

Original Article

The Prevalance and Risk Factors of Gingivitis Among the Children Referred to Isfahan Islamic Azad University (Khorasgan Branch) Dental School, In Iran

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ABSTRACT

Introduction: The effects of periodontal diseases observed in adults have earlier inception in life period. Gingival diseases in a child may progress to jeopardize the periodontium in adult hood. Therefore, periodontal diseases must be prevented and diagnosed early in the life. Periodontal diseases risk factors must also be identified. The aim of this research was to find the prevalence and identify the risk factors of gingivitis among the children referred to Isfahan (Khorasgan) Azad University Dental School Clinic, Isfahan, Iran.

Methods and Materials: In this research, the prevalence of gingivitis and its related risk factors were determined in 360 school children referred to Isfahan Azad University Dental School clinic. A questionnaire was filled for each student in which some information regarding their parent's education level, family income, and their school results were obtained. The habit of mouth breathing was also assessed. Then gingival, plaque, and oral hygiene indices were determined and recorded for each student.

Results: The prevalence of gingivitis was 73% among the children. With increasing the age from 6 to 11, the severity of gingivitis was increased. In all age groups, level of oral hygiene was superior in girls. Poor oral hygiene, mouth breathing, lower family income, and lower level of mother's education had negative effects on gingival health.

Discussion: The high prevalence of gingivitis observed in this research showed that comprehensive educational, preventive, and therapeutic oral hygiene programmes are needed to be planned from early school years.

Keywords: Gingivitis, Risk Factors, Prevalence.

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Introduction

The effects of periodontal diseases in adults have earlier inception in life period¹. Untreated gingival diseases in child hood, may progress to severe form of periodontal diseases in adult hood^{2,3}.

Therefore, diagnosis and treatment of gingivitis in early ages is important.

In developed countries, the prevalence and severity of gingivitis are widely studied at different ages. The prevalence of gingivitis in children has reported from 61.5 % in the USA⁴ to 85 % in Australia⁵, 70% in Mexico⁶, and 95% in India⁷. Chronic mild gingivitis is the most

common form of periodontal diseases observed in children⁸.

Although the prevalence of gingivitis in children is widely studied at different ages in developed countries, there is little information about severity of gingivitis in school children in Iran.

Dental plaque is the main cause of gingivitis. However, other factors such as systemic diseases, hormonal changes, sex, age, and economic conditions may also influence the response of gingival tissues to dental plaque⁹.

Therefore, the aim of this research was to find the prevalence and risk factors of gingivitis in school children in Isfahan, Iran.

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Methods and Materials

In this research, 360 school children (aged 6-11 years old) were randomly chosen from ones who were referred to Isfahan (Khorasgan) Islamic Azad University dental clinic. Children were equally divided in 6 age groups.

A questionnaire was filled by each student's parents, in which comprehensive information regarding family income, children's school results, and level of mother, and father's education were obtained. The habit of mouth breathing was also assessed.

During clinical examination, at first, gingival surface was dried. Then gingival index¹⁰, plaque index¹¹, and oral hygiene indices¹² were determined for each child.

The correlation between gingival index score and gingival condition is shown in table 1.

Table 1. Correlation between gingival index score and gingival condition.

Gingival Index	Gingival condition
0-1	Good ⁺
1.1-2	Medium*
2.1-3	Bad*

⁺Good: no gingivitis is present.

*Medium and Bad: gingivitis is observed.

After collecting all necessary information and clinical examinations, Chi-square, ANOVA, and student t-test were used for statistical analysis.

Results

Overall, only 27.22 % of children had good gingival conditions (no signs of gingivitis were

Table 2. Mean of gingival (GI) and oral hygiene Indices(OHI) in all children at different ages

Age	Number	Mean of GI	SD	Mean of OHI	SD
6	60	1/016	0/4	1.941	0/75
7	60	1/086	0/33	1.986	0/78
8	60	1/195	0/31	2.172	0/72
9	60	1/232	0/34	2.142	0/71
10	60	1/315	0/47	2.198	0/72
11	60	1/398	0/54	2.225	0/67

seen); whereas 72.78 % of children had medium or bad gingival conditions (signs of gingivitis were observed). In children with good oral hygiene, 22.78% were boys and 31.67% were girls.

Table 2 shows that mean gingival index (GI) was increased from 6 to 11 years old of age. This increase was observed in both sexes (boys and girls). The rise in gingival index with in-

creasing age was statistically significant ($P < 0.05$).

Mean of OHI was also increased from 6-11 years old of age in boys. In girls, however OHI was increased from ages of 6-8 and decreased from 8-11. ANOVA test revealed that there was no statistically difference in OHI between boys and girls at different ages ($P > 0.05$).

Table 3. The relation between mouth breathing (MB) and gingival condition (GC).

MB	GC		good		medium		Bad		total	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
Present	17	13.28	98	76.56	13	10.16	128	35.56		
Not present	81	34.91	145	62.50	6	2.59	232	64.44		
total	98	27.22	243	67.50	19	5.28	360	100		

Table 3 shows that 35.56 % of children had mouth breathing in which only 13.28 had good gingival condition; whereas this rate (good gingival condition) was 34.91% for children who did not have mouth breathing. 32% of boys had

mouth breathing habit in which only 11.86% had good gingival conditions. Among the girls, 38.33 % had mouth breathing habit in which only 14.49 % had good gingival conditions. Using chi-squares test, there was a direct

Table 4. The relation between level of mother's education (LME) and gingival condition (GC).

LME	GC	good		medium		Bad		total	
		No.	%	No.	%	No.	%	No.	%
High		15	53.57	12	42.86	1	3.57	28	7.78
Medium		38	44.26	82	54.10	2	1.64	122	33.89
Low		31	29.60	115	66.45	6	3.95	152	42.22
Uneducated		14	14.14	34	58.62	10	17.24	58	16.11
Total		98	27.22	243	67.50	19	5.28	360	100

relationship between mouth breathing and gingivitis in both sexes ($P<0.05$).

Table 4 shows that the best gingival condition was observed in children with highly educated mothers (53.57%). The worst gingival

conditions were observed in children with low or non educated parents. A statistically significant relationship was observed between level of mothers' education and good gingival conditions ($P<0.05$).

Table 5. The relation between family income(FI) and gingival condition(GC).

FI	GI	good		medium		bad		total	
		No.	%	No.	%	No.	%	No.	%
Good		38	66.67	19	33.33	0	0	57	15.83
Medium		48	38.40	74	59.20	3	2.40	125	34.72
Weak		12	6.74	150	84.27	16	8.99	178	49.45
Total		98	27.22	243	67.50	19	5.28	360	100

Table 5 shows that in 66.67% of children with high economic level, gingival condition was good; whereas, good gingival condition was observed in 38.4% of medium and only in 6.74 % of low economic classes. A direct relation was observed between child's family income and gingival condition ($P<0.05$).

Discussion

The results of this research showed that the prevalence of gingivitis was about 73% among the children between 6 and 11 years of old. This rate raises with increasing in age from 6 to 11. The prevalence of gingivitis was more in boys than girls, but this difference was not statistically significant. This result agrees with results of Kelly and Sanchez study¹³, but Marshal and Magnusson study¹⁴ showed that the prevalence of gingivitis was more in boys and this difference could be due to social and ethnical differences.

The results of this research also showed that oral hygiene negligence was the most important

factor in developing gingivitis in both sexes at different ages which is in agreement with most of the similar studies.

In all age groups, oral hygiene was superior in girls than boys which is in agreement with the Khordy study¹⁵ and may be due to the fact that girls are more concerned about their oral hygiene and they perform oral hygiene procedures more precisely.

This research showed that mouth breathing habit had direct effect on gingival inflammation. This is also in agreement with the study of Jacobson¹⁶ and could be explained by dehydration of exposed surface of gingiva during mouth breathing at night.

One interesting result of this research was that the level of mothers' education had positive influence on gingival health of the child. This finding shows that the higher educated mothers can influence their child's attitude about oral hygiene procedures.

The child's family income had direct influence on gingival condition. This finding is also in agreement with results of Griffiths and Addy¹⁷ and similar studies.

Limitations:

1-Hormonal changes during puberty and menstrual cycle aggravate the gingival response to local factors. Pronounced inflammation, edema, and gingival enlargement result from local factors that would ordinarily cause a comparatively mild gingival response. The effect of hormonal changes on gingival tissues may influence some of gingival indices measured in girls.

2-During mixed dentition, partially exfoliated, loose deciduous teeth could often cause some degree of gingivitis. This factor also may have some effects on gingival indices measured in both sexes.

Conclusion:

The high prevalence of gingivitis observed in this research showed that comprehensive educational, preventive, and therapeutic oral hygiene programmes are needed to be planned from early school years. Factors like oral hygiene, sex, mouth breathing, level of mother's education, and family income have direct influence on children gingival health.

References

- 1- Caranza FA, Newman MG. Carranza's Clinical Periodontology. 9th ed. Philadelphia: WB Saunders; 2002. p.308.
- 2- Califano JV; American Academy of Periodontology--Research, Science and Therapy Committee; American Academy of Pediatric Dentistry. Periodontal diseases of children and adolescents. *Pediatr Dent.* 2005-2006;27(7 Reference Manual):189-96.
- 3-Matsson L,Goldberg G. Gingival inflammatory reaction in children at different ages. *J.Clin.Periodontol.* 1985;12(2):98-103.
- 4-Bhat M. Periodontal health of 14-17-year-old US schoolchildren. *J Public Health Dent.* 1991;51(1):5-11.
- 5-Spencer AJ, Beighton D, Higgins TJ. Periodontal disease in five and six year old children. *J Periodontol.* 1983;54(1):19-22.
- 6- Juarez-Lopez ML, Munieta-Pruneda JF, Teodosio-Procopio E. Prevalence and risk factors for periodontal disease among preschool children in Mexico city. *Gac Med Mex.* 2005;141(3):185-189.
- 7-Varma BRR, Nayak RP. Current concepts in periodontics. 1st ed. SA Medi Publishing House; 2002. p.106.
- 8- Masiga MA. Socio-demographic characteristics and clinical features among patients attending a private paediatric dental clinic in Nairobi, Kenya. *East Afr Med J.* 2004;81(11):577-82.
- 9- Peretz B, Bimstein E, Macheti EM. Periodontal status in childhood and early adolescence. *J Clin Pediatr Dent.* 1996;20(3):229-32.
- 10- Loe H, Silness J. Periodontal Disease In Pregnancy. I. Prevalence And Severity. *Acta Odontol Scand.* 1963;21:533-51.
- 11- Silness J, Loe H. Periodontal Disease In Pregnancy. Ii. Correlation Between Oral Hygiene And Periodontal Condition. *Acta Odontol Scand.* 1964;22:121-35.
- 12- Greene JC, Vermillion JR. The Simplified Oral Hygiene Index. *J Am. Dent. Assoc.* 1964;68:7-13.
- 13-Kelly JE, Schez MJ. Periodontal disease and oral hygiene among children. *Vital Health Stat 11.* 1972;(117):1-28.
- 14- Marshall-day CD, Stephens RG, Quigley LFJ. Periodontal disease: prevalence and incidence. *J Periodontol* 1955; 26(3):185-203.
- 15-Khordymod M. Evaluation of gingival and oral hygiene conditions of 6-13 years school children in Mashhad Iran. *Mashhad Medical Journal.* 1990;12:7-14.
- 16- Jacobson L. Mouthbreathing and gingivitis. I. Gingival conditions in children with epipharyngeal adenoids. *J Periodontal Res.* 1973;8(5):269-77.
- 17- Addy M, Griffiths G, Dummer P, Kingdom A, Shaw WC. The distribution of plaque and gingivitis and the influence of toothbrushing hand in a group of South Wales 11-12 year-old children. *J Clin Periodontol.* 1987;14(10):564-72.