

Prevalence of gingival stippling in children

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Gingival stippling is a characteristic of the healthy attached gingiva and its diminution or loss has been considered as a sign of gingival disease. The clinician however, must take in consideration that its pattern and extent varies in different mouth areas, among persons and with age. Reports on the prevalence of stippling in children are few and inconsistent. Therefore, the purpose of the present study was to describe the prevalence of gingival stippling in children of various ages. Fifty-five high quality anterior oral color slides of children (25 girls and 30 boys) aged 1 to 10 years, were examined for the presence of stippling. The average age of the study population was 5.1 years (S. E. = 0.3). The overall prevalence of stippling was 56.4%. Analysis of the differences between boys and girls in age (t-test) or the prevalence of stippling (Chi square) did not indicate statistical significance ($p > 0.05$). Stippling was evident from 3 years of age and thereafter, with no particular trend of change with age. Stippling was found in 47.2 % of the maxillary areas, in 41.7% of the mandibular areas, and in 26.1% in both arches of the same child. The differences in distribution of stippling by gender and arch were not statistically significant (Chi square, $p > 0.05$). In conclusion, gingival stippling was found to be a normal characteristic in 56.3% of 3 to 10-year-old children, without significant differences in prevalence related to arch, gender or age.

J Clin Pediatr Dent 27(2): 163-166, 2003

INTRODUCTION

Gingival stippling, the “orange peel” appearance of the healthy gingival surface is characteristic of the attached gingiva, while stippling of the marginal gingiva is an “exception to the rule”.¹ In general, diminution or loss of gingival stippling has been described as a common sign of gingival disease, as it negatively relates with inflammation that expands from the marginal to the attached gingiva.^{1,4} Furthermore, when the gingiva is restored to a healthy condition, gingival stippling becomes evident again.¹ Yet, the use of gingival stippling as a diagnostic sign is limited by the fact that it is unique for each person: its pattern in size and quantity varies by gender, age and area.^{1,2,5} Therefore, in order to use gingival stippling effectively as an effective diagnostic aid, it is necessary to first determine its characteristics.

A review of the literature related to gingival stippling in children revealed few and inconsistent information on its prevalence.^{1,3,6} Therefore, the purpose of the present study was to describe the prevalence and distribution of gingival stippling in children of various ages.

POPULATION AND METHODS

Anterior oral slides of children, which were taken as a routine part of the dental record by one author (B. P.), or as part of the follow up of trauma cases that did not include luxation injuries, were examined. The slides were projected with the same projector, to the same screen in a fixed distance, and with the same zoom setting. One author (E. B.) selected one slide per child based on the following criteria: 1) accurate data of the child's age and gender; 2) a clear image of the anterior gingival area in at least one arch; 3) none or minimal marginal gingival inflammation; 4) no evidence of pulp pathology in the soft tissues. The slides of 25 girls and 30 boys aged 1 to 10 years (Table 1) fulfilled the required criteria; a clear image of the gingival area was evident in the maxilla of 53 children, in the mandible of 48 children, and in both arches in 46 children.

The presence of stippling in each arch, and the child's age and gender were recorded. A personal computer statistical program (JMP version 3.2.6, SAS institute 1999) was utilized for the statistical examination that included: a) t-test to examine the significance of the difference in age between boys and girls; b) Chi square to

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Table 1. Distribution of children by age in years and gender

	Age										Total	Mean	SE
	1	2	3	4	5	6	7	8	9	10			
Females	0	4	0	4	3	3	7	3	0	1	25	5.6	0.4*
Males	2	1	7	6	3	4	6	1	0	0	30	4.6	0.4*
Total	2	5	7	10	6	7	13	4	0	1	55	5.1	0.3

* Statistically not significant difference, t-test, $p>0.05$.

Table 2. Presence of stippling by child and age and by arch and age

	Age in years										Total	%
	1	2	3	4	5	6	7	8	9	10		
By child												
No stippling	2	5	3	4	1	1	4	4	0	0	24	56.4*
Stippling	0	0	4	6	5	6	9	0	0	1	31	43.6*
Total	2	5	7	10	6	7	13	4	0	1	55	100.0
Maxilla												
No stippling	1	5	5	7	1	1	5	3	0	0	28	25.8*
Stippling	0	0	2	3	5	6	7	1	0	1	25	47.2*
Total	1	5	7	10	6	7	12	4	0	1	53	100.0
Mandible												
No stippling	2	3	4	4	1	4	6	3	0	1	28	58.3*
Stippling	0	0	3	4	5	2	6	0	0	0	20	41.7*
Total	2	3	7	8	6	6	12	3	0	1	48	100.0

* Statistically not significant difference, Chi square, $p>0.05$.

Table 3. Distribution of stippling by gender*

	Females	Males	Total
No stippling	12	12	24
Stippling	13	18	31
Total	25	30	55

* Statistically not significant difference, Chi square, $p>0.05$.

examine the significance of the differences in distribution of stippling by age, gender, arch, and by arch and gender.

RESULTS

The difference in age between boys and girls in the study population was not statistically significant (Table 1). Gingival stippling was evident in: a) 3-years-old boys (Figure 1) and of 4-years-old girls and thereafter; b) at least one arch in 56.4% ($n=31$) of the whole study population; c) 52% ($n=25$) of the girls; d) 60% ($n=30$) of the boys; e) 47.2% ($n=25$) of the maxillary areas; f) 41.7% ($n=20$) of the mandibular areas; g) 26.1% ($n=12$) in both arches (Tables 2 and 3). There were no statistically significant differences in the distribution of gingival stippling by age in the whole sample or in both arches (Table 2). The differences in distribution of gingival stippling by gender, by arch and by arch and gender (Tables 3, 4 and 5 respectively) were not statistically significant.



Figure 1. Photograph of the anterior oral area of a 3-year-old boy. Gingival stippling is evident in the mandibular attached gingiva.

Table 4. Distribution of stippling by arch*.

	Maxilla	Mandible	Total
No stippling	28	28	56
Stippling	25	20	45
Total	53	48	101

* Statistically not significant difference, Chi square, $p>0.05$.

Table 5. Distribution of stippling by arch and gender.

	Maxilla*			Mandible*		
	Females	Males	Total	Females	Males	Total
No stippling	11	15	26	12	16	28
Stippling	13	12	25	9	9	18
Totals	24	27	51	21	25	46

* Statistically not significant difference, Chi square, $p>0.05$.

DISCUSSION

Previous studies on gingival stippling in children are few and provide inconsistent data on the age of onset of gingival stippling in children. Greene¹ and Glickman² described it to first be evident at age 6 years, Soni *et al.*³ described it as being first evident at age 5 years in girls and 6 years in boys and, Magnusson *et al.*⁷ wrote that it develops slowly from ages 2 to 3 years.

The present study confirms the fact that gingival stippling may be evident in infancy, from age 3 years. The differences between the studies may be the result of different criteria, material and methods. For example, Soni *et al.*³ examined gingival biopsies of children aged 5 to 13 years; therefore, they could not establish the presence of stippling at an earlier age. In addition, the sample included only 3 biopsies of 5-year-old boys. It is possible that with the inclusion of an adequate number of gingival biopsies of children aged 5 years or

less, the findings and conclusions would have been different. Similarly, in the present study no females aged 3 years were included, therefore, we cannot conclude that stippling is not evident in this age in females.

Reported prevalence values for gingival stippling in adults indicate that it may normally be evident in 40% of adults.⁸ Similarly, Carranza indicates that the prevalence of gingival stippling in children aged 5 to 13 years is 35%.⁶ Soni *et al.* in an histological study of the gingiva of 102 children aged 5 to 13 years, indicated that stippling was present in 40.91% in girls and in 31.03% in boys.³ Higher prevalence values were found in the present study: 56.4% in the whole population, 52% in girls and 60% in boys. The difference in the prevalence values may be related to differences in population characteristics or methodology.

Greene¹ quotes Orban (1957) as stating that the disappearance of gingival stippling is often thought to be one of the earliest clinical signs of disease, when the inflammatory process extends from the free margin into the attached gingiva. However, as indicated previously^{3,6,8} and in the present study, gingival stippling may normally be absent in healthy attached gingiva. Therefore, only disappearance of stippling, and not the lack of stippling, may be considered as a sign of disease.

The present finding that there was no statistical difference in the distribution of gingival stippling in the maxilla and the mandible is in agreement with previous studies that indicate a relation in the presence of gingival stippling in different areas of the mouth.^{1,5}

It has been previously reported that gingival stippling varies with age and gender, it is absent in infancy and increases with age until adulthood.^{5,9}

In the present study however, we did not find evidence of an increase in the prevalence of gingival

stippling with age, and no statistical significant difference was found in prevalence between boys and girls. These finding however, may be related to the fact that the number of individuals in each age group in the present study was small. Therefore, a larger study group is required to reach definitive conclusions on these issues.

CONCLUSION

Gingival stippling was found to be a normal characteristic in the healthy attached gingiva of anterior teeth, in 56.4% of children (n=55) aged 3 to 10 years.

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