

Prevalence of dental caries among primary school children in Thamar Governorate in Republic of Yemen

Faraed D Salman
BDS, MSc (Lect)

Department of Pedod, Orthod and Prev Dent
College of Dentistry, University of Mosul

ABSTRACT

The aim of the study was to determine the prevalence of dental caries among primary school children in Thamar Governorate, Republic of Yemen. A random sample of 494 primary school children was examined. The sample was divided into 3 age groups; namely, 6, 9, and 12 years old.

The WHO methodology (1997) was used to assess the individual tooth status. Results of dental caries in the primary den-tition showed that the mean dmft for the total sample was 3.40 ± 0.15 which was decreased with increasing age from 3.59 to 3.57 to 2.19 for the age groups 6, 9 and 12 years respectively with significant sex dif-ference (males was higher than females) as total, 3.93 for the total males, 2.84 for the total females.

For the permanent dentition, the mean DMFT was 3.35 ± 0.12 which was increased with increasing age with statistically significant age difference as it was 2.39, 2.98, 3.85 for the age groups 6, 9 and 12 years respectively with no sex variation.

Key Words: Dental caries, tooth status, primary school children.

الخلاصة

إن الهدف من الدراسة هو التعرف على انتشار ظاهرة تسوس الأسنان في المدارس الابتدائية في محافظة ذمار في جمهورية اليمن. لقد تم فحص عينة عشوائية مكونة من ٤٩٤ تلميذ من تلاميذ المدارس الابتدائية وتم تقسيم العينة إلى ثلاث فئات عمرية ٦ و ٩ و ١٢ سنة.

استخدمت توصيات منظمة الصحة العالمية لسنة ١٩٩٧ لبيان حالة الأسنان اللبينية باحتساب مؤشر (dmft) لمجموع العينة إذ كان 3.40 ± 0.15 وكان يقل بازدياد العمر من ٣.٥٩ إلى ٣.٥٧ إلى ٢.١٩ للأعمار ٦ و ٩ و ١٢ سنة على التوالي مع وجود فرق إحصائي معنوي للجنسين بالنسبة لانتشار التسوس حيث أن معدل الذكور أعلى من الإناث حيث كان لمجموع الذكور ٣.٩٣ و ٢.٨٤ لمجموع الإناث.

أما بالنسبة للأسنان الدائمة، فإن معدل مؤشر (DMFT) لمجموع العينة كان 3.35 ± 0.12 الذي كان يزداد بزيادة العمر بفرق معنوي إحصائي حيث كان ٢.٣٩ و ٢.٩٨ و ٣.٨٥ للأعمار ٦ و ٩ و ١٢ سنة على التوالي وبدون فروقات معنوية بالنسبة للجنس.

INTRODUCTION

Dental caries is in essence a life style disease which at the tooth level manifests itself as an imbalance between main calcium and phosphate in the enamel and in saliva, mediated by plaque micro-organisms but influenced by fluoride and other factors.⁽¹⁾

There is a particular need for reports

of dental disease in developing countries where it is specially desirable to measure disease level over periods of time when dietary and social conditions are likely to change.⁽²⁾ Dental caries is a major problem in dentistry and should receive significant attention from restorative and preventive stand point.⁽³⁾

In developing countries there is a

sharp increase in caries experience^(2, 4) while it has undergone a striking reduction in most developed countries over a relatively short period mainly due to the wide spread of fluorides and a change in the dietary habits,⁽⁵⁻⁷⁾ while in fact dental caries has raised in many developing countries at an alarming rate.⁽⁸⁾ School oral health services focusing on prevention and oral health care services must be targeted to the appropriate oral health needs of school age population.⁽⁹⁾ Top priority is given to a preventive dental care programme for 0–16 years old children, starting with the youngest age groups, as the youngest age groups require the most extensive care⁽¹⁰⁾ specially this is the first study conducted in Republic of Yemen regarding caries experience.

The aims of the study are to determine the prevalence of dental caries in primary school children in Thamar age 6–12 years, to determine age and sex differences in the prevalence of dental caries and to obtain data that can help in planning preventive dental health programs for school children in Republic of Yemen.

MATERIALS AND METHODS

The sample composed of 494 primary school children aged 6, 9, 12 years old randomly selected from eight primary schools in Thamar Governorate in Republic of Yemen (total males 254, total females 240) divided into 3 age groups: 6, 9, 12 years.

Oral Examination

Examination of teeth was performed according to the basic method of oral health survey of WHO for the year 1997 assessing tooth status, dmft and DMFT indices were used.⁽¹¹⁾

The examination was carried out using plane mouth mirrors and sharp sickle shaped dental caries explorers. The examination was performed in classrooms, children chosen randomly from the list were examined under natural daylight. All the teeth present in the mouth were examined in a systematic approach starting from the last upper right molar and proceeding in an orderly manner from one tooth or tooth space to the adjacent tooth or tooth space till the last lower right molar.

Information regarding name, age, sex of the child was registered on a special case sheet prior to examination.

Means were tested for their significant difference at 0.05 level using Duncan's Multiple Range Test.

RESULTS

Table (1) shows the distribution of the sample by age and sex. The sample composed of 494 children, 254 males (51.5%), 240 females (48.5%) divided into 3 age groups: 6, 9, 12 years old. Age 6 constitutes 31.6% of the total sample; age 9 constitutes 34.4% of the total sample; and age 12 constitutes 34.0%; the total forms 100%.

Table (1): Distribution of the sample by age and sex

Age (Years)	Male		Female		Total	
	No.	%	No.	%	No.	%
6	80	31.4	76	31.6	156	31.6
9	87	34.3	83	34.6	170	34.4
12	87	34.3	81	33.8	168	34.0
Total	254	100	240	100	494	100

Table (2) shows the mean dmft for the total sample. Significant difference was found between total males and total females 3.93, 2.84 respectively. No significant difference was found between age 6 and 9 years old but significant difference

was found between 9 and 12 years old and between 6 and 12 years old respectively.

Table (3) shows the mean DMFT for the total sample. No significant difference was found between total males and total females. Significant difference was found

between age 9 and 12 years old as it was 2.98, 3.85 respectively, and significant

difference between age 6 and 12 years old as it was 2.39, 3.85 respectively.

Table (2): Mean dmft and its components \pm SE by age and sex

Age	Sex	dmft	dt	mt	ft
		Mean \pm SE			
6	Male	4.23 \pm 0.35 ^a	4.09 \pm 0.33 ^a	1.42 \pm 0.29 ^a	0.50 \pm 0.00 ^a
	Female	2.94 \pm 0.23 ^{abc}	2.97 \pm 0.23 ^{abc}	1.00 \pm 0.00 ^a	1.00 \pm 1.00 ^a
	Total	3.59 \pm 0.21 ^A	3.54 \pm 0.21 ^A	1.25 \pm 0.18 ^A	0.80 \pm 0.20 ^B
9	Male	4.02 \pm 0.36 ^{ab}	3.77 \pm 0.31 ^{ab}	1.75 \pm 0.37 ^a	1.00 \pm 1.00 ^a
	Female	2.81 \pm 0.35 ^{bc}	2.8 \pm 0.35 ^{abc}	1.00 \pm 0.00 ^a	–
	Total	3.57 \pm 0.27 ^A	3.43 \pm 0.24 ^A	1.60 \pm 0.31 ^A	1.00 \pm 0.00 ^A
12	Male	1.64 \pm 0.36 ^c	1.67 \pm 0.44 ^c	1.56 \pm 0.50 ^a	–
	Female	2.5 \pm 0.40 ^c	2.47 \pm 0.42 ^{bc}	–	–
	Total	2.19 \pm 0.30 ^B	2.21 \pm 0.32 ^B	1.50 \pm 0.5 ^A	–
Total Male		3.93 \pm 0.24 ^(a)	3.79 \pm 0.22 ^(a)	1.55 \pm 0.21 ^(a)	0.80 \pm 0.20 ^(a)
Total Female		2.84 \pm 0.17 ^(b)	2.85 \pm 0.17 ^(b)	1.00 \pm 0.00 ^(a)	1.50 \pm 0.50 ^(a)
Total Sample		3.3 \pm 0.15	3.3 \pm 0.14	1.3 \pm 0.14	1.11 \pm 0.26

Means with the same letters are statistically not different ($p \geq 0.05$).

SE: Standard error.

Table (3): Mean DMFT and its components \pm SE by age and sex

Age	Sex	DMFT	DT	MT	FT
		Mean \pm SE			
6	Male	2.73 \pm 0.36 ^{bc}	2.38 \pm 0.33 ^{bc}	–	1.67 \pm 0.94 ^{ab}
	Female	1.86 \pm 0.35 ^c	1.86 \pm 0.35 ^c	–	1.00
	Total	2.39 \pm 0.26 ^B	2.17 \pm 0.24 ^C	–	1.57 \pm 0.43 ^{AB}
9	Male	2.91 \pm 0.20 ^{bc}	2.87 \pm 0.20 ^{bc}	–	1.00 \pm 0.0 ^b
	Female	3.05 \pm 0.24 ^b	3.00 \pm 0.25 ^b	1.00	1.25 \pm 0.25 ^b
	Total	2.98 \pm 0.16 ^B	2.94 \pm 0.16 ^B	1.00	1.14 \pm 0.14 ^B
12	Male	4.27 \pm 0.32 ^{ab}	4.23 \pm 0.32 ^a	2.00 \pm 1.41	1.50 \pm 0.50 ^b
	Female	3.38 \pm 0.23 ^a	3.47 \pm 0.24 ^{ab}	1.00 \pm 0.0	3.00 \pm 0.00 ^a
	Total	3.85 \pm 0.20 ^A	3.89 \pm 0.21 ^A	1.18 \pm 0.60	2.40 \pm 0.40 ^A
Total Male		3.59 \pm 0.19 ^(a)	3.51 \pm 0.20 ^(a)	2.00 \pm 1.00 ^(a)	1.46 \pm 0.28 ^(a)
Total Female		3.10 \pm 0.16 ^(a)	3.11 \pm 0.16 ^(a)	1.00 \pm 0.00 ^(b)	1.88 \pm 0.35 ^(a)
Total Sample		3.35 \pm 0.12	3.3 \pm 0.12	1.16 \pm 0.16	1.63 \pm 0.21

Means with the same letters are statistically not different ($p \geq 0.05$).

SE: Standard error.

DISCUSSION

The present study shows that the mean dmft appears to be decreasing with increasing age as the primary teeth exfoliate at older ages. Differences between either two ages were statistically significant while with the other is not significant. This result is in agreement with many studies conducted in the developed and developing countries.⁽¹²⁻¹⁴⁾

Males show higher dmft than females

with statistical significant difference. This result is in accordance with other studies.^(12, 14) The results of this study have shown that the ratios of the dmft components to the dmft were: dt/ dmft = 98.16%, mt/ dmft = 0.30%, ft/ dmft = 0.060%. This indicates a very high proportion of a decayed primary teeth and a very low proportion of filled teeth. This may reflect an unawareness of the importance of the primary teeth or negative

attitude of the parents toward dental treatment and in turn lack of cooperation of the children.

Concerning the DMFT for the permanent dentition, results of this study have shown that the mean DMFT for the total sample was 3.35 (2.39 at the age of 6 years, 2.98 at the age of 9 years and 3.85 at the age of 12 years).

The caries prevalence and severity among permanent dentition is increasing with advancing age. No significant difference was found between 6 and 9 years old but significant difference was found between the ages 9 and 12 years old. This is attributed to the irreversibility of the caries process and accumulative nature of the disease. This finding is in agreement with many studies in the developed countries^(8,12, 15-17) and in developing countries.^(14, 18-20)

The results revealed no statistical significant difference was found between males and females. This is in accordance with studies conducted in the developed and developing countries.^(14, 21) The result of the mean DMFT at 12 years old was 3.85, according to WHO DMFT range at 12 years of 1995.⁽²²⁾ This DMFT is considered a moderate level, which is similar to many developed countries like Austria, Canada, Italy, Japan and Russian Federation, and some developing countries like India and Madagascar.⁽²²⁾ The result is higher than most of the Arab countries level except Lebanon which is the highest (DMFT= 5).⁽²²⁾

Among the studies carried out in Iraq, the result of this study is in agreement with that of Khamrco and Al-Salman⁽²³⁾ in Mosul center which revealed the mean DMFT for 10-14 years old was 3.75, but this mean is higher than that reported by Salman⁽²⁴⁾ among primary school children in Mosul City center which revealed the mean DMFT for 6-12 years was 2.84. This difference in the mean DMFT of the two studies in Mosul may be due to differences in the intercalibration examination of the diagnostic criteria of dental caries that could account for DMFT variation records,⁽¹⁸⁾ and may be due to differences in the sample size of the two studies. In the first study it was 641 school children and the second one was 1440 sch-

ool children. Also the difference may be attributed to the variation in the age range between the two studies.

Results of this study have shown that the ratios of the components to the DMFT were as follows: DT/ DMFT = 98.5%, MT/ DMFT = 0.35%, FT/ DMFT = 0.48%. The highest proportion was for the decayed teeth. This may indicate that therapeutic dental services are limited due to inadequacy and lack of awareness.

Since therapeutic measures are expensive and resources are restricted because Republic of Yemen is a primitive country so great emphasis should be directed toward primary prevention of the disease and dental health education of the population about the decrease of sugar consumption and control the availability of sugar containing products, confections, drinks, also reducing the frequency of sugar consumption between meals in order to reduce caries activity.⁽²⁵⁾ It is noted that the need for services is far greater than the demand in selected developing countries of Eastern Mediterranean region, since the percentage of the population seeking treatment on demand varied between 25% (the highest) in Libyan Arab Jamahirriya and 2% (the lowest) in Sudan. The percentage of population receiving dental care in Republic of Yemen is 2-3% according to WHO reports of 1996 which is regarded very low.⁽²⁶⁾ The main concern of the existing services is to satisfy the current curative demands. This does not comply with the philosophy of a preventive approach. Because of lack of materials and instruments and non-functioning equipment, such services are of ambulatory nature (concerning on tooth extraction) with negligible restorative care. Prerequisite to such a strategy is the continuous development of an active oral health human resources relevant to country needs and resources.⁽²⁶⁾

CONCLUSIONS

The mean dmft for the total sample was 3.40 ± 0.15 which was decreased with increasing age.

There was significant sex difference concerning caries experience in primary dentition (males were higher than females); as total, 3.93 for the total males and

2.84 for the total females.

The mean DMFT for the total sample was 3.35 ± 0.12 which was increased with increasing age with statistically significant difference and no sex variation.

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