



ARTÍCULO DE INVESTIGACIÓN

PREVALENCE OF TONGUE ALTERATIONS IN A GROUP OF PATIENTS WITH DOWN SYNDROME.

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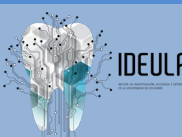
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PREVALENCE OF TONGUE ALTERATIONS IN A GROUP OF PATIENTS WITH DOWN SYNDROME.

ABSTRACT

Introduction: The patient with Down Syndrome DS frequently presents tongue alterations. The most common are fissured tongue and macroglossia. The prevalence percentages in both cases are important and both conditions could be decisive in the development of reactive lesions. **Methods:** It was controlled cross-sectional study, conducted in May 2018 in a Special needs school “Apoye” located in Caracas. 35 children with DS were included. Demographic data such as age and gender were recorded and the presence of macroglossia, fissured tongue, geographic tongue and irritation fibromas. **Results:** DS had a high prevalence of macroglossia (40%) and fissure tongue (65.7%). Conversely, geographic tongue and irritation fibroma were found in 5.7% and 11.4% respectively. Geographic tongue was similar in both males and females. However, Macroglossia, Fissured tongue and traumatic fibroma were more prevalent in females. There were statistical significant between macroglossia and traumatic fibroma ($p = 0.019$) and the presence of macroglossia and fissure tongue ($p = 0.010$). **Conclusions:** Fissured tongue and macroglossia are the most prevalent alterations in DS patient. It is important to identify the factors associated with them early in order to design corrective measures and avoid future complications.

Keywords: Down syndrome, fissured tongue, macroglossia, geographic tongue, traumatic fibroma.



INTRODUCTION

The Down Syndrome DS, also known as par 21 trisomy, is a genetic alteration in which there is an extra chromosome in all the individual's cells^{1,2}. This is consider the most prevalent chromosomal disorder and the incidence is influenced by maternal age and differs in population (between 1 in 319 and 1 in 1000 live births)^{2,3}.

Patients with DS typically have multiple organ or system involvement^{1,4}, neurological alterations, generalized hypotonia, cardiopathies, respiratory problems and craniofacial alterations, among others are frecuentes¹. The oral cavity shows certain findings that are common in this population, being the tongue one of the most affected anatomical areas, so for example the presence of fissures in the dorsal face and macroglossia are among the most prevalent findings⁵, also frequently reported, benign migratory glossitis and traumatic fibroma.¹.

In the patient with DS, non-pathological conditions of the tongue are common, both benign migratory glossitis and fissure glossitis. However, the latter is much more frequent; in fact, it is considered one of the most common oral disorders in the Down's patient, with most studies reporting a prevalence of over 60% of cases^{2,6,7}, even seems to be more common than in the general population and has been observed to increase with age¹. These non-pathological conditions can sometimes be present concomitantly and generally do not produce symptoms. When referred by the patient, it is usually a case of burning from the consumption of certain foods and in the special of a fissured tongue, there are reports of halitosis^{7,8}.

Macroglossia is also a common disorder in the oral cavity in these patients. Studies of different populations mostly handle percentages exceeding 40%⁷. There are congenital conditions associated with this alteration, such as the presence of vascular malformations or congenital hypothyroidism and there are factors that are related to a relative macroglossia such as, the hipoplasia of the jaws that are part of the craniofacial alterations in this population, the tendency to keep the tongue in a



lower position and at rest, in addition to the early loss of jaw structures that is common in these patients due to severe periodontal involvement².

There are several consequences inherent to the presence of macroglossia in the Down's patient, being the malocclusion one of the most important, for example the anterior open bite is very common as well as the displacement of teeth by the force of the tongue in the dental arch with the consequent development of diastema and additionally all these factors have a significant impact on the temporal-mandibular joint in this population².

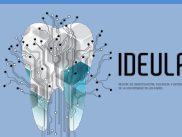
Several studies that seek to determine the oral status of patients with DS have reported the presence of traumatic fibromas^{4,7}, this pathology of reactive character is common in the edges and lingual dorsum, being related in these patients to the macroglossia, being inevitable the trauma and friction since the tongue extends beyond the limits of the dental arches⁹.

Given that the tongue is a frequent source of disorder in DS patients, it is important to know how they behave in this population and to understand their impact on oral health in order to design the best work plan. In this context, the aim of this study was to determine the prevalence of tongue disorder in a group of individuals with DS.

MATERIALS AND METHODS

This controlled cross-sectional study, conducted in May 2018 in a Special needs school "Apoye" located in Caracas. We included 35 children with Down syndrome. The inclusion criteria implemented were: diagnosis of trisomy 21, adequate cooperation from the children, and obtainment consent from the children's parents. The exclusion criterion was an extremely uncooperative children.

Bioethical approval was granted by the Bioethics Committee of the Faculty of Dentistry, Santa María University, Caracas. Informed consent was obtained from the parents and the school authorities before the subjects were included in the study.



Demographic data such as age and gender were recorded. All patients were examined by one single operator, specialized in Oral Medicine with the help of a mirror, gauze and wooden tongue depressor under artificial light, evaluating for the presence of macroglossia, fissured tongue, geographic tongue, and traumatic fibromas.

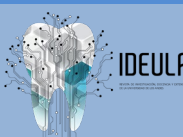
The results were evaluated statistically with IBM SPSS software version 20.0 (IBM Corporation, New York, USA) with a descriptive analysis including percentages and frequencies for categorical data and means and standard deviations for numerical data. Statistics Fisher's exact test was used with quantitative variables. A 5% confidence level was used, taking $p < 0.05$ values as statistical significance.

RESULTS

A total of 35 DS patients were evaluated. The age group was between 9 and 46 years with a mean of 24.77 ± 8.59 and a median of 25. The most prevalent gender was females with 77.1% (27 girls) while males represented 22.9% (8 boys). (Table 1)

Table 1. Demographic data

Variable	Down Patients N° (%)
Gender	
Male	8 (22.9%)
Female	27 (77.1%)
Age (mean)	24.77
Age Categories	
9-17 years	9 (25.7%)
18-27 years	12 (34.2%)

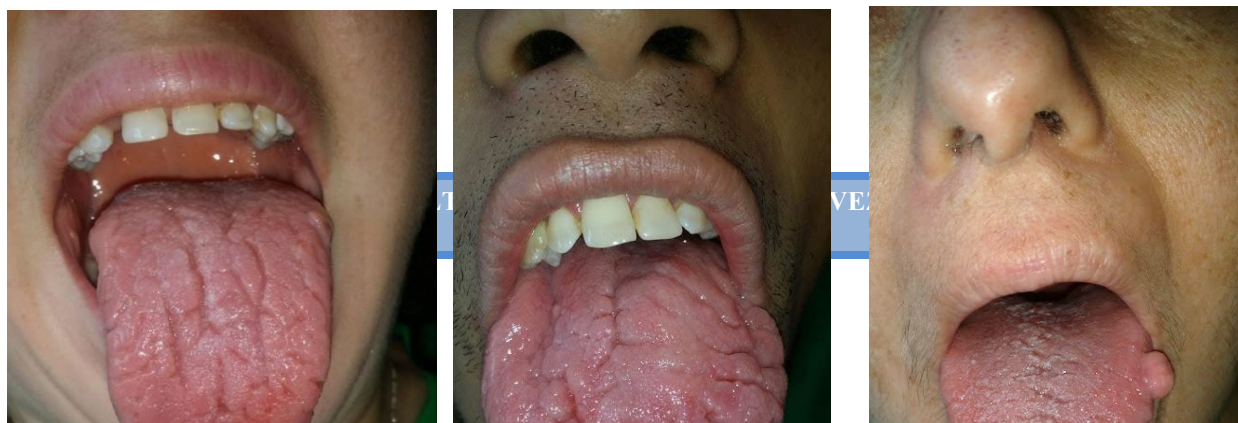


28-37 years	12 (34.2%)
38-46 years	2 (5.71%)

As shown in table 2 patients with DS had a high prevalence of macroglossia (40%) (Fig 1) and fissure tongue (65.7%) (Fig 2). Conversely, geographic tongue and traumatic fibroma (Fig 3) were found in 5.7% and 11.4% respectively. Two cases were located on the lateral edge of the tongue and the other two on the back.

Table 2. Prevalence of tongue lesions in Down syndrome patients

Tongue Condition	Patients
Fissured tongue	23 (65.7%)
Macroglossia	14 (40%)
Traumatic fibroma	4 (11.4%)
Geographic tongue	2 (5.7%)



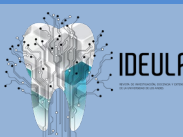


Fig 1. Macroglosia

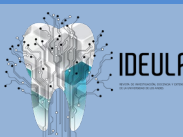
Fig 2. Fisured tongue

Fig 3. Traumatic fibroma

Gender-wise comparison showed that geographic tongue was similar in both males and females. However, Fissured tongue, Macroglossia and Irritation fibroma were more prevalent in females. There was no statistical significance between both groups. (Table 3)

Table 3. Distribution of the tongue lesions among Down syndrome patients according to gender

Tongue Condition		Gender			
		Males	Females	%	<i>p</i>
Fissured tongue	present	6	17	65.7	0.685
	absent	2	10	34.3	
Macroglossia	present	5	9	40	0.221
	absent	3	18	60	
Traumatic fibroma	present	1	3	11.4	1.000
	absent	7	24	88.6	



Geographic tongue	present	1	1	5.7	0.410
	absent	7	26	94.3	

According to age category, in the first group (9-17 years), 5 patients that represent the 55.55% of that category had fissured tongue. In the second group, 66.6% presented this condition. The category of 28-37 years had the higher prevalence with a 75% of the patients. In the last group, 50% was the prevalence found (Table 4).

Table 4. Patients with fissured tongue in each age category.

Age Categories	Patients with fissured tongue	Percentage for age categories
9-17 years	5	55.5%
18-27 years	8	66.6%
28-37 years	9	75%
38-46 years	1	50%

The results showed that There was no correlation between the presence of fissured tongue and traumatic fibroma ($p= 1.00$) and fissured tongue with geographic tongue ($p= 1.00$). Nevertheless, we found statistical significant between macroglossia and traumatic fibroma ($p = 0.019$) and the presence of macroglossia and fissure tongue ($p = 0.010$).

DISCUSSION

DS is the first cause of intellectual disability worldwide. As literature report, these patients have many medical and oral conditions associated. Specifically, oral alterations are very common in DS patients like tongue alterations and they are the cause of the consultation of many patients. For that reason, it is very important to study the prevalence and the specific manifestations that these



patients could show, in order to be preparing to offer them the right treatment to improve their life quality.

In the present study, four tongue lesions were identified among the study subjects. The most common prevalent lesions were fissured tongue, macroglossia and the less prevalent were geographic tongue and traumatic fibroma.

The most prevalent alteration was the fissured tongue (65.7%) which is similar to the results obtained by Ghaith et al⁷. who reported a prevalence of 67.9%, Al Maweri et al¹. reported 78% and Rahul et al⁶. with 78.6%. In contrast, Alyassiri et al¹⁰. found a lower prevalence of 25.4% and Daneshpazhooh et al⁴. with 28%.

Patients with fissured tongue are usually asymptomatic. However in some cases it can act as a bacterial reservoir and food debris causing halitosis^{7,11}. Its presence has been related to oral breathing, which is common in this population, causing dryness and cracking in the lingual dorsum mucosa¹², despite the fact that there is not enough evidence to correlate this factor to this condition, as can be observed in table 4, excluding the last age group with very few participants, it increases with age, as reported in Ercis et al⁵. and as shown in Asokan et al¹³. in his results. This behavior could well correspond to a progressive transformation of the lingual dorsal mucosa due to the chronic effect of drying and irritation due to oral breathing.

Very few cases of geographic tongue were observed in this study (5.7%). This is in agreement with other researchers like Daneshpazhooh et al⁴. who reported 4% and Ghaith et al⁷. 8.5%. Although there was no correlation in this study, many authors report an association between geographic and fissured tongue¹².

In the patient with DS, macroglossia is definitely a prevalent condition. Studies that compare special needs populations show that it is almost exclusive to the DS patient⁶. In our study, 40% of the sample had macroglossia. Prawidiastuti et al¹. showed that of 30 study subjects with DS in



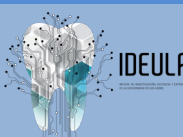
Indonesia there were 16 children (53.3%) who had macroglossia. A higher prevalence of 62.7% was reported by Asokan et al¹³.

Macroglossia could be relative in many cases due to some common characteristics in this population such as hypoplasia of the jaws, hypotonia of the tongue and premature loss of teeth that alter the arch and the limits necessary for the tongue maintains its size and normal position. They are determining for the development of this alteration. Nevertheless, other causes like inadequate lymphatic drainage or congenital hypothyroidism can be also associated¹².

The repercussions of macroglossia on Down's quality of life are significant, considering the inherent disorders of speech and how this further deteriorates his form of communication and social interaction. Other functional aspects such as respiratory disorders, difficulties in chewing, swallowing and tongue movements, with the consequent complications related to occlusion² are also relevant. In this sense, it is important to take into account the factors related to macroglossia to design a dental treatment plan that leads to correcting them and thus improving the associated functional and psychological aspects, in addition to considering other options such as language therapy, orthopedics or orthodontia.

Studies such as that of Al-Maweriet al¹ and Ghaith et al.⁷ showed the presence of traumatic fibroma in DS patients at 8% and 1% respectively. This finding was also observed in the present study (11.4%) in a slightly higher percentage. Their locations were side edge and dorsum of the tongue. The tongue, which is one of the oral areas most subjected to chronic friction by chewing, in these patients is even more accentuated if there is macroglossia, increasing the chances of developing a traumatic fibroma and whose correlation showed statistical significance in this study.

Although the fissured tongue and the presence of FT did not show a statistical significance correlation, it must be considered that this reactive lesion could be present in these patients even in the absence of macroglossia. In this sense, it is important to take into account that the fissures



in the tongue generate an irregular dorsal surface that could be traumatized by frequent etiological factors of FT that commonly appear in the DS patient, such as dental crowding and malocclusion.

CONCLUSIONS

Fissured tongue and macroglossia are the most prevalent tongue disorders in the DS patient. Macroglossia in particular can affect the quality of life of the patient, therefore it is important to identify the associated predisposing factors early in order to avoid the subsequent development of reactive lesions and other functional and social implications.

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