Study of oral hygiene status and prevalence of gingival diseases in 10-12-year-old school children in Sholapur City, India

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Abstract

Objective: The study was carried out to assess the oral hygiene status and to determine the prevalence of gingival and periodontal diseases in 10-12-year-old school children in Sholapur City, India.
Method: A total of 1045 children (560 boys and 485 girls) aged 10-12 years were evaluated by questionnaires related to oral hygiene practices and clinical examination using Simplified Oral Hygiene Index (OHI-S) , Gingival Index and Russell's Periodontal index.
Result: All the children examined irrespective of the gender brushed their teeth with tooth brush and tooth paste. A total of 940 (90%) children brushed their teeth once in a day, while the remaining 105 (10%) brushed twice daily. Prevalence of gingival disease was 81% and males were more affected than females. Ten year old children were affected most by gingivitis. Good oral hygiene status was seen in 30% of total population examined, 2% had poor oral hygiene status and others (68%) showed fair oral hygiene status. Fifteen percent of the children had mild gingivitis, 64% had moderate gingivitis and 1% had severe gingivitis. Pockets were absent in all the children.
Conclusion: There was a high prevalence of gingival disease in the population examined in this study, indicating the need for community health activities and awareness programme to improve the oral health of the people in this particular stratum of population.

Key words: Oral hygiene, gingiva, Oral hygiene index, Gingival index, Periondontal index

Introduction

Dental health is as essential as total body health, for the overall well being of the person. The progress of gingivitis to periodontitis is one of the main causes of tooth loss. Most of the time, the occurrence of gingivitis depends on the oral hygiene habits of the population, which in turn depends on factors such as cultural background, religious norms, educational level and socioeconomic status.
Previous literature suggest presence of gingivitis in varying degree of severity in children and adolescents[1-2]. Many studies have reported that health-related behaviours are established in the pre-school years during the period of primary socialisation [3-6]. If the correct methods of health related habits are developed in preschool children, a chance of retaining their teeth for life time is increased.
Epidemiological surveys on gingivitis have been conducted in many parts of the world on different ethnic and cultural background[1-2] including India, however, periodic assessment of oral hygiene is recommended for development planning and implementation of oral health promotion strategies. The aim of the present study is to assess the oral hygiene status and the prevalence of gingival and periodontal disease status in 10-12 year old school children of Sholapur City, India.

Materials and method

Study population
The study was carried out as part of a school health programme conducted by a nongovernmental organization (NGO) of Sholapur. A cross sectional survey was conducted on 1045 children aged 10-12 years, who attended different government schools of Sholapur city.
Ethical approval for the study was obtained by the institutional Ethics Committee of Pandit Dindhayal Upadaya Dental College and Hospital. Written informed consent was obtained from the parents of each child.
Inclusion criteria: All 10 – 12 year old children in Sholapur City were eligible to participate in the study.
Exclusion criteria: Children undergoing orthodontic treatment were excluded from the study sample.
Single trained examiner, (STR, Author), examined all the children. Personal information regarding oral hygiene maintenance and the oral hygiene status was completed by another dentist. Intra-examiner reliability test was performed by examining a cohort of 25 children at two different time period of 1 week apart and the Kappa statistics accounted to 80%.
Diagnostic criteria
The oral hygiene status was assessed using Simplified Oral Hygiene Index (OHI-S) by Green and Vermillion (1964)[7].

Gingival condition was assessed using Gingival Index by Loe & Silness (1963)[8] and the periodontal condition was assessed by Russell's Periodontal Index (1956)[9].

Data analysis

Prevalence rate collected were compiled and subjected to statistical analysis using SPSS version 15.0. Chi-squared Test was executed to judge the difference between different age groups, Fishers Exact Test was used to judge the difference between males and females and; a value of $p<0.05$ was regarded as significant.

Result

Distribution of study sample is presented in **Table 1.** There were 560(53.5%) males and 485 (46.5%) females. **Figures 1 and 2** depict the method of mouth cleaning and frequency of cleaning the teeth. **Figure 3** presents the oral hygiene index of the sample being examined. Out of 1045 subjects examined, 68% of the sample showed fair oral hygiene status whereas 30% had good oral hygiene.

Figure 4 illustrates the gingival condition of the strata. Only 19% of the subjects examined showed healthy gingivae and 65% showed moderate gingivitis.

Periodontal condition of the examined population is shown in **Figure 5.** Mild gingivitis was seen in 15% of the subjects and pockets were not seen in the study group.

Prevalence of gingival disease according to age and gender are represented in **Tables 2 and 3.** Significant difference (0.004) was seen between male and female, with males being highly affected by gingival disease. The difference between the age groups was highly significant (0.000) with 11 year old children showing increased gingival lesions than the rest.

Table 1. Age and gender distribution of study population

Age (yrs)	Gender		Total
	Male(%)	Female(%)	
10	230(22%)	200(19%)	430(41%)
11	180(17%)	165(16%)	345(33%)
12	150(14%)	120(12%)	270(26%)
Total	**560(53.5%)**	**485(46.5%)**	**1045(100%)**

Table 2. Distribution of gingival disease according to age

Age(yrs)	Diseased	Healthy	P Value
10(430)(41%)	380(36%)	50(5%)	0.000
11(345)(33%)	280(27%)	65(6%)	(p<0.05)
12(270)(26%)	190(18%)	80(8%)	
Total 1045(100%)	850(81%)	195(19%)	

Table 3. Distribution of gingival disease according to gender

Gender	Diseased(%)	Healthy(%)	P Value
Males(560)(54%)	470(83.9%)	90(16.1%)	0.004
Females(485)(46%)	380(78.4%)	105(21.60%)	(p<0.05)
Total(1045)(100%)	850(81%)	195(19%)	

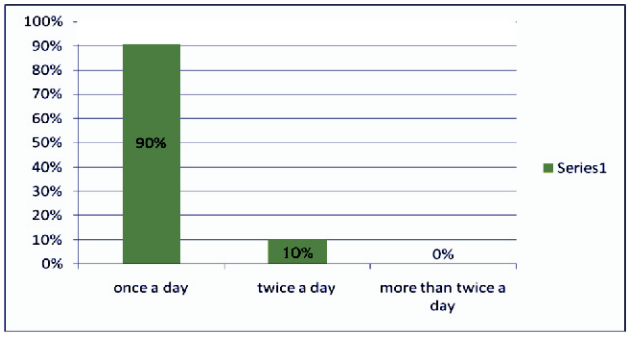

Figure 1. Frequency of tooth brushing

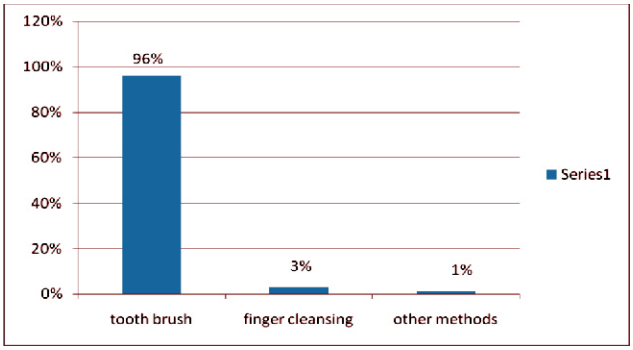

Figure 2. Method of cleaning the teeth

Discussion

Total well being of the society is determined by the healthy inhabitants in the population. Oral health is an integral part of general health and plays a significant role in improving the general well being of the individual. Oral health in turn is dependent on the maintenance of oral hygiene. The majority of students examined used tooth brush and tooth paste to clean their teeth while finger cleaning was seen in 30 children. Other methods of mouth cleaning include the use of neem stick and charcoal and the reported prevalence of their use was only 1%. Neem stick is a traditional tool for cleaning the teeth in India, and the present group of children used neem stick more than charcoal. The custom of cleaning the teeth with fingers and neem sticks is still practiced in certain parts of rural India, nevertheless the use of these traditional methods is decreasing. The number of children who brushed twice daily is still low (10%). The fact that all the children examined attended government school, and most come from illiterate low socioeconomic families is responsible for this finding. Findings from this study revealed that majority of students had fair oral hygiene, followed by good oral hygiene status and 2% had poor hygiene status, despite the low economic status of the students being examined and the finger cleaning method practiced by some. This finding is quite satisfying.

When gingival index was considered 81% of the population examined had gingivitis out of which 65% had moderate gingivitis and 15% mild gingivitis. In contrast to our results Vineeth et al[10], who did the study on school going children of rural areas of India using Loe and Silness index, have reported 84.37% overall prevalence which is high. Similar high prevalence was seen in studies of Pandit k[11], Jose et al[12] and Kumar et al[13], who studied the gingival status of school going children in different parts of India. Whereas

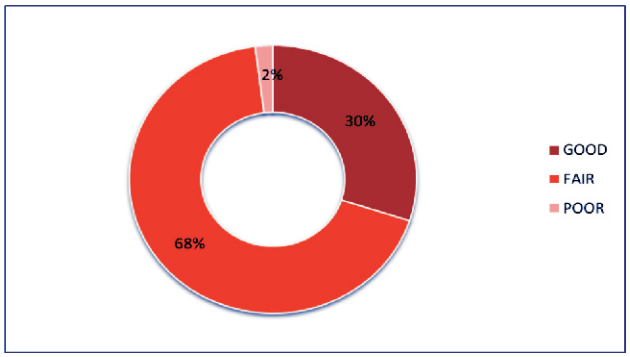

Figure 3: Oral Hygiene Index of the study population

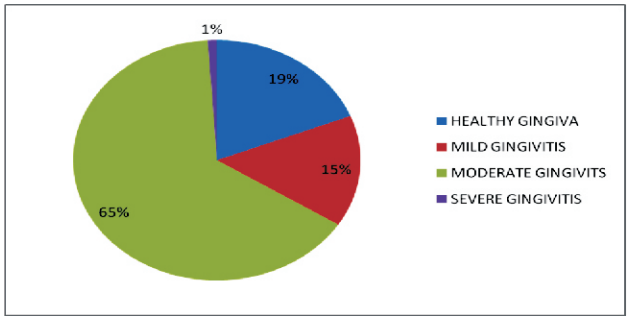

Figure 4. Gingival Index of the study population

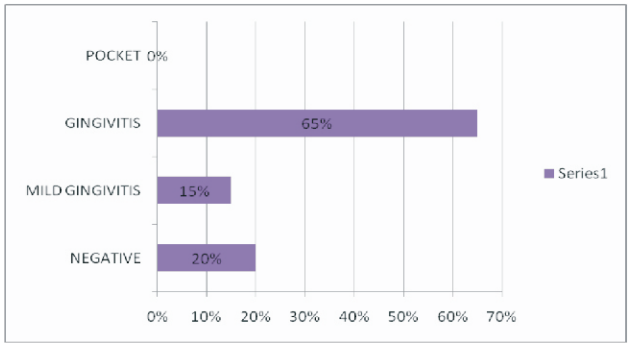

Figure 5. Russell's Index of the study population

100% prevalence was seen in the reports of Mathur et al[14] which is quite high when compared to our findings. This study was conducted in early 90s and this might be the reason behind the high prevalence of the gingivitis. Recent literature is suggestive of possible trend of lower prevalence of periodontal diseases in the recent years[15].
Gingival recession and operculitis/pericoronitis are the gingival lesions seen in this study whereas ulcerative lesions and abscess were not reported. The predisposing factors responsible for these findings were erupting teeth, traumatic bite and high frenal attachment Other than these, illiteracy and low socio-economic status were to be blamed for the high percentage of gingivitis.
When gender was considered, boys were affected more than the girls (0.004) and the reason behind this can be attributed to the cleanliness of the girls. Similar reports were given by Das et al[16] who studied the oral hygiene status of 6-12 school going children. Contrasting results were reported by Vineeth et al[10], Jose et al[12] and Kumar et al[13], who reported higher prevalence in girls. Even though previous studies have reported increased prevalence with increase in age, the results of present study were quite contrasting [10,12,13]. As the age increases the overall prevalence of gingivitis decreased; this is due to progressive accumulation of the brushing knowledge by the children as they develop.

Conclusion

It is evident from the discussion that higher prevalence of gingivitis needs an immediate attention in the present group of children. To eradiate the present dental health problem suitable community dental health programmes should be conducted to improve the overall well being of the population. Further, there exists a scope for studying the correlation between gingivitis and the causes for the same in detail, in different population groups.

References

1. Papapanou PN. Epidemiology of periodontal diseases: an update. J Int Acad Periodontol 1999; 1:110-116.
2. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century - the approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol 2003; 31 Suppl 1:3-23.
3. Holt RD. Pre-school - A Practical Treatment. Dental Update 1994; 21: 339-343.
4. Baric L, Blinkhorn AS, MacArthur C. Health education approach to nutrition and dental health education. Health Foundation J 1974; 33: 79-90.
5. Blinkhorn AS. Influence of social norms on tooth brushing behaviour of preschool children. Community Dent Oral Epidemiol 1978; 6: 222-226.
6. Perrson LA, Holm AK, Arvidsson S, Samuelsson G. Infant feeding and dental caries – a longitudinal study of Swedish children. Swed Dent J 1985; 9: 201-206.
7. Greene JC, Vermillion JR. The simplified oral hygiene index. J Am Dent Assoc 1964; 68: 7-13.
8. Loe H, Silness J. Periodontal disease in pregnancy. I. Prevalence and severity. Acta Odontologica Scand 1963; 21: 533-551.
9. Russell AL. A system of classification and scoring for prevalence surveys of periodontal disease. J Dental Res 1956; 35: 350-359.
10. Dhar V, Jain A, Van Dyke TE, Kohli A. Prevalence of gingival diseases, malocclusion and ?uorosis in school-going children of rural areas in Udaipur district. J Indian Soc Pedod Prev Dent 2007; 25:103-105.
11. Pandit K, Kannan AT, Sarana K, Agrawal K. periodontal disease and dental caries in primary school children in rural areas of Delhi. Indian J Pediatric 1986; 53:525-529.
12. Jose A, Joseph MR. Prevalence of dental health problems among school going children in rural Kerala. J Indian Soc Pedo Prev Dent 2003; 21:147-151.
13. Mahesh KP, Joseph T, Varma RB, Jayanth M. Oral health status of 5 years and 12 years school going children in Chennai city: An epidemiological study. J Indian Soc Pedo Prev Dent 2005; 23:17-22.
14. Mathur SK, Roy RK. Assessment of oral cleaning habit, bacterial plaque, gingivitis among school children. J Indian Dent Assoc 1931; 53:329-332.
15. Hugoson A, Norderyd O. Has the prevalence of periodontitis changed during the last 30 years? J Clin Periodontol 2008; 35: 338-345.
16. Das UM, Beena JP, Azher U. Oral health status of 6- and 12-year-old school going children in Bangalore city: An epidemiological study. J Indian Soc Pedo Prev Dent 2009; 27: 6-8.