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Original Article

Dentistry Section

Periodontal Status Among Patients With Cleft Lip (CL), Cleft Palate (CP) and Cleft Lip, Alveolus and Palate (CLAP) In Chennai, India. A Comparative Study

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ABSTRACT

Background: Long term health of the stomatognathic system as well as esthetic aspects is the therapeutic goals in patients with oro facial clefts.

Aim: The aim of this study was to assess and compare the periodontal status of patients with cleft lip (CL), cleft palate (CP) and cleft lip, alveolus and palate (CLAP) reporting to a hospital in Chennai, India.

Materials and Methods: The study group consisted of 80 cleft patients. Subjects were divided into three groups. Group 1: patients with cleft lip (CL), Group 2: subjects with cleft palate (CP) and Group 3: subjects with cleft lip alveolus and palate (CLAP). Community Periodontal Index for Treatment needs CPITN Index was recorded.

Results: Among the 80 study subjects, 51 (63.8%) were males and 29 (36.2%) were females. Among the 26 study subjects with cleft lip, 10 (38.5%) had healthy periodontium, 4 (15.4%) had bleeding on probing and 12 (46.1%) had calculus. Mean number of sextants coded for healthy and bleeding was maximum among the subjects with cleft palate. Mean number of sextants coded for calculus was maximum among the subjects with cleft lip alveolus and palate. Prevalence of periodontal disease is high among patients with cleft lip, alveolus and palate (35%) than in Cleft lip (32.5%) and Cleft Palate (32.5%).

Conclusion: Gingivitis and Calculus is predominantly high in patients with Cleft Palate and Cleft Lip respectively.

Keywords: CPITN Index, Oro facial clefts, Periodontal Index, Periodontal status

INTRODUCTION

The World Health Organization defines Health the complete state of Physical, mental and social well-being and not just mere absence of disease [1]. The success of medical intervention is not only defined based on cure, remission or repair, but also by the maintenance or improvement of patient's quality of life [2-4]. The above statement holds true especially for children with chronic diseases and who require long term treatment protocols such as children with craniofacial abnormalities [5].

Partial fusion of the maxillary processes during the 4th to 12th week of fetal life results in orofacial cleft. Numerous factors has been identified as etiological agents. Monogenetic or polygenetic inheritance pattern is the most important etiological agent of genetic origin. The other factors contributing to orofacial cleft are alcohol, smoking, antibiotics and X-rays. The variation range from a cleft of lip, palate and alveolar process. Soft tissue deficiency, malformation of teeth and deficiency in jawbone volume are seen in the cleft site of most of the children [6].

The worldwide ratio of cleft lip to palate is 1:600 [7]. Worldwide prevalence of cleft lip was 3.28 per 10,000 [8]. Worldwide prevalence of cleft lip and palate was 6.64 per 10,000 [8]. The prevalence of newborns is between 27000 to 30000 every year [7]. The Native American tribes are of Montana, USA has the lowest incidence of 1:2076 [9].

The main reasons for treating patients with cleft lip, palate, and alveolus are function and esthetics. Good speech and health of the stomatognathic system are therapeutic aims of treatment. Along with the above mentioned goals, long term preservation of tooth must be important in patients with poor oral hygiene with a tendency to plaque retention, increase in transverse deficiency, teeth malpositioning, primary crossbite, arch length deficiency and periodontal trauma contributes to the detioration of periodontal health [6].

Epidemiologic studies show that the prevalence of cleft anomalies varies with factors such as socio-economic status, geographic location and racial background [10]. In Europe the mean prevalence of cleft anomalies is 0.62 per 1000 [11]. Consultations with patients who have cleft anomalies begin immediately after birth and the initial treatment begins during the first birth after childbirth [12]. Cleft palate associations worldwide including the American Cleft Palate Craniofacial association agree that the management of these patients is best provided by a multidisciplinary team of specialists including oral and maxillofacial surgeon, pediatrician, orthodontist, speech therapist, prosthodontist, pedodontist, etc [13].

The risk of developing carious lesions and periodontitis is more in children with cleft lip and palate increased in individuals with cleft lip and palate. Even before the complete closure, the soft tissue folds making it difficult to access the areas with conventional cleaning techniques and may serve as a habitat for putative pathogens. This increases the risk of enhancing the intraoral translocation of pathogens, thereby increasing the risk of periodontal infection [14].

High incidence of bleeding on probing and plaque in individuals with cleft lip, palate and alveolus (CLAP) was reported, after the analysis of progression rate [15]. Cumulative periodontal destruction is more in teeth with long supra crestal connective tissue attachment and which is adjacent to the cleft [6].

Uma sudhakar [16] found that the periodontal condition of bilateral cleft lip and palate patients was poorer than unilateral cleft lip and palate patients [16]. The extent of periodontal disease in individuals with cleft palate was similar to that of the general population, in a study conducted in Austria. The individuals with cleft lip, palate and alveolus are more prone to deep periodontal destructions of

the teeth which is adjacent to the cleft, than that of the general population in Austria [17].

Vinita Boloor et al., found in India only 28.8% of both the anterior and posterior sextants in the cleft lip group showed absence of periodontal disease. But the presence of periodontitis is seen more in subjects with cleft lip alveolus and palate (CLAP) also more destruction is seen in adjacent to the teeth [6].

Many epidemiological studies have proved that control subjects had good oral health status when compared to cleft subjects. There is no research about oral health status between different cleft types. However, questions arise on which of these cleft types have poor periodontal status. However, there are not many studies about the periodontal status of patients with clefts in India. Hence, the present study was undertaken to assess and compare the periodontal status of patients with cleft lip (CL), cleft palate (CP) and cleft lip, alveolus and palate (CLAP) reporting to a hospital in Chennai, India.

MATERIALS AND METHODS

The present study was conducted in 80 patients with age ranging from 6-18 y, who reported to the Smile Train center, Sri Ramachandra University, Chennai, during December 2012. Ethical approval was obtained from the Scientific Review Board and Institutional Human Ethical Committee of Saveetha University and Sri Ramachandra University. Informed consent was obtained from parents or guardian of study participants. They were divided into three groups: Group 1 consisted of 26 patients with Cleft Lip (CL), Group 2 consisted of 26 patients with Cleft palate (CP) and Group 3 consisted of 28 patients with Cleft Lip Alveolus and Palate (CLAP).

Sample size estimation

Sample size required for the study was calculated to be N = 75, with 80% power at 5% α- error, based on the studies conducted by (Magdalena Stecslonicz et al.,) [12] and (Tahir Paul et al.,) [18]. On the last day of examination 5 patients were reported to outpatient ward, they were also included in the study yielding a final sample size of 80.

Inclusion criteria

- Subjects having purely congenital cleft lip/cleft palate and those having cleft lip, alveolus and palate that was not operated.
- Systemically healthy subjects.

Exclusion criteria

- History of any systemic disease.
- Oral prophylaxis underwent 6 months prior to the study.

Clinical examination

Clinical examination was conducted by a single examiner who had been trained through a series of clinical training sessions at the Department of Public Health Dentistry, Saveetha Dental College & Hospital, Chennai. The dental examinations were conducted in a dental chair using a mouth mirror and Community Periodontal Index (CPI) probe. Instruments used were sterilized using standard protocol. Only completely filled forms were considered for analysis.

Periodontal status examination was done according to CPITN Index (WHO 1978) [19].

STATISTICAL ANALYSIS

The data collected was analysed and tested for significance using statistical software package, SPSS software for windows (version 17.0). Frequency tables were computed. ANOVA test was used to compare the mean scores of CPITN.

RESULTS

[Table/Fig-1] depicts the distribution of study subjects according to age and gender. Among the 80 study subjects, 51 (63.8%) were males and 29 (36.2%) were females.

[Table/Fig-2] depicts the subjectwise distribution of periodontal status based on cleft types. Among the 26 study subjects with cleft lip, 4 (15.4%) had bleeding on probing and 12 (46.1%) had calculus. Among the 26 study subjects with cleft palate, 6 (23%) had bleeding on probing and 7 (27%) had calculus. Among the 28 study subjects with cleft lip alveolus and palate, 5 (17.8%) had bleeding on probing and 11 (39.2%) had calculus. [Table/Fig-3] depicts the sextantwise distribution of periodontal status between cleft types. Mean number of sextants coded for healthy and bleeding was maximum among the subjects with cleft palate. Mean number of sextants coded for calculus was maximum among the subjects with cleft lip alveolus and palate.

[Table/Fig-4] depicts the distribution of study subjects based on cleft types and treatment needs. Among the 80 study subjects, 15 (18.8%) needed oral hygiene instructions and 30 (37.5%) require oral hygiene instructions and oral prophylaxis.

Age	Gender	Group 1		Group 2		Group 3	
		n	%	n	%	n	%
6-8 y	Male	4	22.2	6	35.2	2	12.5
	Female	1	12.5	1	11.1	1	8.3
9-11 y	Male	7	38.8	6	35.2	1	6.2
	Female	5	62.5	5	55.6	6	50
12-15 y	Male	3	16.8	5	29.6	6	37.5
	Female	0	0	1	11.1	1	8.3
16-18 y	Male	4	22.2	0	0	7	43.8
	Female	2	25	2	22.2	4	33.4
Total	Male	18	22.5	17	21.3	16	20
	Female	8	10	9	11.2	12	15

[Table/Fig-1]: Distribution of the study subjects

Cleft types	Periodontal status										Total	
	Healthy		Bleeding		Calculus		Shallow pocket		Deep pocket		n	%
	n	%	n	%	n	%	n	%	n	%		
Group 1	10	38.5	4	15.4	12	46.1	0	0	0	0	26	100
Group 2	13	50	6	23	7	27	0	0	0	0	26	100
Group 3	12	43	5	17.8	11	39.2	0	0	0	0	28	100

[Table/Fig-2]: Distribution of periodontal status based on cleft types $\chi^2 = 2.151$, df = 4, p = 0.708

CPITN scores	Cleft types			F - value	df	p - value
	Group 1 Mean ± SD	Group 2 Mean ± SD	Group 3 Mean ± SD			
Healthy	3.69±2.15	4.58±1.77	4.00±2.09	0.018	79	0.982
Bleeding	0.77±0.99	0.88±1.13	0.64±0.44	2.236		0.114
Calculus	1.54±1.90	0.54±0.94	1.36±1.85	0.806		0.450

[Table/Fig-3]: Sextantwise distribution of periodontal conditions based on cleft types

DISCUSSION

Oral disease represents a major health problem among patients with orofacial clefts (OFC) [20]. The prevalence and severity of oral disease among this group are higher when compared to the general population [17]. Poor periodontal health and oral cleanliness have been observed in children with OFC [21-24]. These results may be due to low physical abilities, consequent difficulties in tooth brushing, limited understanding on the importance of oral health management [25], difficulties in communicating oral health needs [26] and fear of oral health procedures [27].

Children constitute a priority group in planning any public health programme. However, all children are not considered equal, when normal healthy children get love, affection and care from their

Cleft types	Individual Treatment Needs						
	TN 0		TN 1		TN 2		TN 3
	n	%	n	%	n	%	
Cleft lip	10	28.5	4	26.6	12	40	0
Cleft palate	13	37.3	6	40.1	7	23.4	0
Cleft lip alveolus and palate	12	34.2	5	33.3	11	36.6	0
Total	35	43.7	15	18.8	30	37.5	0

[Table/Fig-4]: Distribution of study subjects based on cleft types and treatment needs
χ^2=8.246, df=4, p =0.082

parents and society. The children with OFC are usually deprived of it. Consequently, they suffer and are usually neglected in all fields of life, including health care.

Even though it is recommended that the dental health of cleft children should be brought upto and maintained to the level provided for other children, it is also observed that the dental problems of the OFC children are not very different from those of the normal children. There have been quite a few epidemiological studies conducted on OFC in India.

This cross sectional study was conducted among 80 patients with OFC of ages between 6-18 y. The periodontal status was recorded by using a CPITN Index [19]. The present study shows that the healthy periodontium was found to be 38.5% in Cleft Lip group, whereas in a study by Vinita Boloor et al., [6] reported that the healthy periodontium was 28.8%. This difference can be attributed to the regular dental check-up and good oral hygiene practices for the children by the parents in the present study.

In the present study gingival bleeding was observed in 15.4% in Cleft Lip, 23% in Cleft Palate whereas in a study by Magdarena Stec-Slonicz et al., [12] in German population 53% in Cleft Lip and 13% in Cleft Palate. This difference in the prevalence of gingivitis of Cleft Lip patients among present study was lower than the study by Magdarena Stec-Slonicz et al., [12] due to better oral hygiene of the population in the present study. The mean number of sextants coded for healthy and bleeding was found to be maximum among the patients with Cleft Palate and calculus was found to be maximum among the subjects with Cleft Lip Alveolus and Palate was found to be not statistically significant. We found out, among the 80 study subjects 15 (18.8%) needed oral hygiene instructions, 30 (37.5%) require oral hygiene instructions and oral prophylaxis whereas 35 (43.7%) did not require treatment.

Poor oral hygiene makes intensive efforts necessary to improve hygiene and prevent further pocketing. Thus the cleft patients must themselves be held for adequate oral hygiene and future state of their teeth. Further studies required for comparison between types of cleft and non-cleft children in larger population to evaluate the oral health status in cleft patients.

CONCLUSION

- √ Prevalence of periodontal disease is high among patients with cleft lip, alveolus and palate (35%) than in Cleft lip (32.5%) and Cleft Palate (32.5%).
- √ Prevalence of cleft lip and/or palate was found to be high in males (63.8%) compared to females (36.2%).
- √ Gingivitis is predominantly high in patients with Cleft Palate.
- √ Calculus is predominantly high in patients with Cleft Lip.

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