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Research Article

EPIDEMIOLOGY OF GINGIVITIS INSCHOOL CHILDREN VISITING DEPT OF PERIODONTICS GOVT DENTAL COLLEGE SRINAGAR

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A B S T R A C T

Background and Objective: Gingivitis is the most prevalent oral disease in children, being strongly associated to social gradients. Many studies have reported different results concerning the extent and intra-oral distribution of gingivitis in children. The aim of this study was to investigate the epidemiologic parameters and socio-related risk factors of gingivitis in the 10–14-year-old schoolchildren population and to analyze its intra-oral distribution.

Maerial and Mehods: Cross-sectional data were obtained from 243 schoolchildren, social condition being assigned using a simple questionnaire. Classes of students were used as clusters in a single-stage cluster sampling method. An intra-oral exam was performed for all the children included in this study. Loe and Sillness scores, prevalence and the extent of gingivitis were calculated.

Results: The gingival scores showed a mild inflammation and the prevalence of gingivitis was 91%. Boys had a higher gingival (0.19 vs. 0.18; $p < 0.05$) and plaquescores (0.71 vs. 0.59; $p < 0.01$) than girls. Children who did not live in overcrowded households, whose parents had a better education and those who had direct access to school dental services displayed better gingival conditions ($p < 0.05$). Gingivitis was more severe on the upper teeth, with the maximum score being reached at the right upper lateral incisor.

INTRODUCTION

Plaque-induced gingivitis is the most prevalent periodontal disease in children and adolescents [1]. The periodontal microbiota is responsible along with the host immune response for most of the inflammatory gingival tissue changes by producing substances that can destroy cells and fibers from the gingival epithelium or from the connective tissue. Furthermore, there are some risk factors suchas low tooth brushing frequency, dental crowding, sexual hormones orsocial-related factors that can influence gingival inflammation [2,3]). Children older than 7 years of age have a high prevalence and severity of gingivitis, particularly due to puberty or presence of mixed dentition [4–6].During puberty the prevalence of gingivitis is over 80%, with the peak being reached somewhere between 11and 14 years [7,8]. Nakagawa *et al*. found that a high proportion of species of Prevotella intermedia, including Prevotella nigrescens during puberty ishormonal-related and is responsible for gingival inflammation [9]. Along with periodontal plaque components, plaque accumulation is also important, as plaque retention near and under the gingival margin is directly responsible for producing gingivitis.

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For example, Sch€atzle *et al*. found asignificant influence of plaque retained by tooth decays, restorations or dental calculus on the gingival margin[10,11].Socio-economic level is well recognized as a good indicator for periodontal condition, particularly for gingivitis. High prevalence of gingival bleeding was associated in many studies with poor educational and economic levels [12]. Moreover, race, number of family members, family income or parents' schooling were identified as periodontal-related issues [3,13]. Lopez *et al*. found that the number of family members over 7, low father income, low father education (up to primary school), or families who do not own at least one car are socio-economic items that are linked to loss of the periodontal attachment or to necrotizing ulcerative gingivitis [13]. The access to school dental services may also be associated to gingival score [14]. The major goals of the present screening were to analyze some of the epidemiological parameters of gingivitis, including socio-economic status and the presence of school dental services, in children aged 10–14 years, and to displaya complete intra-oral distribution, by recording the four gingival surface son each tooth.

MATERIAL AND METHODS

The examinations consisted of assessment of gingivitis and its risk factors using loe and Sillness scores. Gingivitis was

measured using gingival index (GI) and scoring all gingival stages, including score 1 (erythema). In addition, the following indices were used: plaque index (PlI). All these indices were recorded for each gingival surface: buccal, mesial,distal and oral. When a permanent tooth was not found, its corresponding primary tooth was scored. The third molars were excluded. The score2 for GI (stimulated gingival bleeding)was assessed by running a Goldman–Fox/Williams D/E periodontal probe along the internal wall of the gingival sulcus. No other diagnostic methodsor devices including dental radiographs were used. sample consisted of schoolchildren aged 10–17 years, but only 11, 12, 13 and 14 years age groups were big enough for a detailed statistical analysis. The epidemiological indicators used in this study were calculated as follows: the prevalence of gingivitis (calculated as a proportion of any GI mean score > 0), the extent of gingivitis (site prevalence – proportion of gingival surfaces affected by gingivitis[21], and the gingival bleeding prevalence (calculated as a proportion of any gingival bleeding[score 2 and 3 of the GI] present in at least one gingival surface). To calculate a true value of the site prevalence, the second molars were excluded because they were frequently missing.

Gingival Scores by age and Gender: Boys had a higher gingivitis prevalence and higher gingival and plaque scores than girls. The prevalence of gingival bleeding was seen to be more in boys than girls and was progressively increasing from 11 to 14 years.

Gingival scores in Relation to Economic, Educational status and schools Dental Services

Children who did not live in overcrowded households, or whose parents had a university degree displayed better gingival health.

DISCUSSION

Two important factors were associated to gingivitis in this life period: social gradient and gender. Social gradient was measured in our study by living standard (household density) and parental schooling, both being associated with gingival condition. This is not surprising as many studies underline this association. Chiapinotto *et al*., for example, discovered a close relationship between children's social gradient (household income and maternal schooling) and the extension of gingivitis (3). However, this relations a part of a general background, which places periodontal diseases in aclose relation with different indicators of social gradient such as family income and education, type of housing, number of cars owned, etc. [(13).]To minimize the periodontal risk of these children, it is imperative to measure the social gradient from the beginning by using social surveys. After the community social background was defined, special preventive and interventional programs must be designed and developed. These programs should be based on a strategy for reduction of oral health disparities, which includes financial support for dentistry needs, expanding public health programs, community collaboration and authorities' involvement, alternative delivery systems such as mobile dentistry, etc. It is well known that boys display worse gingival condition but they reach maximal gingival inflammation later than girls according to their puberty [(8).] Sutcliffe found a peak of prevalence at about the age of 12, a maximum of the site prevalence between 12 and 13 years for girls and between 13 and14 years for boys). Similar results have also been found in our study. The variation in gingival inflammation scores might be explained by the shifts in levels of steroids produced in puberty, which influences gingival inflammation through [(9):] stimulation of blood circulation in the gingival terminal blood vessels, which increases gingival bleeding [(6);] alterations in the plasma endothelial lining in the post-capillary venules increases of bacterial species such as P. intermedia and Capnocytophaga [(6,9);] and increases in plaque accumulation due to a high number of teeth(sites) [(8).] Public dental services in schools are another specific factor for children, whichare associated with both, caries experience and gingival condition. Namely, students who do not have direct access to school dental services displayed worse oral health Another questionable item is the intra-oral distribution of gingivitis.

While some studies found the interproximal papillae and the anterior teeth more frequently and severely affected by gingivitis [(8,9,)] others found that lower and upper molars are most affected [(8).] Ady *et al*.for example, showed that canines and premolars are better cleaned and brushed, which can be the reason forth incisors and molars being more affected by gingivitis. The authors also noted that the upper molars present more gingival inflammation in both buccal and mesial sites due to the presence of the coronoid process, which can create some difficulties in tooth brushing technique. Ady *et al*. stated that right teeth are more affected than their counterparts from the left side (right-handers group) Except the upper posterior teeth, we found the same result and this exception could be explained probably by different brushing start positions or may also be a chance result.

Our study has some limitations. For example, scoring every gingival surface of all teeth (not only Ram fjord's)and all stages of gingivitis, including erythema, the risk of errors in both, periodontal exam and data recording, can be slightly increased, but it was a good way to obtain a true prevalence of gingivitis. Moreover, also because of this, the prevalence discovered here may be somehow overestimated compared to other studies. The fact that one single examiner conducted all the examinations, and because he was not periodically re-calibrated, even if he was an experienced one, could also lead to some bias. The data about social class and family income were collected from the questionnaires that children had to answer. This and the fact that household density and affiliation to city regions (used in sampling method) are indirect measures for social background can provide some bias in relation to the data collection process. However, to minimize this,the questionnaire was specially designed for children based on simple questions about education (university diploma) and household density.

OBSERVATION AND RESULTS

Table 1 Gender distribution of study subjects

Gender	Frequency	Percentage
Boys	129	53.1
Girls	114	46.9
Total	243	100

Table 2 Plaque and gingival scores in relation to gender, age, living standard and dental services rendered

Parameter		PI		GI	
		Mean	SD	Mean	SD
Gender	Boys	0.237	0.174	0.768	0.169
	Girls	0.161	0.281	0.533	0.124

	P-value	0.004*		<0.001*	
Age (years)	11 Yrs	0.184	0.217	0.671	0.316
	12 Yrs	0.172	0.312	0.632	0.347
	13 Yrs	0.205	0.229	0.651	0.421
	14 Yrs	0.214	0.265	0.664	0.394
	P-value	0.831		0.937	
Living Standard	Good	0.172	0.165	0.642	0.265
	Poor	0.238	0.173	0.726	0.336
	P-value	0.007*		0.028*	
Dental Services	Rendered	0.153	0.101	0.614	0.315
	Not Rendered	0.249	0.188	0.797	0.408
	P-value	<0.001*		<0.001*	

Statistically Significant Difference (P-value<0.05)

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