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Gingival Health and Oral Hygiene Practices of Schoolchildren in Chennai City

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ABSTRACT

Background: Gingivitis is reversible with both professional and at home care which includes efficient plaque removal. Plaque removal not only reverses the inflammation, but also prevents the periodontal progression and dental caries. If gingivitis and periodontitis are diagnosed early and addressed at that stage, it minimizes the chance of tooth loss.
Aim and objectives: The purpose of current study, therefore, was to assess the gingival health status in school children from Chennai city
Methodology: Information on the oral hygiene practices of 2,377 students studying in different schools of Chennai was collected using a questionnaire. The Community Periodontal Index of Treatment Needs (CPITN) was used \for diagnosing gingivitis. Chi-square test was used to analyze the differences among the variables in study.
Result: In primary dentition group prevalence of gingivitis was negligible (1.1%). In mixed dentition group, 33% had gingivitis while prevalence in permanent dentition group was 81.7%. In permanent dentition group, more than 95.4% children used tooth brush and Tooth paste for brushing their teeth and 85% children used horizontal method of brushing followed almost equally by circular and vertical methods.
Conclusion: This study reports a high prevalence of bleeding, especially among older children in permanent dentition group.

Keywords: Gingivitis, Permanent dentition, School children, CPITN

INTRODUCTION

Chronic Gingivitis is a most commonly occurring dental problem, which initiates as soon as early childhood. If the condition is left untreated, progresses to more destructive condition which finally leads to tooth loss. Gingivitis is reversible with both professional and at home care which includes efficient plaque removal. Plaque removal not only reverses the inflammation, but also prevents the periodontal progression and dental caries. If gingivitis and periodontitis are diagnosed early and addressed at that stage, it minimizes the chance of tooth loss. [1]

Tooth brushing and other oral hygiene practices become a part of people's lifestyles and this can directly or indirectly affect their general health sooner or later. Oral health behaviour may constitute an integral part of an individual's lifestyle. As most of the patterns of oral health practice are established at a young age, efficacious oral health education programs targeting that age group are necessary. [2] Epidemiological studies on gingivitis in children are important not only to keep track on the disease trends but also help in planning and executing oral health programs. That is why, oral health status at community level needs monitoring at regular intervals. [1] While numerous studies were done among children in developed countries, there is dearth of studies in developing countries. Few studies that are

existing reported high prevalence of poor oral hygiene and gingival inflammation. [3]

Vijayta Sharva et al [3] conducted a cross sectional study to assess the gingivitis among 12 & 15 year old school children of Bhopal district and reported a prevalence of 59%. Bhayya et al [4] reported prevalence of gingivitis 81% among school children in Maharashtra. Dhar et al [5] reported 84.37% prevalence of gingivitis among school going children of rural areas in Udaipur district. A.K Singh [6] reported a prevalence of 77.52% among schools children of 8 to 17 years of age in Lucknow region of Uttar Pradesh, India. Epidemiological studies conducted among school children in Chennai have shown a broad variation in gingivitis prevalence rates, varying from 24% to 89%. [7, 8,9] The purpose of current study, therefore, was to assess the gingival health status in school children from Chennai city.

METHODOLOGY

Study Setting: Present study was conducted to assess the prevalence of gingivitis among 5–16-year-old school-going children of Chennai city.

Duration and type of study: This descriptive, cross-sectional study was conducted for a period of 2 months from January 10, 2019, to march 10, 2019.

Sampling methods: For the selection of schools, a three- stage sampling procedure was adopted. During first stage, stratification of zones of Chennai city was done. In second stage, from each zone, schools were randomly selected. During the third stage, students were selected from each class by simple random technique using the student's attendance register till the desired sample from each class was met. The investigator was trained in the Department of Public health Dentistry, Sathyabama Dental College and Hospital, Chennai.

Sample size calculation: Sample size was calculated using the formula, $n= Z^2 (pq)/e^2$, and was found out to be 2,377.

Inclusion criteria:

1. Children willing to participate
2. Age group 5-16 years.
3. Children without any systemic illness.

Exclusion criteria:

1. Children who are not willing to participate
2. Children suffering from systemic illness
3. Children undergoing orthodontic treatment

Data collection procedure: Information on the oral hygiene practices of students was collected using a questionnaire which was completed by the students themselves with the assistance of the investigator. Questionnaire included demographic details and questions regarding oral hygiene practice like, frequency of brushing, materials used, other oral hygiene aids used, method of brushing.

The clinical evaluation was performed by calibrated examiners (Kappa test = 89%). A WHO periodontal probe and mouth mirror were used for the clinical examination.

The Community Periodontal Index of Treatment Needs (CPITN) [10] was used to establish a gingivitis diagnosis, according to the methodology for epidemiological studies described by WHO. In patients younger than 20 years 6 index teeth (16, 11, 26, 36, 31 and 46) were examined and codes 3 and 4 were excluded to avoid false pockets due to tooth eruption.

Ethical clearance:

Study was approved by from Institutional Review Board of Sathyabama Dental College and Hospital.

Data Analysis:

The statistical analysis of the data obtained was carried out using the SPSS software. A chi-square test was used to analyze the differences among the variables in study.

RESULTS

A total of 2377 children were examined for the presence of gingivitis and the age of participants ranged from 5 to16 years. Of the examined children, 814 had

primary dentition, 860 had mixed dentition while 703 children had permanent dentition.

In primary dentition group, 805 had normal gingiva while 9 had gingivitis. In mixed dentition group, 33% (284) had gingivitis while prevalence in permanent dentition group was, 81.7% (575 children)

In permanent dentition group, more than 95.4% children used tooth brush and Tooth paste for brushing their teeth and 85% children used horizontal method of brushing followed almost equally by circular and vertical methods.

Table 01: Oral hygiene practice among children with permanent dentition.

MATERIALS USED	**Frequency**	METHOD OF BRUSHING	**Frequency**
Tooth Brush and Tooth Paste	2268	Horizontal	2022
Tooth Brush and Tooth Powder	22	Vertical	162
Finger	87	Circular	176
Total	2377	Other	17
		Total	2377

Table 02: Comparison between group based on CPITN using Chi square value test and spearmen correlation test.

Type of Dentition	CPITN			
	Normal	**Bleeding**	**Calculus**	**Total**
Primary	805	9	0	814
Mixed	574	284	2	860
Permanent	123	575	5	703
Total	1502	868	7	2377
Chi square value = 1081.9; p value = 0.0001; r value = 0.667				

DISCUSSION

Gingivitis is the second most commonly occurring disease in the school aged children first after dental caries. The purpose of this study was to determine the prevalence of gingivitis among schoolchildren in Chennai and also to correlate it with their oral hygiene practices. Gingivitis diagnosis was performed using the Community Periodontal Index and Trearment Needs (CPITN). Studies done by Almans et al [11] and Cutress et al [12] compared the CPITN with other periodontal indices. They found that the CPITN was more sensitive to the identification of existing periodontal conditions CPITN is preferable to the Periodontal Index (PI) for epidemiological purpose. Periodontal component of CPI has same scoring criteria as CPITN, which is why it was used in the present study

The overall prevalence rate obtained in the current study was 37%,it is less when compared to study by Dhar et al, [5] who reported that overall prevalence of gingivitis in school going children of rural areas of India as 84.3%. Another study conducted by Mathur et al [13] reported 100% prevalence. Similar study conducted by Sharva et al [3] among 12 and 15 year old urban and rural school children in Bhopal district, reported 59% prevalence of gingivitis. This might be attributed to the better oral hygiene awareness among the children.

In the present study, it was observed that the prevalence of gingivitis increased with age. This increase with age may be due to exfoliation and tooth-eruption processes, which contribute to a higher accumulation of bacterial plaque. In a similar study, among children around 10 years of age, Hugoson et al [14] found that gingivitis was more prevalent in regions with teeth in the process of eruption. A study done by Todd and Dodd [15] also reported similar finding that the prevalence of gingivitis increased with age, being 18% in 5-year-old children which increased with increasing age and was found to be 54% in 15-year-old adolescents. Similar studies by, Massler et al [16] and Parfitt [17] showed that the prevalence of gingivitis increased with age, reaching its maximum during puberty

Among all the groups, 95.4% of population used tooth brush and toothpaste or toothpowder for cleaning their teeth. 3.3 % children clean their teeth with their finger. This clearly indicates their awareness about oral hygiene.

Among children in permanent dentition group, 85.1% brushed once a day which is in line with the findings of shailee et al, [18] but high as compared with findings of Harikiran and Pallavi [19] and Peng et al. [20] Only 7.5% of students brushed twice

daily which is very low. This finding clearly explains the higher prevalence of gingivitis in permanent dentition group.

Most commonly used method of brushing was Horizontal method (85%), followed by circular (7.4%) and Vertical (6.8%) methods. Brushing techniques which use horizontal strokes are considered inefficient to clean the inter-dental areas and sulcus of the permanent teeth. It may also increase the risk of abrasion of dental tissues and gingival recession if brushed aggressively. [21]

This study reports a high prevalence of bleeding, especially among older children in permanent dentition group. The proportion of children with healthy gingival ranged from 51 percent among seven-year-olds to 12 percent of 15-19 year old. Calculus was the most prevalent condition, particularly among older children. There is a pressing need for primary preventive programs in the form of health education and health promotion. Based on the resources available, secondary level of prevention can be carried out later on.

There was no periodontitis in the children examined and this finding is consistent with previous studies. This is a optimistic finding as the deeper tissues are not damaged only gingiva is affected for which treatment can be given.

The present study does have few limitations. Children out of school were not included so the findings may not be generalized to all 5-12 year old Chennai children. Other periodontal parameters, such as pocket depth and attachment loss, socio economic status were not recorded. We expect a study addressing all this limitations to be designed in future.

CONCLUSION

This study reports a high prevalence of gingivitis, especially among older children in permanent dentition group. Prevalence increased with increasing age. Majority of the children brushed once a day, which can be attributed to the high prevalence of gingivitis.

Contribution: This study provided important insight regarding the prevalence of gingivitis with increasing age. These findings can help in planning a health education program using risk approach targeting the age group in which high prevalence was noticed.

Author contribution:

Pavani Bellamkonda: Designing the study, Manuscript preparation

Anu V: Study design, Proof reading

Judy Angel, Joal Rashma, Umamaheshwari S: Data Collection, Manuscript editing

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