TEMPOROMANDIBULAR JOINT DYSFUNCTION AND ITS CORRELATION WITH AUDITORY TUBE IN CLEFT PALATE PATIENTS

A relação entre disfunção temporomandibular e disfunção tubária em pacientes com fissura palatina

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ABSTRACT

Purpose: investigate the existence of dysfunctional temporomandibular disorders, and as a predisposing factor to investigate tubal dysfunction in patients with cleft palate. **Method:** 10 individuals (20 temporomandibular joints), operated of cleft palate had been evaluated, that were in treatment in the Clinical Center of Fonoaudiologia of the PUC-MG, with age varying between 8 and 18 years, of both gender, and that they presented history of middle otitis in first infancy. The same ones had been submitted to the meatoscopia, imitanciometria, research of the tube function, examination of feel of the face muscle and examinations of image (x-rays transcraniana in 6 positions and *AP of Town*). Being compared for the Accurate Test of Fisher ($p<0,05$). **Results:** it was observed that the majority of the sample presented of auditory tube dysfunction, when analyzed for the test of the tube function corresponding 80% of the total. In relation to the joint to temporomandibular nine individuals (90%) they had not presented dysfunction and only one individual (10%) got, observed in the examinations of image, presence at the back of condyle process of the left side. **Conclusions:** as preliminary data, when analyzing the temporomandibular joint dysfunction and its correlation with auditory tube, the Accurate Test of Fisher did not find resulted significant, evidencing that the joint to temporomandibular of the cleft palate patients, does not suffer alterations proceeding from the inefficient functioning from auditory tube.

KEYWORDS: Cleft Palate; Otitis Media; Temporomandibular Joint Dysfunction Syndrome; Eustachian Tube

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INTRODUCTION

Individuals with cleft palate have changes in the anatomy of the muscles attached to the median raphe of the palate, which causes the muscles responsible for their upper and lower movement lose their fixation, therefore not exercising the adequate traction on the velum[1].

Casselbrant et al., in 1985, conducted a study in individuals with cleft palate, from computed tomography and image reconstruction in three dimensions, showed that the tensor and levator muscles of the soft palate function synergistically opening and dilating the Eustachian tube[2]. This study reveals that the fibers of these muscles follow parallel to the anatomy of the Eustachian tube and in the case of

individuals with cleft palate, fall into the area of cleft palate[2].

The abnormal insertion of the levator muscles and tensor veli palatini, present in this type of cleft, can vary from a mild degree to a more significant degree one. In the presence of altered muscle palate may occur a reduced tubal functioning[1].

The Eustachian tube, the structure that connects the nasopharynx to the tympanic cavity of the middle ear consists of three parts: cartilage, medial and bone. The proximal portion also called cartilage ends in the nasopharynx. The bone or the distal portion communicates with the anterior portion of the middle ear, since it is located in the petrous part of temporal bone. The medial portion refers to the part of the Eustachian tube that connects the cartilaginous portion of the bone[3,4]. Responsible for the drainage and aeration of the tympanic cavity, the Eustachian tube allows the balance of air pressure in the middle ear, while it replenishes absolved oxygen[4]. Also, it protects against middle ear secretions, pathogens, pressure variations and sounds from the nasal pharynx. The Eustachian tube also has the function through the mucociliary system, eliminating fluids, debris, and foreign substances in the middle ear[4].

Individuals with cleft palate are then more prone to functional obstruction of the Eustachian tube, as the responsible muscles for opening and dilation behave in this inefficient way[5]. The persistence of negative pressure in the middle ear can be a triggering factor for sterile otitis media with effusion[2,5]. There is evidence that patients with cleft lip and palate have several complaints about the ear, nose and throat[5]. The presence of serous otitis media is considered almost universal in patients with cleft palate[2,6-10].

Studies show changes in tympanometric curves of individuals with cleft palate. In these, it was possible to verify in most cases, tympanometric curve type B and C, suggesting the presence of hearing alterations resulting from problems in the middle ear[5].

Temporomandibular disorders constitute of a set of signs and symptoms such as pain, presence of crackles, clicking or even inflammation in the region of the temporomandibular joint (TMJ)[11,12]. Cervical tension and shoulder girdle also bind to this type of dysfunction[13].

Joint changes present in temporomandibular disorders are described and related mainly in adult patients, probably due to the high incidence in this population[11]. However, these changes can also occur in children. Generally the presence of joint in children is related to the history of tube dysfunction and otitis media in early childhood[11].

The mandibular fossa during childhood and adolescence presents a framework called tympanosquamous fissure, which remains open until the individual reaches the bone maturation[12]. It is believed that the opening present in articular fossa allows the passage of fluid from the middle ear and mastoid to the joint region of the temporomandibular joint[11], and that there is a link between the stomatognathic system and the auditory system, which can be causes and consequences of temporomadibular dysfunctions[14,15].

As individuals with cleft palate exhibit significant possibility of developing otitis media with effusion[16], the present study aimed to investigate the existence of temporomandibular disorders, having as a predisposing factor the tube dysfunction.

METHOD

We selected 28 individuals who operated cleft palate, aged from 4 to 20 years old, and were undergoing treatment at the Phonoaudiology clinic at PUC Minas, and had a history of otitis media in early childhood. However, only 10 individuals agreed to participate in all the steps required for this research. Thus, the sample consisted of 10 subjects, five male and five female, with age range from 8 to 18 years old. So it was searched 20 temporomandibular joints and 20 tubal regions.

The sample subjects were assessed using the following tests:

- Meatoscopy: Through the TK otoscope it was investigated possible presence of wax plugs and/or foreign bodies in the ear canal;
- Immittanciometry: through AZ7 immittanciometer, it was assessed as the tympanum-ossicular system behaves at the sound;
- Research of the Tubal Function: Carried through the AZ7immittanciometer, this aimed to analyze the functioning of the Eustachian tube.
- Examination of the temporomandibular joints and associated musculature: In this study it was used the Specific Protocol of Orofacial Pain and Temporomandibular Disorders, based on research diagnostic criteria for temporomandibular joint disorders (RDC / TMD)[17] and aims to investigate the presence of muscle pain, stress points, popping and/or mandibular deviation.
- Imaging examinations: Through Oralix equipment, Gendex-(70 kvp 10mA) and Rotograph Dhabi Atlantis (80 Kvp 10mA), it was possible to perform transcranial radiography in six positions and Town's Ap, able to show the conditions of the temporomandibular joint (TMJ).

This study was approved by the Ethics in Research Committee of PUC Minas CAAE 0219.0.213.000-05.

Data were tabulated and analyzed using the Fisher exact test with a significance level of 5%.

RESULTS

In the studied sample, it was not verified the presence of foreign body and or wax plug during otoscopy, which made possible the realization of reliable audiological tests.

Considering the 10 analyzed patients, having as parameter 20 ATMs and 20 ears, it was observed sixteen ears with Eustachian tube dysfunction and absence of temporomandibular dysfunction, as it was verified temporomandibular dysfunction with no tube dysfunction. Three ears and ATMs did not change (Table 1).

Table 1 - Relationship between temporomandibular disorders and tubal dysfunction

TUBAL DISFUNCTION	TEMPOROMANDIBULAR DISORDER		Total
	Present	Absent	
Present	0	16	**16**
Absent	1	3	**4**
Total	**1**	**19**	**20**

Fisher's Exact Test. P = 0,2 (p< 0,05)

By analyzing the relationship between tube dysfunction and temporomandibular dysfunction, the Fisher exact test found no significant results, showing that the temporomandibular joint of individuals with cleft palate does not change from the inefficient functioning of the Eustachian tube.

DISCUSSION

It was observed in this study, that most of the sample had Eustachian tube dysfunction. This finding is consistent with other studies that show the inefficiency of the tensor muscles and elevator of the veil palate in patients with cleft palate, to play the role of opening and dilating the Eustachian tube[1].

Study, using computed tomography and image reconstruction in three dimensions, showed that the anatomy of the Eustachian tube of individuals with cleft palate is different from tube anatomy of normal individuals. According to this work, the Eustachian tube of the fissured individuals, suffers a slight deviation in its caudal portion, which may hinder its function[3]. This fact can be considered significant in regard to the performance of the sample tube in the study of the tube function.

Some authors claim that the persistence of negative pressure within the middle ear due to the inefficiency of the Eustachian tube function of patients with cleft palate, can cause changes in the middle ear[2,5]. Studies have shown that the presence of otitis media is almost universally considered in this population. According to other authors, the incidence of otitis media in subjects with cleft palate, from 50% to 90% of the cases, this is 30 times more frequent than in normal populations, as well as in individuals with only lip fissure[6-10]. Our work is in line with these studies, as all individuals in the sample reported a history of otitis media in early childhood.

Audiological findings obtained from our sample, showed that the vast majority of patients had changes in the middle ear, and found both tympanogram type C and type B. This result correlates with the findings in the literature since tympanometric studies claim that it can be seen in most cases of cleft palate, tympanogram type B or C, suggesting the presence of middle ear disease in these[5].

Some authors claim that the growth and maturation is not complete until the second decade of life[11-13]. Another study shows that the mandibular fossa during childhood and adolescence presents a framework called tympanoescamosa fissure, which remains open until the individual reaches the maturation[12]. It is believed that this opening in the fossa allows the passage of fluid in the middle ear and mastoid to the temporomandibular joint[11].

Since individuals with cleft palate are more likely to experience otitis media with effusion, and the vast majority of this sample had abnormal middle ear, it would be expected that these disorders present in the temporomandibular region[14]. However, imaging studies and the clinical evaluation of ATM revealed that almost all individuals in the sample had no complaints, signs and symptoms related to TMJ

disorders. This fact leads us to believe that this secretion in the middle ear of these individuals during infancy, had no way to drain timpanoescamosa fissure.

Only one individual in our sample complained of pain in the neck, limitation of opening and popping chewing. The imaging examination revealed a posterior condyle of the left side. However, this individual did not show tube dysfunction, which leads us to suppose that the cause of temporomandibular dysfunction of this individual would possibly be associated with other aspects.

Temporomandibular dysfunction has as an etiology several factors such as: stress, psychological disorders, harmful habits, malocclusion, among other causes[13]. One should not think of the Eustachian tube dysfunction as a common cause of TMJ disorders, but as a possible predisposing factor for developing this.

CONCLUSION

From the results of this study, it was found that the tube dysfunction present in individuals with cleft palate is not a triggering factor for TMJ dysfunction.

RESUMO

Objetivo: investigar, em indivíduos com fissura palatina, a existência de disfunções temporomandibulares, tendo como fator predisponente a disfunção tubária. **Método:** foram avaliados 10 indivíduos (20 articulações temporomandibulares), operados de fissura de palato, que estavam em tratamento no Centro Clínico de Fonoaudiologia da PUC Minas, com idade variando entre 8 e 18 anos, de ambos os sexos, e que apresentavam história de otite média na primeira infância. Esses foram submetidos à meatoscopia, imitanciometria, pesquisa da função tubária, exame de palpação da musculatura orofacial e exames de imagem (radiografias transcraniana em seis posições e *Ap de Town*). **Resultados:** foi observado que a maioria da amostra apresentava disfunção da tuba auditiva, correspondendo a 80% do total. Em relação à articulação temporomandibular nove indivíduos (90%) não apresentaram disfunção, em apenas um indivíduo (10%) foi verificado presença de desordem temporomandibular. **Conclusão:** ao analisar a relação entre a disfunção tubária e disfunção temporomandibular, não foram observados resultados significantes de acordo com o Teste Exato de Fisher, evidenciando que a articulação temporomandibular dos fissurados de palato, não sofre alterações provenientes do funcionamento ineficiente da tuba auditiva.

DESCRITORES: Fissura Palatina; Otite Média; Síndrome da Disfunção da Articulação Temporomandibular; Tuba Auditiva

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