Revista ARACÊ
ISSN: 2358-2472

EVALUATION OF THE PREVALENCE AND SEVERITY OF PERIODONTAL DISEASE IN PATIENTS WITH CLEFT LIP AND PALATE

https://doi.org/10.56238/arev7n2-101

Submitted on: 10/01/2025 **Publication date:** 10/02/2025

Kaohana Thais da Silva[1], Leticia Nadal[2], Silvia W. Dal'Maso Taha[3], Carlos Augusto Nassar[4] and Patricia Oehlmeyer Nassar[5]

ABSTRACT

Cleft lip and palate (CLP) is the most common malformation diagnosed in the craniofacial region of live newborns, resulting from failures in the anatomical fusion of facial processes. From the periodontal point of view, in the region of the cleft, a very shallow vestibule, presence of scar bridles, inadequate amount of keratinized mucosa, longer conjunctive insertion, irregularities in the dental arch, poorly developed bone structures and gingival recessions in the teeth adjacent to the cleft can be observed, these changes affect the ability of patients to maintain adequate oral hygiene. Therefore, the objective of this study was to verify the prevalence and severity of periodontal disease in individuals with CLP. This is a study involving patients with CLP treated at the Center for Care and Research in Craniofacial Anomalies (CEAPAC) of the University Hospital of Western Paraná (HUOP/UNIOESTE), in Cascavel/PR. Patients were classified according to the type of cleft and in the clinical examination, the measurements of probing depth (SP), attachment level (NI), gingival index (GI), plaque index (PI), bleeding on probing (SS), width (LG) and thickness of keratinized tissue (TEQ). The mean age of the patients evaluated was 23.26 ± 9.64 years. In the assessment of family income, 53% reported receiving up to 1 minimum wage per person. The most prevalent type of cleft was that involving the lip, alveolus, and palate (LAP). In the evaluation of PI, GA, SS, ETQ, and GL, there were no statistically significant differences between the types of cleft or when comparing the cleft region with the lower arch. Regarding clinical SP and NI in the cleft region, patients with LAP cleft had a significant increase in the others. The teeth close to the cleft showed significantly higher PS and NI indices when compared to the lower arch. It was observed that periodontal disease in individuals with cleft lip and palate occurs similarly to other populations, and the presence of cleft lip and palate may be an aggravating factor for the prevalence and severity of the disease.

[1] Master of Dentistry
State University of Paraná - UNIOESTE - PR - Brazil
[2] Master of Dentistry
State University of Paraná - UNIOESTE - PR - Brazil
[3] Master of Dentistry
State University of Paraná - UNIOESTE - PR - Brazil
[4] Professor of Periodontics/Master's Degree in Dentistry State University of Paraná - UNIOESTE - PR - Brazil
PhD in Periodontics – UNESP – Araraquara
State University of Paraná - UNIOESTE - PR - Brazil
[5] Professor of Periodontics/Master's Degree in Dentistry State University of Paraná - UNIOESTE - PR - Brazil
PhD in Dentistry – UNESP – Araraquara
State University of Paraná - UNIOESTE - PR - Brazil

Revista ARACÊ
ISSN: 2358-2472

Keywords: Cleft Lip. Periodontal Diseases. Epidemiology.

Revista ARACÊ
ISSN: 2358-2472

INTRODUCTION

Cleft lip and palate (CLP) is the most common malformation diagnosed in the craniofacial region of live newborns (RĂDUCANU et al., 2015). The worldwide prevalence is 1.53 cases per thousand live births, and in Brazil, it varies from 0.19 to 1.54 per thousand live births. They result from failures in the anatomical fusion of facial processes, between the 4th and 12th week of gestation. The etiological factors pointed out are genetic, especially those related to the individual himself (mutations and polymorphism), which interact with environmental factors, such as nutritional deficiency, alcoholism, and smoking (ALMEIDA et al. 2017; YILMAZ, et al., 2019).

As a result, CLP is related to impairment of aesthetics, speech and hearing, dental, and even psychological problems. Treatment should be multidisciplinary and consider the particularities of this population (MACHOROWSKA-PIENIDHEK et al., 2017; PRASAD et al., 2019). It is known, among other aspects, that carriers commonly present characteristics such as maxillary atresia, severe maxillomandibular discrepancies, tooth malposition, supernumerary teeth, hypodontia, abnormalities in the shape of the teeth, and mucogingival alterations (RĂDUCANU et al., 2015; YANG et al., 2019).

The main reasons for treating patients with CLP are function and aesthetics. Good speech and the health of the stomatognathic system are therapeutic goals of treatment. Along with the above-mentioned goals, long-term tooth preservation should be important in patients with poor oral hygiene with a tendency to plaque retention, tooth malposition, primary crossbite, arch length deficiency, and periodontal trauma that contributes to the deterioration of periodontal health (NAGAPPAN and JOHN, 2015).

Periodontitis is a multifactorial chronic inflammatory disease associated with a dysbiotic biofilm and characterized by the destruction of the tooth support apparatus. Its main characteristics include loss of periodontal tissue support, manifested by loss of clinical attachment and alveolar bone loss evaluated radiographically, presence of periodontal pockets, and gingival bleeding. Periodontitis is an important public health problem due to its high prevalence, in addition to being able to lead to tooth loss and disability, negatively affecting masticatory and aesthetic function, being a source of social inequality, and impair quality of life (PAPAPANOU et al., 2018).

From the periodontal point of view, in the region of the cleft, a very shallow vestibule, presence of scar bridles, inadequate amount of keratinized mucosa, longer conjunctive insertion, irregularities in the dental arch, poorly developed bone structures

Revista ARACÊ
ISSN: 2358-2472

and gingival recessions in the teeth adjacent to the cleft can be observed, these changes affected the ability of patients to maintain adequate oral hygiene (ALMEIDA et al., 2012). Some studies also state that in the FLP region, there is greater development of periodontopathogenic bacteria (MACHOROWSKA-PIENIDHEK et al., 2017; MACHOROWSKA-PIENIDHEK et al., 2016). Thus, the risk of developing carious lesions and periodontitis is higher in patients with CLP, even before complete closure (NAGAPPAN and JOHN 2015).

There are few studies on periodontal conditions, especially those that evaluate all teeth and sites in the PFL carriers, so the prevalence and severity of periodontal disease in these individuals have not yet been well established. This knowledge is necessary to establish preventive and treatment programs according to the needs of this population or even to ascertain whether the cleft area is another risk factor for the establishment of periodontal disease.

Thus, considering the limitations and needs above, the objective of the present study was to verify the prevalence and severity of periodontal disease in individuals with CLP, as well as to establish whether there is a higher prevalence and severity of periodontal disease in the region of CLP and whether the different types of clefts can influence periodontal disease patterns.

METHODOLOGY

TYPE OF STUDY

This is a cross-sectional observational study where the clinical outcome was the prevalence and severity of periodontal disease involving patients with CLP, treated at the Center for Care and Research in Craniofacial Anomalies (CEAPAC) of the University Hospital of Western Paraná (HUOP/UNIOESTE), in Cascavel/PR.

ETHICAL ASPECTS

By Resolution 466/12 of the National Health Council, regarding research involving human beings, this study was evaluated and approved by the Human Research Ethics Committee of the State University of Western Paraná – UNIOESTE, under CAAE opinion: 04102018.2.0000.0107.

Revista ARACÊ
ISSN: 2358-2472

After approval by the Ethics Committee, the objective and nature of the study were explained to all patients, and they were then included as study participants after signing the informed consent form (ICF).

METHOD OF DATA COLLECTION

Sample Calculation

The sample size calculation was based on a pilot study using the Proportion Size Test with a power of 80% and a significance level of 5%, using the Bioestat 5.3 program, with a minimum of 8 patients per group being defined, where 21% of the patients had a cleft lip, 34% had cleft lip and alveolus, and 35% had cleft lip, alveolus, and palate.

Inclusion Criteria

Individuals, aged 13 to 60 years, with unilateral or bilateral cleft lip, alveolar ridge, and/or palate, of both genders, treated at the Center for Care and Research in Craniofacial Anomalies (CEAPAC) of the University Hospital of Western Paraná (HUOP/UNIOESTE), in Cascavel/PR.

Exclusion Criteria

The following individuals were excluded from the sample:

- Carriers of other congenital anomalies;
- With systemic changes;
- Users of upper or lower total dentures;
- Smokers;
- Pregnant;
- Ethyls;
- Users of any type of drug;
- Who is using antidepressants, anti-inflammatories, anticonvulsants, calcium blockers, or any other drug that may interfere with the results of this study?

Study design

During the clinical examination, anamnesis was performed to obtain information about each individual: age, gender, hospital ID number, general health, type of cleft, classification of socioeconomic level according to Graciano (1976), periodontal and

Revista ARACÊ
ISSN: 2358-2472

orthodontic history, among others, according to the form in the annexes. Several clinical parameters will also be evaluated to diagnose the periodontal situation of each individual.

Every patient enrolled in CEAPAC/HUOP has his cleft classified according to the classification recommended by SPINA modified by SILVA FILHO et al. (1992), which takes the incisor foramen as a reference point for its classification:

Group I – pre-foramen incisor fissures (fissures that extend anterior to the incisor foramen). Cleft lip with or without cleft lip ridge.

a) Unilateral: Complete or incomplete right

Complete or incomplete left

b) Bilateral (complete or incomplete)

c) Medians (complete or incomplete)

Group II – Transforamen incisor fissures

a) Unilateral (right or left)

b) Bilateral

Group III – Cleft after incisive foramen (clefts that are understood after the incisor foramen)

a) Total

b) Partial

Group IV – Rare clefts of the face

However, considering that the Spina classification is not universal, that is, it is not used in the international literature, in the results, discussion, and conclusion of this work, with a view to future publications, the patients were also classified by the FOGH classification – ANDERSEN (1942):

- Cleft lip with or without alveolar ridge cleft lip (LAE: left lip and alveolus, LAD: right alveolar lip and ridge, LAB: bilateral alveolar lip and ridge);
- Cleft lip and palate (LAPE: lip, alveolar ridge and left palate, LAPD: lip, alveolar ridge, and right palate, LAPB: lip, alveolar ridge, and bilateral palate);

Revista ARACÊ
ISSN: 2358-2472

Fig. 1 – Cleft lip and left alveolar ridge (LAE)

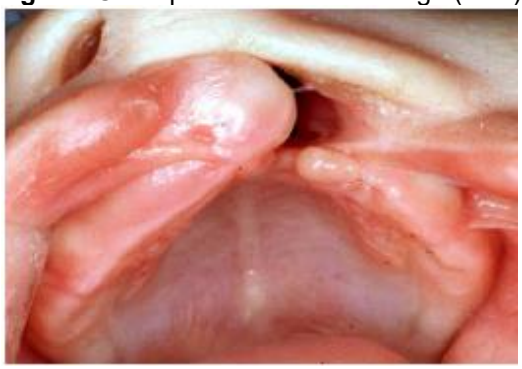


Fig. 2 - Cleft lip and bilateral alveolar ridge (LAB)

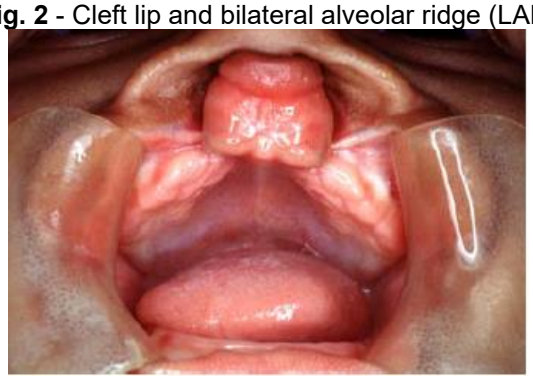


Fig. 3 – Cleft lip, alveolar ridge and left palate (LAPE)

Fig. 4 – Cleft lip, alveolar ridge and bilateral palate (LAPB)

Next, the following clinical parameters were analyzed:

Revista ARACÊ
ISSN: 2358-2472

1- Measurement of the Probing Depth of the Periodontal Groove or Pocket (PS): Measurement of the gingival margin at the base of the gingival sulcus/periodontal pocket. Six sites will be analyzed in all teeth (mesiobuccal, vestibular, disto-vestibular, mesiolingual, lingual, and disto-lingual), except the third molars.
2- Clinical Attachment Level (NI) Measurement: Measurement of the cementary junction at the base of the gingival sulcus/periodontal pocket. As with the probing depth, six sites per tooth will be evaluated (media-vestibular, vestibular, disto-vestibular, mesiolingual, lingual, disto-lingual), except the third molars
3- Evaluation of the Gingival Index: Gingival Index (GI) of LÖE & SILNESS: dichotomous index (presence or not) where the probe runs along the entire marginal gum, demonstrating whether or not there is adequate control in brushing.
4- Plaque Index Assessment: SILNESS & LÖE Plaque Index (PI): dichotomous index (presence or not) that evaluates the presence of bacterial plaque on each surface of the same tooth.
5- Gingival recession: apical displacement of the gingival margin about the cementoenamel junction (CEJ); it is associated with attachment loss and exposure of the root surface to the oral environment (Cortellini & Bissada, 2018). Gingival recession was measured in mm in the center of the buccal surface of each tooth with a periodontal probe. Gingival recession was further classified based on the new Periodontal Disease Classification and the periodontal biotype (width of keratinized tissue and gingival thickness) was evaluated (Cortellini & Bissada 2018).

- Keratinized tissue width (LTQ): measured with a probe positioned between the gingival margin and the mucogingival junction.
- Gingival thickness (GE) (measured through the visibility of the probe): after its placement in the buccal groove, the gingival thickness was defined as thin ≤1.0 mm (score 0) or thick > 1 mm (score 1).

Clinical examinations were performed by a single examiner after calibration. To obtain these measurements, a periodontal probe of the COLOR CODED PROBE CP-ISUNC-PCPUNC15 (Hu-friedy, USA) was used.

Revista ARACÊ
ISSN: 2358-2472

At the end of the clinical examination, each patient received instruction and information on oral hygiene, to make them aware of the importance of self-care and participation in treatment.

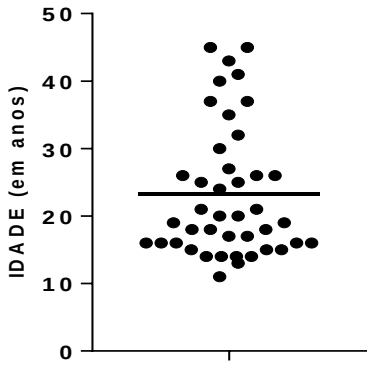
Statistical Analysis

Statistical analysis was performed using the Bioestat @ program - version 5.3 (Mamirauá Institute for Sustainable Development, Brazil, AM), with a significance level of $p<0.05$, considering family income, age, and periodontal clinical parameters as variables. The variables were tested for normality and homogeneity (Shapiro-Wilk test) and, as the data did not show normality, they were submitted to the Mann-Whitney test for a comparison between intragroup means and the Kruskal-Wallis test and Dunn's post-test for comparison between groups. The correlation between the variables was analyzed using the Spearman Correlation Test with values of $p<0.05$.

RESULTS

The analysis of the age of the 42 patients showed a mean age of 23.26 ± 9.64 years (Graph 1), with no difference between the mean ages between the 4 groups according to the type of cleft (Table 1)

Graph 1: Age distribution of the 42 **patients, with mean = 23.26 and standard deviation = 9.64.**



Revista ARACÊ
ISSN: 2358-2472

Table 1: Age of the 42 patients according to the type of cleft. Values expressed as mean ± standard deviation

Crack type	Age
Cleft lip (L)	19.7 ± 7.2
Cleft lip and alveolus (LA)	20.3 ± 6.0
Cleft lip, alveolus, and palate (LAP)	28.6 ± 11.9
Isolated cleft palate (FIP)	17.2 ± 2.5
Total	**42**

In the assessment of family income, measured in minimum wages per person, 31% reported receiving up to 0.5 salaries per person, 22% from 05 to 1 salary, 31% between 1 and 2 salaries, 14% from 2 to 3 salaries, and 2% more than 3 salaries per person (Graph 2). There was no difference between the mean minimum wage incomes between the 4 groups (Table 2).

Graph 2: Distribution of income (minimum wages) of the 42 patients

Table 2: Income in minimum wages of the 42 patients according to the type of cleft. Values are expressed as mean ± standard deviation.

Crack type	Income
Cleft lip (L)	1.0 ± 0.4
Cleft lip and alveolus (LA)	1.0 ± 0.6
Cleft lip, alveolus, and palate (LAP)	1.1 ± 0.5
Isolated cleft palate (FIP)	1.0 ± 0.7
Total	**42**

Data were not statistically significant (p> 0.05). Kruskall-Wallis Test

Table 3 shows the distribution of patients according to the type of cleft hair, according to the classification of FOGH – ANDERSEN (1942). Of the 42 patients, 8 had

Revista ARACÊ
ISSN: 2358-2472

cleft lip (L), 2 with left cleft lip (LE), 3 with right cleft lip (LD), and 3 with a diagnosis of bilateral cleft lip. Cleft lip alveolus (AL) was observed in 13 patients: 8 AL on the left, 4 AL on the right, and 1 AL bilaterally. Cleft lip, alveolus, and palate (LAP) were found in 17 patients, of which: 7 LAP on the left, 6 LAP on the right, and 4 LAP bilaterally. Isolated cleft palate (FIP) was present in 4 patients.

Table 3 - Type of crack classified according to the FOGH classification – ANDERSEN (1942):

Type of Crack	Cleft lip (L)	Cleft lip and alveolus (LA)	Cleft lip, alveolus, and palate (LAP)	Isolated cleft palate (FIP)	**TOTAL**
Left (LE) Right (LD) Bilateral (LB)	2 3 3				
Left (LAE) Right (LAD) Bilateral (LAB)		8 4 1			
Left (LAPE) Right (LAPD) Bilateral (LAPB)			7 6 4	4	**42**
TOTAL					

Source: Author

Table 4 shows the mean values of the clinical parameters according to the types of cleft. Patients with cleft lip, lip, and alveolus, and cleft lip alveolus and palate were considered.

In the evaluation of the Plaque Index (PI), Gingival Index (GA), percentage of bleeding on probing (SS), Gingival Thickness (EG), and Keratinized Tissue Width (LTQ) there were no statistically significant differences between the types of cleft nor when comparing these conditions in the cleft region with the results obtained in the lower arch.

About the Probing Depth (PS), patients with LAP cleft had a significant increase in the L and LA groups in the cleft region. In all groups, the cleft region presented significantly higher SP when compared to the lower arch.

Revista ARACÊ
ISSN: 2358-2472

In the evaluation of the clinical attachment level (NI), there was a significant increase in the LAP group, when compared to L and LA when the cleft region was evaluated. All groups showed a significant increase when compared to the lower arch.

Table 4: Clinical Parameters of the 38 Patients evaluated according to the type of cleft. Values are expressed as mean ± standard deviation.

	Cleft lip (L)	Cleft lip and alveolus (LA)	Cleft lip, alveolus and palate (LAP)	P-value
IP (%) Fissure Region **PI (%) lower arch** P-value	19.2 ± 0.2 22.4 ± 0.3 **0,4249**	25.6 ± 0.2 34.3 ± 0.3 **0,3694**	26.4 ± 0.2 31.7 ± 0.3 **0,4249**	**0,5446** **0,4728**
GI (%) fissure region **GA (%) lower arch** P-value	0.0 ± 0.0 1.5 ± 0.03 **0,1038**	1.3 ± 0.05 3.5 ± 0.06 **0,1045**	3.2 ± 0.06 5.9 ± 0.1 **0,0841**	**0,6048** **0,4231**
SS (%) fissure region **SS (%) mandibular arch** P-value	0 0.6 ± 0.02 **0,3372**	0 0.3 ± 0.01 **0,3694**	0.2 ± 0.01 0.6 ± 0.01 **0,2192**	**0,3047** **0,9032**
PS (mm) fissure region **PS (mm) lower arch** P-value	2.9 ± 0.6 **AB** 2.1 ± 0.6 * **0,0079**	2.5 ± 0.5 **A** 1.9 ± 0.5 * **0,0026**	3.6 ± 1.3 **B** 2.2 ± 0.6 * **0,0001**	**0,0090** **0,2738**
NI (mm) fissure region **NI (mm) lower arch** P-value	3.07 ± 0.7 **AB** 2.0 ± 0.5 * **0,0023**	2.6 ± 0.6 **A** 1.8 ± 0.5 * **0,0008**	4.1 ± 1.4 **B** 2.3 ± 0.7 * **0,0001**	**0,0027** **0,1630**
EG (score) fissure region **EG (score) lower arch** P-value	0 0	0 0	0 0	
LTQ (mm) fissure region **LTQ (mm) lower arch** P-value	2.9 ± 0.7 2.6 ± 0.4 **0,1240**	2.3 ± 1.0 2.1 ± 0.6 **0,3792**	2.4 ± 0.8 2.3 ± 0.6 **0,2347**	**0,2409** **0,1331**
Total	**8**	**13**	**17**	**38**

Different letters – statistically different between the groups – Kruskal-Wallis test and Dunn's post-test; * statistically different within the same group between regions - Mann-Whitney test ($p < 0.05$).

Revista ARACÊ
ISSN: 2358-2472

Table 5 shows the correlation of family income by type of cleft with the clinical parameters of the Plaque Index, Gingival Index, Probing Depth, and Clinical Insertion Level.

A positive and significant relationship was observed between the gingival index and the family income of the patients in the LAP group (Spearman's correlation = 0.5329, p=0.0276).

Table 5. Correlation between the family income of each group according to the type of cleft and the periodontal clinical parameters

	Family income(Cleft lip (L))	Household income (Cleft lip and socket (LA))	Family income (Cleft lip, alveolus, and palate (LAP))
Plaque Index	0,1543 (p=0.7152)	0,2779 (p=0.3579)	0,1714 (p=0.5106)
Gingival Index	0,6187 (p=0.1019)	- 0,1691 (p=0.5807)	0,5329 (p=0.0276)*
Probing depth	0,3493 (p=0.3964)	0,0964 (p=0.7542)	-0,0066 (p=0, 9801)
Clinical Insertion Level	0,2315 (p=0.5813)	- 0,0767 (p=0.8034)	0,0000 (p=ns)

N=38 *indicates a statistically significant difference. Spearman's Correlation Test (p<0.05)

DISCUSSION

Cleft lip and palate (CLPs) are the most common congenital abnormalities affecting the face, with worldwide data reporting the incidence of 1 in 700 live births (PRASAD et al., 2019; YANG et al., 2019; YILMAZ, et al., 2019). In Brazil, the average prevalence of CLPs is 0.36 per 1,000 live births (VIENA et al., 2014; ANDRADE et al., 2018).

The type of cleft described in the literature as the most prevalent in Brazil is the cleft that affects the lip, alveolus, and palate concomitantly, ranging from 39% to 92% of cases (VIENA et al., 2014; ALARCÓN et al., 2017ANDRADE et al., 2018). In the present study, cleft lip, alveolus and palate (LAP) were the most frequent, followed by cleft lip and alveolus (LA), cleft lip (L) and isolated cleft palate (FIP), respectively, corroborating the findings in the current literature (ALMEIDA et al., 2007; HUYNH-BA et al., 2009; ALMEIDA et al., 2013; MORALEJO et al., 2013; MOREIRA et al., 2014; VIENA et al., 2014; ALARCÓN et al., 2017; STELZLE et al., 2017; VIENA et al., 2017; ANDRADE et al., 2018; SILVA et al., 2018).

Revista ARACÊ
ISSN: 2358-2472

The mean age found in the patients evaluated was 23.26 ± 9.64 years, similar to the studies by Almeida 2007, Huynh-Ba et al., 2009, Nagappan et al., 2015, Perdikogianni et al., 2015, Almeida et al., 2013, Moreira et al., 2014, Stelzle et al., 2017, and Silva et al., 2018. The low mean age is due to the inclusion criteria and, according to some authors, may be related to the results, demonstrating beforehand that the vast majority of patients did not have the severe periodontal disease since periodontal disease tends to evolve with age (ALMEIDA et al., 20006; ALMEIDA, 2007; HUYNH-BA et al., 2009; NAGAPPAN et al., 2015; PERDIKOGIANNI et al., 2015; ALMEIDA et al., 2013; MOREIRA et al., 2014; STELZLE et al., 2017; SILVA et al., 2018; BOSI et al., 2018; MUNCINELLI et al., 2018).

Regarding socioeconomic classification, the average income of most of the population studied was less than or equal to one minimum wage, which is in line with the findings of Almeida et al., 2013, Moreira et al., 2014, Costa et al., 2003, Mariano et al., 2018, Almeida et al., 2009, Dalben et al., 2002 and Freitas et al., 2004.

In the evaluation of Plaque Index (PI), Gingival Index (GI), bleeding on probing (SS), Keratinized Tissue Width (LTQ) and Gingival Thickness (EG) there were no statistically significant differences between the types of cleft, neither when comparing these conditions in the whole mouth nor when comparing only the sextant in the cleft region, a result similar to that pointed out by Lages et al. 2004, Siqueira et al., 2006, Almeida et al., 2007, Stec et al., 2007, Almeida et al., 2008, Almeida et al., 2009, Almeida et al., 2013.

On the other hand, when the Probing Depth (SP) and the clinical attachment level (NI) were evaluated, patients with cleft lip, alveolus, and palate (LAP) had a significant increase in the L and LA groups. When comparing the results of the cleft region with the results of the lower arch within each group, a significant increase in SP and NI was observed in the three groups. These findings coincide with those of Ragghianti et al., 2003, Quirynen et al., 2003, Almeida 2007, Almeida et al., 2013, and Almeida 2009.

As described in the methodology, the patients evaluated are followed up in a specialized care center, which may have contributed to the finding of good clinical parameters and low prevalence of periodontal disease. Brand et al., 2013 and Oliveira Costa et al., 2011 emphasized that the more periodontal maintenance visits, the better the values of the clinical parameters evaluated, due to the plaque control itself obtained in the treatment and the frequent repetition of hygiene instructions and patient motivation.

Revista ARACÊ
ISSN: 2358-2472

FINAL CONSIDERATIONS

According to the results obtained in the present work, we can consider that:

1. The most frequent type of cleft lip and palate in the sample was cleft lip, alveolus, and palate (LAP).
2. The patients had a low prevalence and severity of periodontal disease.
3. Regarding the different types of clefts, patients with LAP had a significant increase in the Probing Depth (PS) and Clinical Attachment Level (NI) indices of the L and LA groups.
4. The teeth close to the fissure presented periodontal indices related to SP and NI that were significantly different from the others.
5. There was a tendency to increase the gingival index about income in the LAP group.

Revista ARACÊ
ISSN: 2358-2472

REFERENCES

1. Almeida, A. L. P. F., et al. (2005). Periodontal health re-establishment in cleft lip and palate patients through vestibuloplasty associated with free gingival graft. Periodontal Practice Today, 2(1).

2. Almeida, A. L. P. F. (2007). Epidemiological evaluation of the periodontal condition of patients with cleft lip and palate at the Hospital for Rehabilitation of Craniofacial Anomalies. São Paulo: University of São Paulo.

3. Almeida, A. L. P. F., et al. (2009). Are teeth close to the cleft more susceptible to periodontal disease? Cleft Palate Craniofacial Journal, 46(2), 161–165.

4. Almeida, A. L. P. F., et al. (2012). Gingival recession in individuals with cleft lip and palate: Prevalence and severity. Cleft Palate Craniofacial Journal, 49(1), 92–95.

5. Almeida, A. M. F. L., et al. (2017). Care for cleft lip and palate patients: Modeling proposal for the assessment of specialized centers in Brazil. Saúde em Debate, 41(SPE), 156–166.

6. Alarcón, K. M. G., & De Andrade Sá, A. J. (2017). Epidemiological profile of patients with cleft lip and palate treated by a reference surgical team in the State of Amazonas. Revista Brasileira de Cirurgia Plástica, 32(4), 486–490.

7. Andrade, N. M., et al. (2018). Prevalence of cleft lip and palate in Brazilian children 2011–2015. Internet Journal of Medical Update-EJOURNAL, 13(1).

8. Benington, I. C., et al. (1979). Restorative treatment of the cleft palate patient. British Dental Journal, 146(4), 115.

9. Black, A. D. (1918). Roentgenographic studies of tissues involved in chronic mouth infections. Journal of the American Medical Association, 71(16), 1279–1283.

10. Bosi, S. V., et al. (2018). Profile of patients treated at the periodontics clinic of the Centro Universitário da Serra Gaúcha (FSG). Archives of Health Investigation, 7(6).

11. Bonani-Saqueti, J. C., et al. (2017). Secondary alveolar bone graft as a treatment protocol in a patient with cleft lip and palate. Revista Uningá Review, 32(1), 20–30.

12. Brägger, U., et al. (1985). Periodontal conditions in adolescents with cleft lip, alveolus and palate following treatment in a co-ordinated team approach. Journal of Clinical Periodontology, 12(6), 494–502.

13. Brand, V. S., et al. (2013). Impact of single-session motivational interviewing on clinical outcomes following periodontal maintenance therapy. International Journal of Dental Hygiene, 11(2), 134–141.

Revista ARACÊ
ISSN: 2358-2472

14. Caton, J. G., et al. (2018). A new classification scheme for periodontal and peri-implant diseases and conditions – Introduction and key changes from the 1999 classification. Journal of Clinical Periodontology, 45(Suppl 20), S1–S8.

15. Chapple, I. L. C., et al. (2018). Periodontal health and gingival diseases and conditions on an intact and a reduced periodontium: Consensus report of workgroup 1 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. Journal of Clinical Periodontology, 45(Suppl 20), S68–S77.

16. Cortellini, P., & Bissada, N. F. (2018). Mucogingival conditions in the natural dentition: Narrative review, case definitions, and diagnostic considerations. Journal of Clinical Periodontology, 45, S190–S198.

17. Cosme, H. W., Silva-Lima, L., & Garcia, B. L. (2017). Prevalence of congenital anomalies and associated factors in newborns in the city of São Paulo from 2010 to 2014. Revista Paulista de Pediatria, 35(1).

18. Costa, B., et al. (2003). Clinical and microbiological evaluation of the periodontal status of children with unilateral complete cleft lip and palate. Cleft Palate Craniofacial Journal, 40(3), 585–589.

19. Costa, F. O., et al. (2011). Progression of periodontitis in a sample of regular and irregular compliers under maintenance therapy: a 3-year follow-up study. Journal of Periodontology, 82(9), 1279–1287.

20. Dalben, G. S. (2002). Prevalence of cleft lip and palate types among non-operated patients [Monograph]. Bauru: Hospital de Anomalias Craniofaciais.

21. Dewinter, G., et al. (2003). Dental abnormalities, bone graft quality, and periodontal conditions in patients with unilateral cleft lip and palate at different phases of orthodontic treatment. Cleft Palate Craniofacial Journal, 40(4), 343–350.

22. Dixon, M. J., et al. (2011). Cleft lip and palate: understanding genetic and environmental influences. Nature Reviews Genetics, 12(3), 167–178.

23. Dourado, I. M. C. (1993). Analysis of the periodontal treatment needs of patients with cleft lip and palate at HPRLL – USP/ Bauru, using the CPITN index. Bauru: University of São Paulo.

24. Fogh-Andersen, P. (1942). Inheritance of cleft lip and cleft palate. Nyt Nordisk Forland-Arnold Busck, Copenhagen.

25. Fontoura, F. C., & Moreira, L. C. (2014). Association of congenital malformations with neonatal and maternal variables in Neonatal Units in a city in the Northeast of Brazil. Text & Context Nursing, 23(4).

26. Freitas, J. A., et al. (2005). Current data on the characterization of oral clefts in Brazil. Pesquisa Odontológica Brasileira, 18(2), 128–133.

Revista ARACÊ
ISSN: 2358-2472

27. Graciano, M. I. G. (1976). Evaluation criteria for socioeconomic classification. Bauru: HPRLLP.

28. Huynh-Ba, G., et al. (2009). Periodontal disease progression in subjects with orofacial clefts over a 25-year follow-up period. Journal of Clinical Periodontology, 36(10), 836–842.

29. Khan, M. F. J., et al. (2018). Evaluating LINE-1 methylation in cleft lip tissues and its association with early pregnancy exposures. Epigenomics, 10(1), 105–113.

30. Lages, E. M. B., Badeia, M., & Pordeus, I. A. (2004). Oral health of individuals with cleft lip, cleft palate, or both. Cleft Palate Journal, 41(1), 59–63.

31. Lang, N. P., & Bartold, P. M. (2018). Periodontal health. Journal of Clinical Periodontology, 45(Suppl 20), S9–S16.

32. Lindhe, J., Lang, K. P., & Karring, T. (2010). Treaty of Clinical Periodontics and Oral Implantology (5th ed.). Rio de Janeiro: Guanabara Koogan.

33. Loe, H., & Silness, J. (1963). Periodontal disease in pregnancy: Prevalence and severity. Acta Odontologica Scandinavica, 21, 533–551.

34. Löe, H., et al. (1978). The natural history of periodontal disease in man: The rate of periodontal destruction before 40 years of age. Journal of Periodontology, 49(12), 607–620.

35. Löe, H., et al. (1978). The natural history of periodontal disease in man: Study design and baseline data. Journal of Periodontal Research, 13(6), 550–562.

36. Machorowska-Pieniażek, A., et al. (2016). Effects of Brazilian propolis on dental plaque and gingiva in patients with oral cleft malformation treated with multibracket and removable appliances: A comparative study. Evidence-Based Complementary and Alternative Medicine, 2016.

37. Machorowska-Pieniażek, A., et al. (2017). A comparative study of oral microbiota in infants with complete cleft lip and palate or cleft soft palate. BioMed Research International, 2017.

38. Miller, P. D. (1995). A classification of marginal tissue recession. International Journal of Periodontics & Restorative Dentistry, 5(2), 9–37.

39. Mariano, N. C. R., et al. (2018). Impact of orofacial dysfunction on the quality of life of adult patients with cleft lip and palate. The Cleft Palate-Craniofacial Journal, 55(8), 1138–1144.

40. Moreira, B. N. (2014). Longitudinal evaluation of periodontal status in individuals with cleft lip, alveolar ridge and palate. São Paulo: University of São Paulo.

Revista ARACÊ
ISSN: 2358-2472

41. Moralejo, C. D. S., et al. (2013). Evaluation of oral hygiene conditions and habits in patients with cleft lip and palate - retrospective study. Citizenship in Action: Journal of Extension and Culture, 7(1).

42. Mossey, P. A., et al. (2009). Cleft lip and palate. Lancet, 374(9730), 1773–1785.

43. Muncinelli, E. A. G., et al. (2012). Periodontal aspects in patients with cleft lip and palate. PerioNews, 6(4), 359–363.

44. Nagappan, N., & John, J. (2015). Periodontal status among patients with cleft lip (CL), cleft palate (CP) and cleft lip, alveolus and palate (CLAP) in Chennai, India. Journal of Clinical and Diagnostic Research, 9(3), ZC53.

45. Nagem, H. Filho, & Martins, D. R. (1968). Teamwork in the rehabilitation of patients with lesions of lip and palate. Estomatologia e Cultura, 2(1), 127–132.

46. Papapanou, P. N., et al. (2018). Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. Journal of Periodontology, 89, S173–S182.

47. Parveen, S., et al. (2018). Three-dimensional assessment of alveolar bone thickness in individuals with nonsyndromic unilateral complete cleft lip and palate. Journal of Cleft Lip Palate and Craniofacial Anomalies, 5(2), 106.

48. Perdikogianni, H., et al. (2009). Periodontal and microbiological parameters in children and adolescents with cleft lip and/or palate. International Journal of Paediatric Dentistry, 19(6), 455–467.

49. Primo, T., et al. (2013). Parameters used for periodontal diagnosis in Brazilian dental schools. PerioNews, 7(3), 235–239.

50. Prasad, A., & Kharbanda, O. P. (2019). Interdisciplinary management of an adult bilateral cleft lip and palate patient with excessive incisor display—a case report. Turkish Journal of Orthodontics, 32(3), 176.

51. Quirynen, M., et al. (2003). A split-mouth study on periodontal and microbial parameters in children with complete unilateral cleft lip and palate. Journal of Clinical Periodontology, 30(1), 49–56.

52. Răducanu, A. M., et al. (2015). Considerations on morphological abnormalities of permanent teeth in children with cleft lip and palate. Romanian Journal of Morphology and Embryology, 56(2), 453–457.

53. Ragghianti, M. S. (2003). Epidemiological evaluation of the behavioral profile and risk factors associated with periodontal disease in patients at the Bauru School of Dentistry (Master's thesis). Bauru School of Dentistry, University of São Paulo, Bauru.

Revista ARACÊ
ISSN: 2358-2472

54. Rasmussen, S. A., et al. (2003). Guidelines for case classification for the national birth defects prevention study. Birth Defects Research Part A: Clinical and Molecular Teratology, 67(3), 193–201.

55. Razera, A. P. R., Trettene, A. S., & Tabaquim, M. L. M. (2016). The stressful impact of primary reconstructive surgeries on caregivers of children with cleft lip and palate. Boletim-Academia Paulista de Psicologia, 36(90), 105–123.

56. Schultes, G., Gaggl, A., & Karcher, H. (1999). Comparison of periodontal disease in patients with clefts of palate and patients with unilateral clefts of lip, palate and alveolus. Cleft Palate Craniofacial Journal, 34(4), 322–327.

57. Silva, B. C. F. (2018). Cross-sectional evaluation of periodontal parameters in individuals with cleft lip, alveolus and palate (Doctoral thesis). University of São Paulo.

58. Silva Filho, O. G., et al. (1992). Classification of cleft lip and palate: brief history, clinical considerations and suggestion for modification. Revista Brasileira de Cirurgia, 82(2), 59–65.

59. Silness, J., & Löe, J. (1964). Periodontal disease in pregnancy. II Correlation between oral hygiene and periodontal condition. Acta Odontologica Scandinavica, 22, 121–135.

60. Silva Filho, O. G., et al. (2007). Behavior of the median palatal suture in children undergoing rapid maxillary expansion: evaluation by computed tomography imaging. Dental Press Journal of Orthodontics and Facial Orthopedics, 94–103.

61. Siqueira, E. N. (2006). Comparative analysis of periodontal conditions between individuals with cleft lip and palate and those without (Monograph). Hospital for Rehabilitation of Craniofacial Anomalies, University of São Paulo, Bauru.

62. Spina, V., et al. (1972). Classification of cleft lip and cleft palate. Suggested changes. Revista do Hospital das Clínicas, 27(1), 5–6.

63. Stelzle, F., et al. (2017). Gingival esthetics and oral health-related quality of life in patients with cleft lip and palate. International Journal of Oral and Maxillofacial Surgery, 46(8), 993–999.

64. Teixeira, L. S. (2018). Experience report of the organization of an event on cleft lip and palate by an academic league of plastic surgery in Fortaleza. Citizenship in Action: Journal of Extension and Culture, 2(1), 168–177.

65. Tettamanti, L., et al. (2017). Prevalence of periodontal pathogens among Italian patients with chronic periodontitis: A retrospective study on 2992 patients. Oral & Implantology, 10(1), 28.

66. Viena, C. S., et al. (2017). Epidemiological study of cleft palate in the state of Bahia, Brazil. Brazilian Journal of Medicine and Human Health, 5(4), 123–133.

Revista ARACÊ
ISSN: 2358-2472

67. Yang, A. S., et al. (2019). Closer to the truth on national fistula prevalence after unilateral complete cleft lip and palate repair? The Cleft Care UK study. The Cleft Palate-Craniofacial Journal. https://doi.org/10.1177/1055665619858871

68. Yao, C. A., et al. (2018). The smile index: Part 1. A large-scale study of phenotypic norms for preoperative and postoperative unilateral cleft lip. Plastic and Reconstructive Surgery, 141(1), 137–146.

69. Yilmaz, H. N., Özbilen, E. O., & Üstün, T. (2019). The prevalence of cleft lip and palate patients: A single-center experience for 17 years. Turkish Journal of Orthodontics, 32(3), 139.