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To Determine Dental Caries & Oral Health Status of Patients with Cleft Lip & Cleft Palate Up to 18 Years of Age - A Cross-Sectional Study

Dr. Prithul Poddar[1], Dr. Parul Rawat[2], Dr. Ruchi Arora[3]

Address: A/W- 34, west Arunachal, Sodepur, 24 Pargana(N), West Bengal, India
Ph. Number: 8981378119
Email: *drprithulpoddar17[at]gmail.com*

Address: Udaipur, Rajasthan, India
Ph. Number: 9829141580
Email: *parulrawat.somani[at]gmail.com*

Address: Fatehpura, Udaipur, Rajasthan, India
Ph. Number: 9929098915
Email: *drruchiarora67[at]gmail.com*

Abstract: ***Introduction: The aim of this study will be to assess the prevalence of dental defects and oral health related quality of life in Cleft patients up to 18 years old children in Rajasthan. Materials and methods: The sample consisted of hundred cleft patients in the study group and hundred patients in the control group of under 18 years of age. Clinical examination was performed on all the patients to detect dental caries using DMFT/dmft index& oral hygiene status using OHI-S index. Student's t-test was used to compare the means between cleft group and the control group. The Chi-square test was employed to determine statistical differences in frequencies between the two groups and also we have evaluated the prevalence rate of dental defects according to their age criteria. Results: Poor oral hygiene and periodontal status was observed in cleft patients, respectively. In all tested dental defects, a higher frequency of dental anomalies was noted in the cleft patients as compared with the controls. There was also some significant difference in dental anomalies according to their age variations. Conclusion: This study shows that cleft children have higher prevalence of dental anomalies than normal children. It's essential that the patient with a cleft is monitored closely with regular follow up. Education about oral health must be given repeatedly.***

Keywords: OHI-S, Oral Hygiene Index Simplified, CLP, Cleft Lip, Palate

1. Introduction

Orofacial cleft is the most typical anomaly occurring within the craniofacial region. The calculable prevalence is 1.7 in thousand live births in our country. The presence of cleft lip or palate is a developmental anomaly. Thirty-five thousand new cleft patients are born every year in our country and 1 million cases remain untreated. The data from international registries between 1993 and 1998 suggest that a variation in prevalence of cleft li is 3.4–22.9 per 10,000 births and an even more pronounced variation for isolated cleft palate with the prevalence of 1.3–25.3 per 10,000 births[1].

However, these malformations are seen in developed countries in youngsters and sometimes adults can be seen with the malformation if that was not treated. In developing countries, some of the youngsters have the deformity repaired by having surgery, however others cannot afford it and got to live with the deformity throughout their whole lives. According to Murthy (2009), there are patients from the ages of a few days old up into the late 40s who have the corrective surgery for cleft anomaly. This range in age is due to different factors, like economic issues, lack of doctors, and of knowledge about cleft treatment procedures and the problems that they can effect. On other side in developed countries, it's very uncommon to find an adult who has an un-operated cleft anomaly, due to the facilities in medical services throughout these developed countries and the fact that the patients themselves have more knowledge about the congenital anomaly.

It is simpler to operate on children, because the maxilla has not grown as much and can be treated easily. When the accurate prenatal ultrasound is used the future parents can get counseling concerning the genetic risk, possibility of fetal loss, anticipation for infant surgery, and overall prognosis. In some cases it's been difficult to detect the cleft deformity in prenatal stages due to the acoustic shadowing from the surrounding structures. The management of the condition is a lifelong process and is multidisciplinary, dealing with issues such as facial deformities, difficulty in feeding, speech impairments, dental malocclusion, abnormal resonance, hearing difficulties[3] and puts enormous stress on the entire family[2].

Dental anomalies have been found to be more prevalent in subjects with cleft lip and palate than in those without cleft lip & palate and most past studies have shown that the dental anomalies were more frequent on the Cleft side of the maxilla. Hypodontia, hyperdontia, and delayed dental development are the most common types of dental anomalies observed. In cleft subjects, most dental defects occur in the lateral incisor region on the cleft side and frequently the permanent lateral incisors, within the cleft, are missing or demonstrate a delayed development[3].

Dental caries is found to be most common oral aliments among cleft cases; gingivitis, periodontal disease, hypodontia, hypoplasia, and maintenance of poor oral hygiene are also prevalent among CLP cases[4]. Dental caries is still a global public health problem causing a major threat to oral health of these cleft patients. It is commonly believed from studies conducted globally that children with CLP have an increased risk for caries, an elevated incidence and more untreated cavities, especially in the primary dentition[5]. Other studies have, however, not been able to confirm this and factors such as cleft type, inclusion of syndromes, the age of subjects, preventive care, and incidence levels on high of in-homogenous study styles could have contributed to the inconsistency[6]. With the presence of cleft within the oral cavity, the maintenance of good oral hygiene is troublesome and the youngsters are more at risk of developing dental caries. Also, the hypodontia, hyperdontia, and delayed dental development are the most usual types of dental defects observed. In cleft lip & palate subjects, most dental anomalies occur in the lateral incisor region on the cleft side and frequently the permanent lateral incisors, within the cleft, are missing or demonstrate a delayed development.The present study design to gather data on the following features of the dentition of this congenital defects from Rajasthan: (1) Dental caries, (2) Debris & calculus.

2. Aim and Objectives

The aim of this study is to assess the prevalence of dental defects and oral health related quality of life in Cleft patients up to 18 years old children in Rajasthan.

To evaluate the prevalence of dental caries in cleft patients using dental caries index (DMFT, dmft). To evaluate the oral hygiene using oral hygiene index-simplified (OHI-S).

3. Materials and Method

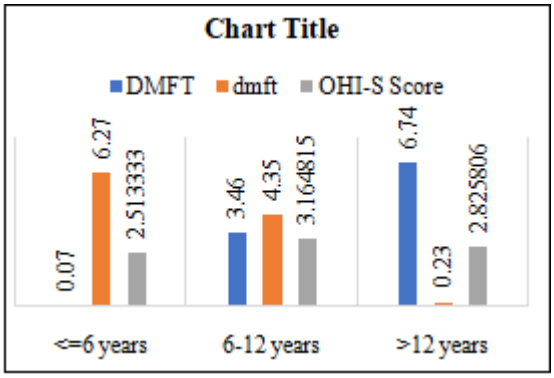
Hundred healthy patients visiting the Department of Pediatric and Preventive Dentistry, Darshan Dental college and Hospital, Udaipur under the 18 years age were selected. Ethical clearance was obtained from the Ethical committee to perform clinical and Radiological examination on patients.Selection of Participants were done with Inclusion Criteria Patients willing to participate in the study, Patient up to the age of 18 years, patients who have already been diagnosed with cleft. Exclusion CriteriaPatients who are un-cooperative or not willing for the study and Surgically treated patients.

The study was carried out on a total number of 100 cleft children patient from new born to 18 years with mean age (10.64±3.94) in cleft care center located in the suburbs area of the city of Rajasthan. There were a total of 100 patients, including 54 boys and 46 girls, with cleft lip and/or cleft palate. To evaluate the oral health status, two groups divided in to control group and study group.Dental Caries Examination were done. Dental caries was diagnosed clinically without radiograph. Changes in tooth color, sticking of the dental explorer in occlusal or proximal areas of each tooth, or the presence of a gray and black pits in a proximal surface was considered to be caries.Measured using the WHO deft/DMFT index calculation criteria. And to evaluate Debris & Calculus Examination the simplified oral hygiene index & compared it within the age groups & also with control groups. The simplified oral hygiene index (OHI-S) which differs from the oral hygiene index (OHI) in the number of tooth surfaces score (6 instead of 12) was used. For the deciduous teeth, index teeth recorded was the labial surfaces of the 54, 61, 82 and the lingual surface of 75; for children with mixed dentition we added the buccal surface of 26 and the lingual surface of 46 ; in the absence of deciduous dentition the buccal surfaces of 16, 26, lingual surfaces of 36, 46 and finally the labial surfaces of 11, 31 was examined and recorded. In the absence of index teeth, the next adjacent teeth was examined and recorded.

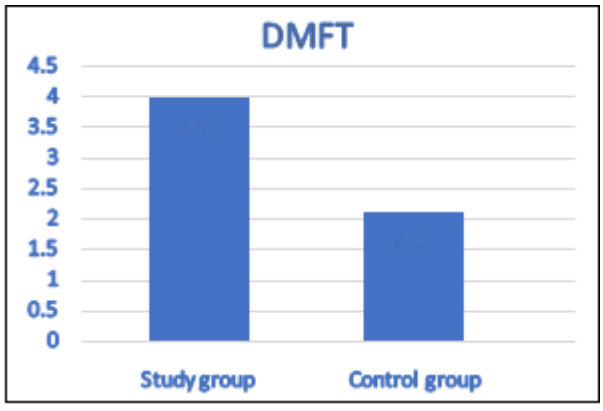
4. Observations, Calculation & Statistical Analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 21, IBM Inc. Descriptive data was reported for each variable. Descriptive statistics such as mean and standard deviation for continuous variables was calculated.

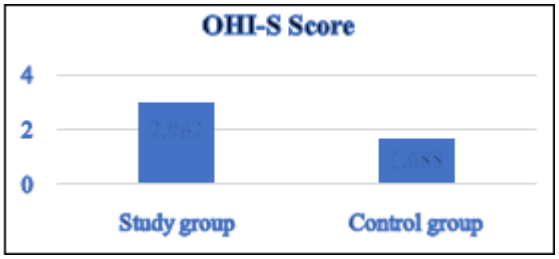
In this study a total number of 100 cleft children patient from new born to 18 years with mean age (10.64±3.94) were collected from the cleft care center located in the suburbs area of the city of Rajasthan.There were a total of 100 patients in the study group, including 54 boys and 46 girls, with cleft lip and/or cleft palate. To evaluate the oral health status. The data were analyzed by SPSS (21.0 version). Chi-Square test was done to compare all the categorical variables and the independent t-test to compare the two groups.Level of statistical significance was set at p-value less than 1.



Graph 1: Comparison of DMFT/dmfs and OHI-S Index with the age groups



Graph 2: Intergroup comparison of DMFT of study group with the control group



Graph 3: Intergroup comparison of OHI-S score of study group with the control group

5. Discussion

In the present study, 68 out of 100 cases came from rural areas whereas only 32 cases came from urban areas of the Western states of India. Although this can be a chance, the possibility is reduced since the recruitment was spread out over one year. For definitive conclusion of whether frequency of cleft defects is higher in the rural setting in India, population based studies are required as have been done in the United States and China[7]. The study done in Texas, USA[8], across urban-rural residence from 1999 to 2003 stated that living in more rural areas was associated with an increased adjusted risk of cleft. But cleft palate was not found to have similar association, whereas in a continuous monitoring done between 1988-1991 in China[9], no difference in occurrence of cleft lip & palate was observed between the urban and rural areas.

The socioeconomic status of a family determines the nutritional status of the children of the family that in turn determines their general health. As early as 1966, it has been suggested that the social class in which a woman is brought up (i.e. that of her father) is of more importance as regards her general health and the state of nutrition than the social class into which she marries (i.e. that of her husband)[10]. Female children are neglected since birth in poor families belonging to rural areas of the eastern part of India. This leads to the poor general health of these future mothers. In spite of the best efforts by our government rural people still live under unhygienic conditions which leads to repeated childhood infections and poor growth and general health of the females. Living in unhygienic conditions increases the risk of antenatal infections most of which go unnoticed and remain untreated due to ignorance as well as social discrimination shown towards the girl child. In some study many of the mothers of the affected children gave history of antenatal gastrointestinal and upper airways infection, which they ignored and left untreated. In absence of definite diagnosis it is plausible that some of these women (who gave history of antenatal upper airway symptoms) may have been affected by rubella, which is an upper airway infection mentioned to have a causal relation with cleft. Some of the mothers also gave history of drinking alcohol (country liquor) and smoking bidis during antenatal period. Alcohol and smoking are also mentioned to have a direct effect in causation of cleft in the offspring[11].

Dental Caries- Dental caries is the most common of the oral disease in childhood that is from the first through the twelfth year of life. In this crucial period, the primary teeth erupt, function and are exfoliated. Our study results found that the high prevalence of dental caries among cleft patients from the West Indian subcontinent in greater than 12 years of age [graph 2]. We have also found that there is high caries prevalence in cleft child than the non-cleft. There are studies which have found similar to our results, i.e., moderate caries to high caries risk in patients with cleft cases. A study by Hewson et al. has found a significant difference in caries experience in permanent teeth of cleft patients[12]. However, some studies have found low caries risk in cleft patients[52]. The differences in these findings might be due to different methodology, factors responsible for dental caries, oral hygiene practices, education awareness, and cultural practices. One of the possible explanations to low caries risk findings is that the patients were intervened at an early age for correction of cleft defects, which might have influenced parents and patients to keep the oral cavity hygienic. A recent meta-analysis has confirmed that the prevalence of dental caries is more in cleft patients compared to noncleft population[63]. The age-specific DMFT/dmft is given in graph 2. Permanent teeth in cleft cases have more number of caries incidence than the deciduous teeth.

Oral hygiene– Children with cleft may have poor oral hygiene habits due to poor self-motivation, lack of family support, difficulty in cleansing mispositioned teeth. It's seen that cleft child have poor oral hygiene than the non-cleft child (graph 3). In addition, they may have increased oral bacterial loads due to oronasal communication acting as a reservoir for bacteria[64]. OHI-S is used most commonly to assess the level of debris and calculus covering the tooth surface. It is seen that the patients with cleft have difficulty in maintaining oral hygiene due to the defect. In our study, we found that the average mean value for OHI-S was found to be 3.16±1.56 in 6–12 years' old patients and 2.83±1.52 in patients >12 years. The age-specific OHI-S is provided in Table 2. Nagappan and John in 2015 reported that the mean OHI-S score for their study was found to be 1.7[13]. Similar results were observed in a study conducted by Idown et al in 2011 and Boloor et al in Nigerian and Indian population[14]. We have also found that poor oral hygiene were seen mostly in mixed dentition period. There is not significant difference in oral hygiene in between adult & child patient but the patients who have permanent dentition they have tend to well maintaining their oral hygiene (graph 3).

6. Conclusion

Cleft lip & palate patient produces a variety of signs, symptoms, and complications. Based on the present data, the following conclusions can be drawn that cleft patient population demonstrated increased levels of dental deformity and periodontal problems compared to healthy counterparts. Oral hygiene status & periodontal problems are seen mostly in mixed dentition period of the cleft patient.

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