral or bilateral, complete or incomplete. When complete, the cleft begins in the anterior palatine foramen and reaches the anterior section of the palate, the alveolar arch at the level of the lateral incisor and canine teeth, nasal floor and upper lip. When incomplete, may be characterized by a notch in the lip vermilion, or by a lip impairment, or by lip and nasal floor impairment, with or without cleft alveolar arch, in a variety of forms.
- Submucous cleft palate: it is a variant of the post-foramen cleft, in which there is no continuity of the musculature in both sides of the midline, with the oral and nasal mucous sections integrate.

Hearing loss type was classified according to Santos and Russo (1993)¹¹:

- Conductive hearing loss: lowered tone thresholds for air conduction and normal thresholds for bone conduction, with a *gap* between air and bone conduction of at least 15 dBNA, and altered tympanometric measures.
- Sensorineural hearing loss: lowered tone thresholds for air and bone conduction, with no *gap*, and tympanometric measures, within the normal range.
- Mixed hearing loss: lowered tone thresholds for air and bone conduction, with or without variable *gap*, at different frequencies in the same ear. Tympanometric results can show the magnitude of the conductive component.

Hearing loss degree (HL) was classified using the audiometric frequencies of 500, 1000, 2000, 3000 and 4000 Hz: mild HL (average 26-40 dBNA), moderate HL (average 41-60 dBNA), severe HL (average 61-80 dBNA) and deep HL (average above 81 dBNA), according to WHO¹².

The normality criterion for children, aged 0 to 11 years old, was adopted according Northern and Downs¹³, regarding normal hearing thresholds from 0 and 15 dB.

Tympanogram configuration was classified according to Jerger¹⁴:

- Type A: maximum compliance peak around the air pressure of 0 daPa, whose variation does

not exceed -100 daPa, frequently found in individuals with normal middle ear function.

- Type B: maximum compliance peak in no air pressure, showing flattened and unalterable curve. Frequently indicates presence of fluid in the middle ear, usually associated with serious otitis media, or may represent a perforation of the tympanic membrane.
- Type C: displaced maximum compliance with negative pressure, below -100 daPa, found in individuals with malfunction of the eustachian tube.
- Type Ar: shows low compliance and stiffness, may be found in individuals with otosclerosis tympanosclerosis.
- Type Ad: usually represents a very mobile or highly compliant middle ear system, although, it might mean a very flaccid tympanic membrane and not necessarily a disjunction of the ossicular chain.

All patients in this sample treat and follow their specific craniofacial malformation and systematic monitoring of Otorhinolaryngology and Speech, Language and Hearing Sciences in a hospital specialized in craniofacial abnormalities and hearing impairment.

The procedures for patient selection started after approval by the Research Ethics Committee (Protocol 055/2003).

After completing data collection, it was performed a descriptive analysis of the results, which are presented in charts for ease of analysis and interpretation.

■ RESULTS

Were analyzed medical records of 27 (49.1%) male patients and, 28 (50.9%) female, average age of 14.6 years old (Chart 1).

The type of cleft was classified according to the Spina criteria, results shown in Chart 2.

Table 1 – Sample distribution according to age group

Age group	N (%)
0 to 11 years	26 (47.27%)
12 to 20 years	14 (25.46%)
21 to 40 years	15 (27.27%)
Total	55 (100%)

Table 2 – Sample distribution according to cleft type

Cleft type	N (%)
Complete incisive post-foramen	05 (09.09%)
Incomplete incisive post-foramen	06 (10.91%)
Complete unilateral incisive pre-foramen	01 (01.82%)
Incomplete unilateral incisive pre-foramen	03 (05.45%)
Complete bilateral incisive pre-foramen	01 (01.82%)
Incomplete bilateral incisive pre-foramen	01 (01.82%)
Unilateral incisive trans-foramen	26 (47.27%)
Bilateral incisive trans-foramen	10 (18.18%)
Submucosa	02 (03.64%)
Total	55 (100%)

Among 55 subjects, 18 (32.73%) showed hearing loss in the right ear and 37(67.27%) in the left ear, 72.73% (40 subjects) with conductive hearing loss, 18.18% (10 subjects) sensorineural and 9.09% (5 subjects) with mixed type.

Regarding the degree of hearing loss it was found higher occurrence of mild hearing loss (Chart 3).

Subjects showed higher incidence of curve type B in tympanometric configuration (Chart 4).

Table 3 – Sample distribution according to hearing loss degree

Hearing loss degree	N (%)
Mild	33 (60.00%)
Moderate	20 (36.36%)
Severe	2 (3.64%)
Total	55 (100%)

Table 4 – Sample distribution according to configuration of tympanogram

Configuration of tympanogram	N
Type A	18 (32.73%)
Type B	23 (41.81%)
Type C	08 (14.55%)
Type Ar	01 (01.82%)
Not evaluated	05 (09.09%)
Total	55 (100%)

In five (9.09%) records were not found results of tympanometria, as an individual had perforated tympanic membrane, two had undergone a tympanomastoidectomy and two evaluations were not performed due to technical problems with the equipment.

■ DISCUSSION

After collecting 500 medical records, it was found that 281 (56.20%) subjects showed bilateral normal hearing and 219 (43.8%) hearing loss, in which 164 (32.80%) bilateral, compatible with the literature^{15,16}. Unilateral hearing loss had been shown in 55 (11%) subjects, this being a new data concerning patients with CLP.

Regarding demographic distribution as to the gender of the subjects, focusing on records that show a unilateral hearing loss, there was an assimilation of both for this variable.

Regarding age, prevalence concentrated age 0 to 11 years, what may be due to the fact that nowadays the treatment for cleft lip and palate had been followed by an overall diagnosis, including audiological, what makes hearing loss diagnosable during childhood.

Unilateral trans-foramen cleft was most evident with 47.27% of the population, compatible with several research results, which showed a prevalence of 70%¹⁷, 47.9%¹⁸ and 66.2%¹⁹ on the studied samples.

It was shown that unilateral hearing loss incidence was concentrated in the left ear (67.27%)

at odds with a study regarding unilateral hearing loss that was prevalent in the right ear²⁰.

Conductive hearing loss was found in 72.73% of the sample, results aligned to researches with cleft patients^{1,21}.

Tympanogram type B indicates the presence of fluid in the middle ear, due to inflammation and presence of secretory otitis media, common among patients with CLP¹. In this research, it was found that 41.81% of the participants showed this configuration, although, type A tympanograms, indicating normal middle ear function was also found in 32.73% of the population sampled in this work.

Only eight subjects showed type C tympanometric curve, not typically found in patients with cleft lip and palate²², which shows a highly negative pressure in the middle ear and may indicate a transition between a normal ear and an ear filled with fluid²³.

Regarding the degree of hearing loss, there was prevalence of mild hearing, result similar to a characterization study of the hearing of 119 children from the city of Itajaí / SC, which found higher incidence of mild hearing loss and 63.4% unilateral hearing loss²⁴.

Hearing loss in childhood, even mild, brings learning difficulties. Children with mild hearing loss may present problems in language development, reading disabilities and behavioral disorders.

Speech, Language and Hearing Sciences needs studies that contribute to diagnosis of unilateral hearing loss, so there is a proper, early intervention for this type of hearing loss.

It is known that children with CLP show changes in essential abilities to the learning process^{21,25,26} such as socialization difficulties, speech changes and, in some cases, hearing changes due to its own cleft. The consequence usually is the learning failure frequently found in these children.

■ CONCLUSION

Unilateral hearing loss was shown, although in lower incidence, with prevalence of conductive type, in children aged 0 to 11 years, with equal gender proportion. The most found cleft type was unilateral incisive trans-foramen cleft.

RESUMO

Objetivo: investigar a ocorrência da perda auditiva unilateral em indivíduos com fissura labiopalatina. **Métodos:** estudo retrospectivo com 500 prontuários de pacientes com fissura labiopalatina. **Resultados:** foram levantados 55 sujeitos com perda auditiva unilateral, 27(49,1%) do gênero masculino e, 28 (50,9%) do gênero feminino, com média de idade de 14,6 anos. Dezoito (32,73%) apresentaram perda auditiva na orelha direita e 37(67,27%) na orelha esquerda, 72,73% (40 sujeitos) com perda auditiva do tipo condutiva, 18,18% (10 sujeitos) do tipo neurossensorial e 9,09% (5 sujeitos) do tipo mista. Quanto ao grau da perda auditiva foi constatada maior ocorrência de perda auditiva de grau leve. **Conclusão:** a perda auditiva unilateral foi mais frequente nos indivíduos com faixa etária de 0 a 11 anos, com igual proporção em gênero. A perda auditiva unilateral pode comprometer aspectos sociais e emocionais do sujeito, levando-o a necessitar de uma intervenção apropriada.

DESCRIPTORIOS: Fenda Labial; Fissura Palatina; Perda Auditiva Unilateral

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