

Prevalence of dental caries and associated teeth brushing behavior among Iraqi adolescents in Al-Door district

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Abstract

Dental caries is a highly prevalent chronic sugar-dependent infectious disease, affecting calcified tissue of the tooth and causing demineralization of the inorganic portion with subsequent destruction of the organic substance. The aim is to evaluate the prevalence and severity of dental caries among adolescents in association with teeth brushing habit. The study comprised 568 pupils of secondary schools, of both genders and aged between 13 and 17 years. Dental check-up was conducted by a single dentist using spot light, dental mirror and dental probe. Caries prevalence was analyzed using the DMFT index. DMFT index calculated according to WHO criteria for diagnosis and recording of dental caries. Data was analyzed using the Chi-square test and analysis of variance. A dental caries prevalence of 78.2% was recorded in the study population; females (84.6%) and males (71.6%). Mean DMFT for all population was 3.7. Older adolescent had higher DMFT ($p > 0.01$) than the younger ones. The prevalence of dental caries was high and not related to teeth brushing habits. These findings indicated that an increase of dental caries prevalence resulted from the inconsistency of knowledge concerning dental disease prevention and oral hygiene behavior. As a conclusion; increasing the prevalence of dental caries in Al-Door district highlights the need for a dental health program to target the specific segment of population.

Key words: dental caries, DMFT, brushing habits, adolescents.

Introduction

Dental caries is a highly prevalent chronic sugar-dependent infectious disease, affecting calcified tissue of the tooth and causing demineralization of the inorganic portion with subsequent destruction of the organic substance. The carious tooth never returns to its original state, even if it is treated.

Three factors play a role in the development of dental caries: firstly; the host (genetic predisposition, malnutrition during teeth formation and behavior, such as dietary habits and oral hygiene practices); secondly; the agent (mainly *Streptococcus mutans*); and finally the environment (lack of fluoride in water, lack of vitamin D and high consumption of refined sugars) [1, 2]. These factors interact to produce a variety of dental diseases at varying rate and intensities. Caries can be controlled by different measures but it can never be truly prevented [3]. Dental caries has a

worldwide distribution regard less of sex, age, race and socioeconomic level.

In many Arab countries, dental caries increasing over time, especially since the relatively recent economic growth, which has resulted in an increased consumption of refined sugar, higher than other developing countries [4]. Lack of awareness about oral health practices has also contributed to increase dental caries.

In Iraq, many studies were conducted to evaluate the decayed, missing and filled teeth (DMFT). The results showed that caries prevalence was high and it increased with age [5, 6]. These results are attributed to the irreversibility of caries process and accumulative nature of the disease on the one hand, and the paucity of planned preventive programmes in Iraq (including different methods of fluoride application on the other hand) [7].

Tooth brushing is associated with a significantly reduced risk of caries. The

more frequent brushing is performed, the less caries children experience [8].

The aims of the present study were to evaluate the prevalence and severity of dental caries in Al-Door district, and to estimate the oral health practices among adolescent pupils aged 13-17 years old.

Subjects and Methods

This cross sectional study was conducted between February and June 2008 in Al-Door district which is located on eastern side to Tigris River about 25 Km to the south from Tikrit (Salah Al deen governorate). The study population comprised 568 pupils in secondary schools which are established by gender into girls' and boys' schools. The individuals studied were 13-17 years-old of both sexes. All study participants were clinically examined by a researcher in school facilities using daylight, flat dental mirror and sharp dental probe. The adolescent came from medium socioeconomic background. We applied the diagnostic criteria of World Health Organization (WHO) [9], caries severity was presented through the DMFT index and its components: D (the number of decayed), M (the number of missing) and F (the number of filled) teeth. Radiographs were not taken in this study.

The pupils were divided according to their tooth brushing habits into three groups: the first group consisted of pupils who regularly brushed their teeth at night (alone or in addition to other time) take the code =1, this keeps the teeth clean from food debris during night hours, and in addition, salivary flow and oral movements decrease during sleep, which encourages the growth of plaques left on the teeth if brushing is not done, the second group irregularly brushed their teeth (in the morning only or at other times) take the code =2, the third group never brushed their teeth take the code

=3. Data analysis was under taken, first, to determine dental caries prevalence (represented by the percentage of adolescents who had one or more DMFT) and severity (represented by the mean DMFT), and secondly to investigate the association of tooth brushing behavior with caries prevalence and severity. After computing descriptive statistics, bivariate analysis used Chi-square tests for caries prevalence and analysis of variance (ANOVA) for caries severity. P-values of less than 0.05 were considered to be statistically significant.

Results

Of the 568 pupils examined, 286 (50.35%) were girls and 282(49.64%) were boys (table -1)

Table-1 shows, that female had higher prevalence rate of dental caries 242 (84.61%) than male 202 (71.63%). The difference between two group with respect to prevalence of dental caries was statistically highly significant ($p>0.01$).

The mean DMFT was 3.7 and the 95% confidence interval for population mean DMFT calculate is between 3.0-4.5. Mean DMFT index for female was 3.9 (S.D. ± 0.548) which was high but statistically non significant than the mean DMFT index for male 3.5 (S.D. ± 0.337) (Figure- 1).

Table-2 shows, that age 14 had lower prevalence rate of dental caries as compared to other ages, while age 15 had the highest rate. The differences was statistically non significant ($p<0.05$).

Figure 2: showed that older adolescent had higher mean of DMFT compared to younger ones. Adolescents aged 13, had mean DMFT 3.1 (S.D. ± 0.31) compared to 3.5(S.D. ± 0.34), 3.9(S.D. ± 0.41), 4.0 (S.D. ± 0.66) and 4.1 (S.D. ± 0.55) of those aged 14, 15, 16, and 17years in that order. The difference was statistically significant.

Table-3 shows, that 50.5% of study adolescent never brush their teeth,

and 38% brush their teeth irregularly and only 11.4% report to brush their teeth regularly. The prevalence rate of dental caries was greater among those brush their teeth irregularly (82.9%). The differences was statistically non significant ($p < 0.05$).

Figure.3 showed that mean DMFT was greater among pupils who brush their teeth irregularly 3.9(S.D. \pm 0.43) as compared to DMFT among those who brush their teeth regularly 3.8(S.D. \pm 0.27) and never brush their teeth 3.5(S.D. \pm 0.36). The difference was non significant statistically.

Table 4- Showed prevalence of caries-free was (21.8%), it was high in male (28.4%) than female(15.4%) ,it was greater at age 14 years old(26.1%), and it was high among those never brush their teeth(25.1%).

Discussion

Oral disease is a major public health problem due to the high prevalence in all regions of the world and the greatest impact on the socially marginalized populations. The caries prevalence was related to age, sex, dietary pattern including influence of sugar consumption and oral hygiene habits. The evaluation of caries risk is important. It gives an opportunity to improve hygiene, diet, and implement preventive measures in an exposed population. The overall prevalence rate of dental caries in this study was(78.2 %)which was similar to reported by Hamissi-J, et al in their study 780 high school students aged 15 and 16 years in Qazvin, Iran where the prevalence of dental caries was (75.5%)[10]. The prevalence of dental caries reported by Nibras AM, et al [11] among 12 year old school children from Baghdad, Iraq was (62.0%). Al-Sharabati-MM, et al [12] found that the prevalence of dental caries was (61.9) when they studied 389 boys

and 373 girls selected randomly from 11 public primary school in Benghazi, Libya.

Much lower rates were reported by Pontigo-L, et al (48.6%) among adolescent aged 12-15 in Hidalgo, Mexico [13]. Eugino D, et al [14] found the prevalence rate among children and adolescent aged 6-19 years was (42%) in United States. Further lower rates (21%, 18.3% and 30.1%) of dental caries was reported in three states of eastern region of India among age 15-16 years [15]. In Riyadh, Saudi Arabia a study was carried out to determine the caries prevalence and severity in school children, and to assess the oral health knowledge, attitude and practices of their teacher. The prevalence rate was reported to be as high as (94.4%), and the teacher knowledge regarding oral health was satisfactory and their attitude towards oral health was very positive [16].

In this study it was found that the prevalence of dental caries among girls was significantly higher than boys a result which similar with that found in United States[14] and Lagos Nigeria[17] and Gwalior, India [18] and Tenerife, Canary Islands[19] were no statistical significant differences were found in dental caries between females and males. This higher prevalence is often explained by one of three factors; firstly, earlier eruption of teeth in girls, hence longer exposure of girls teeth to the cariogenic oral environment; secondly, easier to food supplies by women and frequent snacking during food preparation; thirdly, pregnancy.

According to present study the mean DMFT was moderate 3.7. These results coincide with other Arab countries such as Saudi Arabia where the DMFT among children aged 13-15 and 16-18 was 3.46 and 4.31 respectively[20]. Also in agreement with the results obtained from Kuwait where

the mean DMFT among children aged 9-18 years was 3.25 [21].

Older adolescents have higher DMFT than younger ones. These findings are in accordance with the observation of Gasgoos and Khamrco in Mosul Iraq [22] and Umesi et al [17] in Lagos Nigeria. It might be suggested that, the development of dental caries is a long term process, and the habit of sugar consumption is relatively high among adolescents (in the form of chocolates and other stick sugar rich food), but the people usually don't attend hospitals until and unless they feel unbearable pain in the mouth. So we have found that mean DMFT values increase with age.

The results showed that 50.5% were never brush their teeth which is similar to what found by Gasgoos and Khamrco [22] that found 51.4% of adolescent aged 10-19 not brush their teeth, this figure is lower than that in Jordan (64.4%) of non or irregularly teeth brusher among students 14-15 years old [23], but higher than that in Syrian Arab republic 29% for infrequent tooth brushing [24]. This indicates the poor awareness among them regarding oral health. Many researchers have reported that the prevalence of regular tooth brushing has a positive impact on dental caries [25, 26, 27 and 28]. No such effect was observed in this study that showed the prevalence of dental caries was not related to brushing habits and this in accordance to what found by Shuji M [29] among Chinese adolescents in Taiwan and Namal et al [30] in Turkish preschool children. This is due to failure to perform tooth- brushing effectively and correctly.

As a conclusion; the prevalence of dental caries was estimated in 568, 13-17- year-old adolescents in Al-Door district. Following conclusions were drawn from this study.

1. The prevalence of dental caries and DMFT were higher in girls than boys.

2. Mean DMFT was increased with increasing age.

3. Caries prevalence did not have any statistically significant relation with brushing habit.

Increasing the prevalence of dental caries in Al-Door district highlights the need for a dental health programme to target the specific segment of population through systematic public and school health education programmes. Parents could also be benefit from oral health education and should be advised to maintain good oral hygiene.

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Table (1): Prevalence of dental caries according to gender (%).

Gender	No. examined (%)	Prevalence (%)
Females	286 (50.4 %)	242 (84.6%)
Males	282 (49.6 %)	202 (71.6%)
Total	568 (100%)	444 (78.2%)

X²:14.028

df: 3

p: >0.0

Table (2): Prevalence of dental caries according to age (%).

Age	No. participants (%)	Prevalence (%)
13	103 (18.1%)	80 (77.7%)
14	134 (23.6%)	99 (73.9%)
15	121(21.3%)	100 (82.6%)
16	105(18.5%)	81 (77.1%)
17	105(18.5%)	84 (80.0%)
Total	568 (100%)	444 (78.2%)

X²:3.150

df: 9

p: <0.05

Table (3): Prevalence of dental caries according to tooth brushing behavior (%).

Brushing behavior	No. in the sample (%)	Prevalence (%)
Regular	65 (11.4%)	50 (76.9%)
Irregular	216 (38.0%)	179 (82.9%)
Never	287(50.5%)	215 (74.9%)
Total	568	444 (78.2%)

X²:4.640

df: 5

p: <0.05

Table (4): Prevalence of Caries- Free according to gender, age, and tooth brushing habit

Variables		No. examined	Caries-free (%)
(gender)	Female	286	44 (15.4%)
	Male	282	80 (28.4%)
(Age)	13 y	103	23 (22.3%)
	14 y	134	35 (26.1%)
	15 y	121	21 (17.4%)
	16 y	105	24 (22.9%)
	17 y	105	21 (20.0%)
(Brushing habit)	Regular	65	15 (23.1%)
	Irregular	216	37 (17.1%)
	Never	287	72 (25.1%)
Total		568	124 (21.8%)

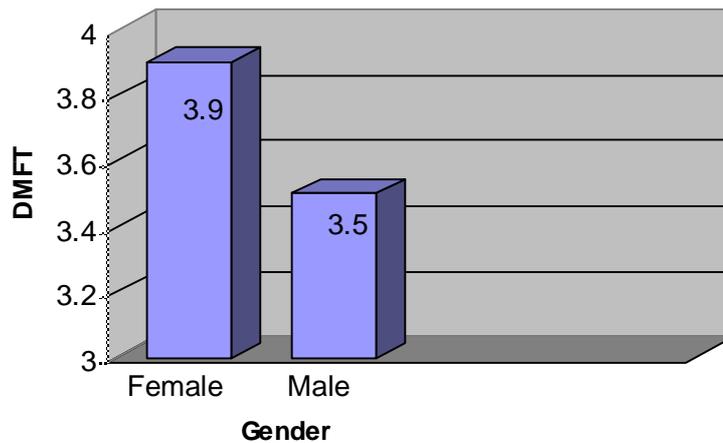


Figure (1): DMFT according to gender

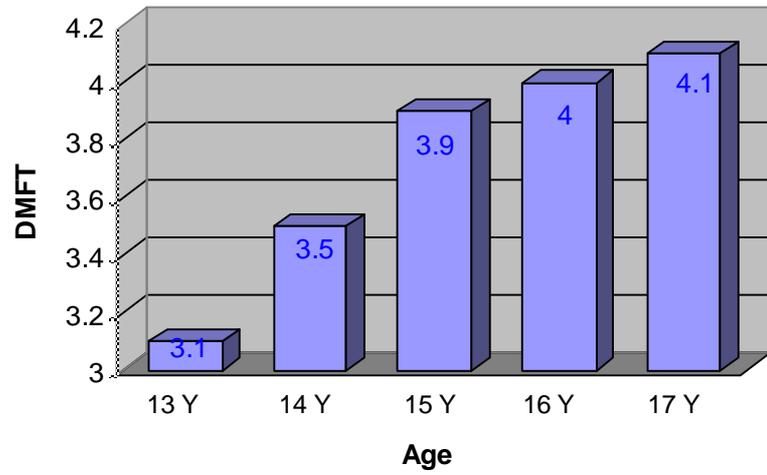


Figure (2): DMFT according to age

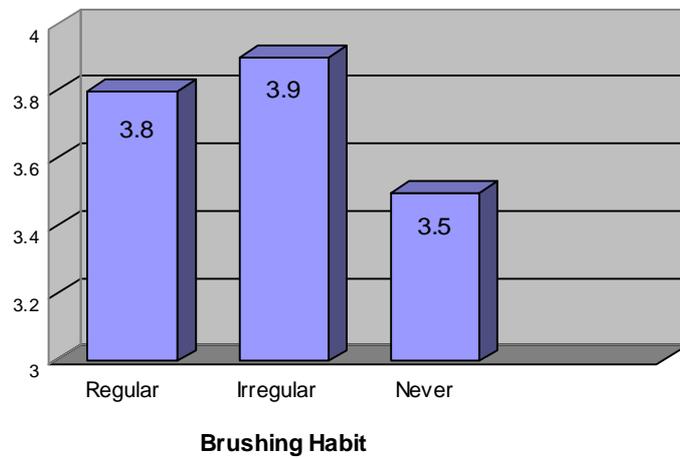


Figure (3): DMFT according to brushing habit