

Prevalence of dental erosion among 11-12 year old school children in Baghdad– Al- Rusafa side

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Abstract

Back ground: dental erosion is the irreversible loss of dental hard tissue by a direct acid attack which is due to chemical process not involving bacteria and not directly associated with mechanical or traumatic factors, or with dental caries.

The aim of this study is to determine the prevalence of dental erosion among the total sample which composed of 800 children.

Material and method: this survey was conducted on children aged between 11-12 year old in three primary schools in Baghdad – Al- Rusafa side. The school children participated in this study were 800 (380 boys and 420 girls), the affected group was consisting of (31) boys and (24) girls. The level of erosion was recorded by using modified tooth wear index (1994).

Results of this study showed that the prevalence of dental erosion was (6.87%), distributed as (3.13%) mild erosion, (2.5%) moderate erosion and (1.25%) severe erosion. Higher prevalence was found in boys (3.87%) than girls (3%) with significant difference.

A statistically significant difference ($P < 0.05$) is observed between means of affected facial and lingual/palatal surfaces with score 1, 2 and 3 respectively. The difference between the upper and lower facial surfaces and also between palatal and lingual surfaces was: highly significant ($P < 0.01$) for score 1, significant difference ($P < 0.05$) for score 2 and a non-significant difference ($P > 0.05$) for score 3. A non- significant difference

($P > 0.05$) is found between the upper and lower occlusal surfaces affected with score 1, 2, and 3 respectively.

Conclusion: the prevalence of dental erosion was higher in boys than in girls, which is due to higher consumption of acidic drinks and high frequency of carbonated drink intake.

Introduction

Dental erosion is the irreversible loss of dental hard tissue due to chemical process not involving bacteria and not directly associated with mechanical or traumatic factors, or with dental caries ⁽¹⁾.

The etiology of dental erosion depends on the presence of strong acids which are not coming from fermentation of carbohydrates by plaque microorganisms ⁽²⁾. There are two types of acids in the oral environment, extrinsic and intrinsic. The extrinsic sources of acids can be dietary, industrial, pharmacological and consumption of acidic foods and drinks or acidic medications, while the most common source of intrinsic acid is the regurgitation of gastric contents into the mouth as occurs in gastro esophageal reflux ⁽³⁾.

Material and method

This survey was conducted after getting approval of the schools authorities and after making a contact with them to explain the purpose of the study.

The school children participated in this study were (800 from both gender) aged between 11-12 year old. Three primary schools were chosen from Rusafa side, the names of the schools were placed in a bag, thoroughly mixed and were drawn under supervision of statistical adviser to ensure that they were representative of population under study. Clinical examination was performed in the class room under natural light with the aid of plan mouth mirror and explorer (no.0); the teeth were dried using cotton wools. The questionnaire forms especially designed for erosion were

given to each child in this study. The questions were listed in details and in an easy way to be understood by the parents and the teaching staff ensured that forms were completed and returned.

The surfaces of all teeth in the mouth were scored according to tooth wear index by Smith and Knight (1984)⁽⁴⁾ modified by Millward et al (1994)⁽⁴⁾.

0: no loss of enamel surface characteristic.

1: loss of enamel surface characteristic.

2: visible dentin less than one third of surface area.

3: visible dentin more than a third of surface area without exposing pulp or secondary dentin.

4: complete loss of enamel, pulp exposure or secondary dentin exposure.

The children with erosion were also classified into 3 groups:

Mild erosion includes score (1).

Moderate erosion includes score (2).

Severe erosion includes score (3 and 4).

The data analysis was carried using statistical package for social science (SPSS version 12.0). The analysis of data included:

- Classification of data and calculation of frequencies.
- Classification of statistical parameter (mean and standard deviation of the mean).
- T-test is the statistical test that was used in this study.

Results

This survey was conducted among school children aged 11-12 year old from three primary schools in Baghdad – Al- Rusafa side. Examination started at the 1st of October till the end of November 2010. The sample was consisting of (800) school children, (380, 47.5%) boys and (420, 52.5%) girls. The prevalence of dental erosion is shown in (Table1).

(Table2) demonstrates the prevalence of dental erosion according to gender, out of (31) were boys and (24) were girls. The difference was statistically significant ($P<0.05$).

The distribution of lesions demonstrated through the means of affected facial and lingual/palatal surfaces which are shown in (Table3) which illustrates a highly significant difference ($P<0.01$) in the means of affected facial and lingual/palatal surfaces with score 1.

A statistically significant difference ($P<0.05$) is observed between means of affected facial and lingual/palatal surfaces with score 2 and scores 3.

(Table4) is showing the means and SD of affected upper and lower surfaces of score 1, high significant difference ($P<0.01$) is seen between the upper and lower facial surfaces and also between palatal and lingual surfaces.

A significant difference ($P<0.05$) is observed between means of the upper and lower facial surfaces and also between palatal and lingual surfaces affected with score 2.

There is no significant difference ($P>0.05$) found between means of the upper and lower facial surfaces and also between palatal and lingual surfaces affected with score 3.

A non- significant difference ($P>0.05$) is found between the upper and lower occlusal surfaces affected with score 1, 2, and 3 respectively.

Discussion

The prevalence of dental erosion among 11-12 year old school children was found (6.87%), which comes in agreement with another researcher ⁽⁵⁾ of the same age group.

In this study, the prevalence of dental erosion was higher in boys than in girls which is due to higher consumption of acidic drinks by boys than girls as estimated from the questionnaire forms which were given to each child in this study. This result comes in agreement with many other studies ^(3, 5, 6, 7).

The means of affected facial surfaces were higher than lingual and palatal surfaces in score 1 with high significant difference and in score 2 and 3 with significant difference, this is due to high intake of carbonated drinks which act as a source of extrinsic acids ^(5, 6, 8, 9,10). The relationship between intrinsic acid and palatal surfaces erosion had been shown in dental literature ^(11,12) as regurgitation of gastric contents into the mouth (as occurs in gastro-esophageal reflux) is the most common source of intrinsic acid mainly HCl which explains the decrease in the occurrence of palatal and lingual erosion in the erosion patients of this study as none of them reported any gastric problem according to the questionnaire forms which were given to each child in this study ^(3, 13).

Higher mean of affected upper facial surfaces than affected lower facial surfaces and also between the affected palatal and lingual surfaces with high significant difference in score 1 and with significant difference in score 2 respectively. These findings are due to the fact that the thickest salivary pellicle occurred at the lingual surfaces of mandibular teeth which suggest that the thickness of the acquired pellicle is an important factor for the site specificity of dental erosion ⁽¹⁴⁾. The principle sites of contact of the erosive agent, protection of some sites by the tongue and saliva and the adverse effect of anatomical structures contacting the teeth have all been cited ⁽¹⁵⁾.

Although the means of affected facial surfaces with score 3 were higher in the upper than lower arch, the difference was non- significant, as the saliva, plaque and anatomical structures become less effective in severe acidic attack, as the saliva has a remineralizing effect on early enamel erosion, but frequent acidic attack may overcome the remineralizing action of the saliva rendering the tooth surface less resistance ⁽¹⁶⁾.

The occlusal surfaces showed a non- significant difference between the upper and lower arches in all grades as most of these surfaces were subjected to attrition ⁽⁵⁾.

References

1. Shaw L. Tooth wear: etiology, prevention, clinical implication. In: Murray JJ, Nunn JH, Steele JG, Eds. The prevention of oral disease. 4th edit. Walton Street, Oxford University press; 2003: 115-20.
2. Lewis DW, Ismail AI. Periodic health examination, 1995 update: 2. Prevention of dental caries. Canad Med Assoc J 1995; 152: 836-846.
3. Dugmore CR, Rock WP. The prevalence of tooth erosion in 12-years old children. Br Dent J 2004a; 196: 279-282.
4. Peter S. Indices in dental epidemiology. In: Peter S, ed. Essentials of preventive and community dentistry. 2nd ed. New Delhi, Arya publishing house 2004: 209.
5. AL-Dafaai RR. Dental erosion among 11-12 years old school children in Baghdad city (Iraq). M.Sc. Thesis. College of Dentistry, University of Baghdad, 2007.
6. AL-Gobory GH. Dental erosion among 11-12 years old school children in Mosul city. M.Sc. Thesis. College of Dentistry, University of Baghdad, 2004.
7. AL-Dlaigan YH, Shaw L, Smith A. Dental erosion in a group of British 14-year-old, school children. Part I: Prevalence and influence of

- differing socioeconomic backgrounds. *Br Dent J* 2001 b; 190 (3): 145-149.
8. Moazzez R, Smith BG, Bartlett D. Oral PH and drinking habits during ingestion of carbonated drink in group of adolescents with dental erosion. *J Dent* 2000; 28: 395-397.
 9. AL-Majed I, Maguire A, Murray JJ. Risk factors for dental erosion in 5-6 year old and 12-14 year old boys in Saudi Arabia. *Comm Dent Oral Epidemiol* 2002; 30: 38-46.
 10. Peres KG, Armenio MF, Peres MA, Traebert J, De Lacerda JT. Dental erosion in 12 year old school children: a cross-sectional study in Southern Brazil. *Int J Pediatr Dent* 2005; 15: 249-255.
 11. Bartlett DW, Evans DF, Anggiansah A. A study of the association between gastro-esophageal and palatal dental erosion. *Br Dent J* 1996; 181: 125-131
 12. Zero DT. Etiology of dental erosion-intrinsic factors. *Eur J Oral Sci.* 2006; 104: 162-77.
 13. Milosevic A, Bardsley PF, Taylor S. Epidemiological studies of tooth wear and dental erosion in 14- year old children in North West England. Part 2: The association of diet and habits. *Br Dent J* 2004; 197, 479-483.
 14. Amaechi BT, Higham SM, Edgar WM, Milosevic A. Thickness of acquired salivary pellicle as a determinant of the sites of dental erosion. *J Dent Res* 1999b (78): 1821-1828.
 15. Johansson AK. Dental erosion and associated risk factors. *Swed Dent J* 2002; 156: 177.
 16. Amaechi BT, Higham SM. Eroded enamel lesion remineralization by saliva as a possible factor in the site-specificity of human dental erosion. *Arch Oral Biol* 2001; 46: 697-703.

Table (1) Prevalence of dental erosion

Severity	Boys	Girls	Total	prevalence
Mild	12	13	25	3.13%
Moderate	13	7	20	2.5%
Severe	6	4	10	1.25%
Total	31	24	55	6.87%

Table (2) Prevalence according to gender

Gender	No.	%	Z-test	P-value
Boys	31	3.87	6.351	0.034
Girls	24	3.00		
Total	55	6.87		

- **P<0.05 Significant**

Table (3) Dental Erosion (Means and SD) according to facial and lingual/palatal surfaces

Score	Facial Surface Mean±SD	Lingual/palatal surface Mean±SD	t-test
Score 1	3.39±1.89	1.26±0.39	9.55 ^{**}
Score 2	1.93±0.46	0.40±0.45	3.45 [*]
Score 3	1.26±0.53	0.54±0.33	2.54 [*]

- *P<0.05 Significant **P<0.01 HS

Table (4) Dental erosion of upper and lower teeth according to surfaces (score 1)

Surface	Upper Mean±SD	Lower Mean±SD	t-test
Facial	2.97±1.01	0.42±0.89	12.345 ^{**}
Lingual	1.18±0.99	0.08±0.45	8.77 ^{**}
Occlusal	0.06±0.65	0.13±0.46	0.88
Total	3.98±1.09	0.56±0.77	19.657 ^{**}

- **P<0.01 HS

Table (5) Dental erosion of upper and lower teeth according to surfaces (score 2)

Surface	Upper Mean±SD	Lower Mean±SD	t-test
Facial	1.22±0.87	0.71±0.65	2.92[*]
Lingual	0.34±0.64	0.06±0.43	2.87[*]
Occlusal	0.43±0.69	0.25±0.65	1.23^{NS}
Total	1.96±0.98	0.96±0.62	2.88[*]

- ***P<0.05 Significant**

Table (6) Dental erosion of upper and lower teeth according to surfaces (score 3)

Surface	Upper Mean±SD	Lower Mean±SD	t-test
Facial	0.97±0.54	0.56±0.59	0.98
Lingual	0.47±0.82	0.07±0.67	1.67
Occlusal	0.49±0.97	0.63±0.33	0.54
Total	1.76±0.27	1.13±0.32	0.66

قياس مستوى انتشار تاكل الاسنان الحمضي لاطفال المدارس من عمر ١١-١٢ سنة في مدينة بغداد- الرصافة

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كلية طب الاسنان – الجامعة المستنصرية

اجريت هذه الدراسة لتعين مدى انتشار التاكل الحمضي لاطفال المدارس في جانب الرصافة و مقارنة العديد من الاسباب المتعلقة بتاكل الاسنان. اجريت الدراسة على (٨٠٠) طفل من عمر ١٢-١١ سنة في ثلاثة مدارس ابتدائية، (٣٨٠) من الذكور و (٤٢٠) من الاناث. تكونت مجموعة الدراسة من (٣١) ذكر و (٢٤) انثى من المصابين بتاكل الاسنان الحمضي.

تم قياس مستوى تاكل الاسنان باستخدام مؤشر تاكل الاسنان المعدل.

اظهرت نتائج الدراسة بان معدل انتشار تاكل الاسنان كان (٦.٨٧%) موزعة الى (٣.١٣%) تاكل ضعيف و (٢.٥%) تاكل متوسط و (١.٢٥%) تاكل شديد. اعلى معدل انتشار وجد عند الذكور (٣.٨٧%) عن الاناث (٣%) و بفارق معنوي. اظهرت النتائج وجود فروق معنوية في متوسط التاكل للسطوح الوجهية للاسنان مقارنة بالسطوح اللسانية و الحنكية لمجموعات التاكل الضعيف و المتوسط و الشديد على التوالي. كذلك وجدت فروق معنوية في متوسط التاكل للسطوح الوجهية العليا مقارنة بالسفلى و بين الاسطح الحنكية العلوية مقارنة بالاسطح اللسانية السفلية لمجموعتي التاكل الضعيف و المتوسط فقط.