Journal of Pakistan Association of Dermatologists. 2023;**33(4)**:1330-1334.

Original Article

Gingivitis and enamel defect among students of Dentistry College in Babylon, Iraq

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Abstract

Objective The aim of this study was to measure the oral hygiene problem (dental plaque and measure the severity and prevalence of gingival disease) and enamel defects among 22-23 years old students of dentistry college in Babylon Iraq.

Methods A representative sample included in this study consisted of 300 students, they were selected randomly. Dental plaque was measured using Silness and Loe (1964) plaque index. The gingival health condition was measured using Loe and Silness (1963) gingival index, while enamel anomalies were measured following the criteria of WHO.

Results The mean value of plaque index of total sample, for females was 1.11 and male is 1.47 the mean value of gingival index of female was 1.027 and male was 1.30 with statistically, no significant difference (P value >0.05), the enamel defect prevalence was 29%. The most prevalent type of enamel anomalies was demarcated opacity (12%) followed by diffused opacity (10%).

Conclusion Demarcated opacity was common type of enamel defects. The demarcated opacity is a defect include change in the translucency and has a clear boundary with the adjacent normal enamel. The color may be white, cream, brown or yellow.

Key words
Gingivitis; Enamel defect; Oral hygiene.

Introduction

Periodontal disease is disease that involves the gingival and periodontal tissue those surrounding and supporting teeth. It was divided into two types: gingivitis and periodontitis.[1-4]

Gingivitis is the most common type of periodontal disease. It refers to inflammatory reactions confined to marginal gingival tissues with no obvious loss of bone or connective tissue attachment.[5] It is a reversible condition which may begin in young age and may increase in severity with age.[6,7] If untreated, may lead to periodontitis (irreversible) and finally loss of teeth.[8] Dental plaque is bacterial collection with their products accumulate on the teeth or other oral structures.[9] Plaque is the main cause for gingivitis and periodontitis.[10,11] Enamel defects "any defect in the hard tissue of teeth that occur duo to any disturbances in process of odontogenesis" these defects presenting clinically as enamel hypoplasia or decrease in

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the enamel thickness or hypomineralization apparent as enamel opacity, demarcated or diffuse opacity.[12]

In addition to esthetic problems, enamel anomalies responsible for dental sensitivity, occlusal function and predisposing factor to tooth erosion and wear.[13-15] Additionally, these defects regarded as predisposing factors for dental caries.[16] Additionally, there was no previous epidemiological study concerning oral health status for fifth and four stage of Babylon dentistry, therefore, this study was conducted to gain knowledge concerning oral health status (oral hygiene, gingival condition, and enamel defects) among 22-23 years old students of dentistry college in Babylon city which allow for comparing results with the results of other studies in Iraq and other communities

Methods

The representative sample included 22-23 years old male and female students of dentistry college in Babylon city of Iraq. It included 300 students. Each student with systemic diseases, married, uncooperative or have orthodontic appliance were not included in examination. Plaque index of Sinless and Loe[17] Dental plaque, Gingival index of Loe and Silness[18] was used for assessing gingival health condition, while, enamel anomalies followed the criteria of WHO.[6] Analysis of these data were done using (SPSS) version-21. Statistical t-test, and Pearson correlation (r) used to test the differences between results. P-values less than 0.05 were considered as statistically significant.

Result

The distribution of the sample is illustrated in **Table 1**. The total sample numbers is 300 and the female percentage was 51% and male percentage was 49%.

Table1 Distribution of total sample by gender.

Gender	*No*	*%*
Female	152	51%
Male	148	49%
Total	300	100%

Table 2 Plaque index (mean and standard deviation) among dental students by gender.

PI	*Mean ±SD*	*p value*	*df*	*t test*
Female	1.11±0.88	0.226	298	1.6
Male	1.47±0.954			
Total	1.29			

N.S= Not significant.

In **Table 2**, the mean of dental plaque was 1.29 and mean of gingival disease was 1.16.

Regarding gender, values of plaque mean for male1.47 and for female is 1.11, the mean of plaque index higher in male than female with no significant difference.

In **Table 3**, values of mean of gingival index in male is 1.30 and in female is 1.02. The mean of gingival index higher in male than female with no significant difference.

Table 4 illustrated the correlation coefficient between plaque and gingival indices among students for the total sample. The data showed that there were statistically highly significant and strong positive correlations between indices of plaque and gingival condition for both male and female students of total sample.

Table 3 The gingival index (mean and standard deviation) among dental students by gender.

GI	*Mean±SD*	*p value*	*t test*
Female	1.027±0.81	0.837	1.66
Male	1.30±0.98		

N.S= Not significant

Table 4 Correlation coefficient among plaque index and gingival indices among dental students.

Gender	*r*	*P*
Female	0.70	
Male	0.710	0.000 (H.S)
Total	0.708	

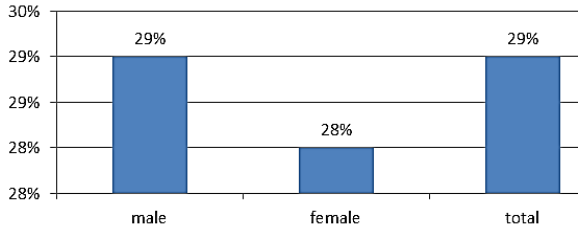

Figure 1 The enamel anomalies by gender.

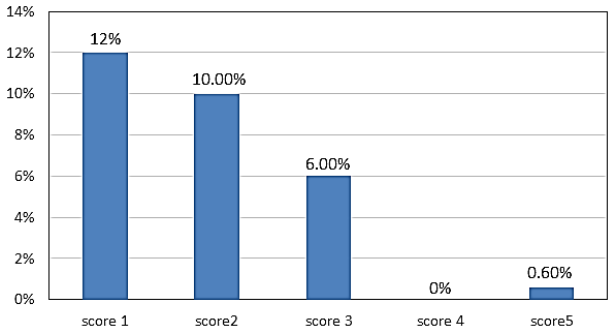

Figure 2 The scores of enamel defect.

Figure 1 Distribution of total sample with enamel anomalies by gender, the prevalence of enamel defect was 29%. In male was 29% and in female was 28%.

Figure 2 distribution of total sample according to scores of enamel defect, the most prevalent type of enamel anomalies was demarcated opacity (12%) followed by diffused opacity (10%).

Discussion

This study was the epidemiological study conducted in Babylon city for concerning oral health status (gingival health status and enamel anomalies) among male and female dental students, thus the result of this study can be compared with the result of other epidemiological studies which follow the same criteria. The amount of dental plaque in individuals varies duo to differences in their methods of tooth brushing[19] and diet.[20] Variation among studies may be related to differences in the design of the study, and/or in the diagnostic criteria. Additionally, the prevalence of gingivitis is affected by many factors including gender, the presence of plaque, genetic, behavioral,[21-23] socioeconomic, cultural, and geographical factors.[21] The high percentage of dental plaque explain the high percentage of gingivitis as dental plaque proven a prime inducer of gingivitis.[24] The same correlation was also reported by other study.[21] Additionally, the high percentage of gingivitis because other causes like hormonal changes,[25-29] or less attitude to visit dental clinic, and they may brush in an incorrect way, however this explanation needs to be confirmed in future study concerning oral hygiene practices. It has been well supported that dental plaque formation increase during gingival inflammation in which the gingival fluid, during inflammation, increases the supply of nutrients for bacteria that forming plaque.[24] The value of gingival index mean was higher than that reported by some studies,[30] but lower than the study.[31] The value of plaque mean index was higher than study,[31] varies in gender, in male higher plaque than female.[32]

Concerning gender, the mean value of gingival index was found to be increased in male than female because of that men have poorer oral hygiene habits, ignore their oral health, higher rates of gingival and periodontal disease.[32] Men also less frequently visit dentists and compared to women seeking oral management. Women show more positive attitudes to visit dental clinic, greater care of oral health, and better behaviors of oral health than men. Men, have periodontal diseases because a combination of reasons, including poorer oral hygiene behaviors, immune system factors, hormone differences, more tobacco use and smoking. The same finding was reported by some studies.[32] It was proven by different observational and experimental works that dental plaque is a prime inducer of gingivitis[24] and these both conditions get worse in men for the same cause.[32] In this study, the prevalence of enamel anomalies was

29% and there was no previous studies in dental students to compare the result with. Several etiological factors lead to enamel defects in the permanent teeth, and it was found that the increased enamel defects risk in permanent teeth is duo to the critical period of amelogenesis from birth to two years of age, when the child had a number of systemic conditions that can affect development of enamel[13] however the cause of enamel defects in permanent teeth may be duo to local factors such as damage (infection or trauma) to its primary predecessor, systemic factors such as malnutrition, which is an insufficient supply of essential components (proteins, mineral, vitamins and salts) environmental or genetic, or other factors.[27,28] Additionally, authors said that systemic conditions, such as respiratory disorders, low birth weight, and regular consumption of antibiotic, are associated with dental enamel defects.[29,30] Further studies are needed concerning studying the causes and factors related to enamel defect among those students. Demarcated opacities were occur because defect in matrix degradation process, that may be happen during matrix formation stages, to providing suitable conditions for the beginning of maturation.[33-35] Furthermore, other factors of demarcated enamel defects was infection.[34]

Conclusions

Demarcated opacity was common type of enamel defects. The demarcated opacity is a defect include change in the translucency and has a clear boundary with the adjacent normal enamel. The color may be white, cream, brown or yellow.

References

1. Gelbier S, Robinson PG. Dental public health Oxford Textbook of Public Health. 2011.
2. Kostadinović, L.B., Apostolović, M.S., Igić, M.L., Tričković-Janjić, O.R., Aleksić, B.S. Correlation of the prevalence of gingivitis in children of diff erent age and gender. Acta Stomatologica Naissi. 2011;27 (64), pp. 1084-1096.
3. Igić M, Draganb M, Ljiljanac K, Mirjanaa A, Ljiljanaa K, Dušana S, Tričkovića JO, Branislava S. Cytomorphometric and clinical assessment before and after the treatment of chronic catarrhal gingivitis in children. Acta Stomatologica Naissi. 2010;26(61):945 – 952.
4. Radojkova-Nikolovska VS, Mirjana FP, Ana BM, Vera TS, Biljana LD, Pavlina EA, Aneta S A, Ana IB, Bruno IN. The influence of estrogen on the gingival health of girls. Acta Stomatologica Naissi. 2014;30(70):1393 – 1407.
5. Damle SG. Textbook of pediatric dentistry. 3 rd ed. ARYA (MEDI) Publishing House, 2009.
6. World Health Organization. Oral health surveys: basic methods. 4th ed. Geneva, Switzerland, 1997.
7. Rao A. Principle and practice of pedodontics. 2nd ed. New Delhi. 2008.
8. Dean J, Avery D, McDonald R. Dentistry for the child and adolescent. 9th ed. Mosby, Elsevier, China, 2011.
9. Noble S. Dental hygiene and therapy clinical textbook. 2nd ed. Pondoicherry; India, 2012.
10. Vadiakas G, Oulis CJ, Tsinidou K, Mamai-Homata E, Polychronopoulou A. Oral hygiene and periodontal status of 12 and 15-year-old Greek adolescents. A national pathfinder survey. Eur Arch Paediatr Dent 2012; 13(1): 11-20.
11. Jessri M, Jessri M, Rashidkhani B, Kimiagar SM. Oral health behaviours in relation to caries and gingivitis in primary‐school children in Tehran. East Mediterr Health J 2013;19: 527-34.
12. Wong HM, McGrath C, King NM. Dental practitioners views on the need to treat developmental defects of enamel. Community Dent Oral Epidemiol 2007; 35:130-9.
13. Seow WK, Ford D, Kazoullis S, Newman B, Holcombe T. Comparison of enamel defects in the primary and permanent dentitions of children from a low-fluoride District in Australia. Pediatr Dent 2011; 33: 207-12.
14. Vargas-Ferreira F, Ardenghi TM. Developmental enamel defects and their

impact on child oral healthrelated quality of life. Braz Oral Res 2011; 25: 531-7.
15. Seow WK. Developmental defects of enamel and dentine: challenges for basic science research and clinical management. Aust Dent J 2014; 59(1):143–54.
16. Salanitri S, Seow WK. Developmental enamel defects in the primary dentition: aetiology and clinical management. Aust Dent J 2013; 58(2):133–40.
17. Silness J, Loe H. Periodontal disease in pregnancy. Correlation between oral hygiene and periodontal condition. Acta Odont Scand 1964; 22:121-35.
18. Loe H, Silness J. Periodontal disease in pregnancy I. Acta Odonto Scand 1963; 21:533-51.
19. Chrysanthakopoulos NA. Prevalence of gingivitis and associated factors in 13–16-year-old adolescents in Greece. Euro J General Dent 2016; 5(2): 58.
20. Qasim AA. Oral health status among secondary school students in Mosul City Centre/Iraq. Al–Rafidain Dent J 2007; 7(2): 180–5.
21. Kolawole KA, Oziegbe EO, Bamise CT. Oral hygiene measures and periodontal status of school children. Int J Dent Hyg 2011; 9: 143-8.
22. Al-Ahmed A, Roth D, Wolkewitz M, Wiedmann-AlAhmed M, Follo M, Ratka-Kruger P. Change in diet and oral hygiene over an 8-week period. Effects on oral health and oral biofilm. Clin Oral Investig 2010; 14:391-6.
23. Al–Ajrab M. Oral hygiene and gingival health status among teenagers population lived in Al–Rashidiya, Ninevah. Al–Rafidain Dent J 2005; 5(2):107-20.
24. López R, Fernández O, Baelum V. Social gradients in periodontal diseases among adolescents. Community Dent Oral Epidemiol 2006; 34:184‐96.
25. Kazemnejad A, Zayeri F, Rokn AR, Kharazifard MJ. Prevalence and risk indicators of periodontal disease among high ‐school students in Tehran. East Mediterr Health J 2008; 14:119‐25.
26. Dumetriscu AL. Etiology and pathogenesis of periodontal disease. New York, Springer 2010.
27. Layedh NMH. Oral health status in relation to nutritional status among a group of 13-15 years old intermediate school girls in Al-Najaf City / Iraq. Master thesis, College of Dentistry, University of Baghdad. 2016.
28. Jenkins WMM, Papanou PN. Epidemiology of periodontal disease in children and adolescents. Periodontol 2001; 26:16–32.
29. Rugg-Gunn AJ, Nunn JH. Nutrition, diet and oral health textbook. Oxford University Press.1999: 79-93.
30. Anthonappa RP, King NM. Enamel defects in the permanent dentition: prevalence and etiology. Springer-Verlag Berlin Heidelberg 2015.
31. Jälevik B, Norėn J, Klingberg G, Barregård L. Etiologic factors influencing the prevalence of demarcated opacities in permanent first molars in a group of Swedish children. Eur J Oral Sci 2001; 109(4): 230-4.
32. Li Y, Lee S, Hujoel P, Su M, Zhang W, Kim J, *et al*. Prevalence and Severity of Gingivitis in American Adults. Am J Dent. 2010 Feb; 23 (1): 9-13.
33. MURILLO G., VARGAS M., CASTILLO J., SERRANO J., RAMIREZ G., VIALES J., BENITEZ C., 2018: Prevalence and Severity of Plaque-Induced Gingivitis in Three Latin American Cities: Mexico City-Mexico, Great Metropolitan Area-Costa Rica and Bogota-Colombia.-ODOVTOS-Int. J. Dental Sc., 20-2 (May-August): 91-102.
34. Lipsky MS, Su S, Crespo CJ, Hung M. Men and Oral Health: A Review of Sex and Gender Differences. American Journal of Men's Health. May 2021.
35. Suga S. Enamel hypomineralization viewed from the pattern of progressive mineralization of human and monkey developing enamel. Adv Dent Res. 1989; 3: 188-198.