Distribution of Dental Caries among Primary School Children in Al-Mukalla Area – Yemen

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Abstract:

This cross-sectional study is carried out to identify the distribution of dental caries among 400 primary school children of 12 years age in Al-Mukalla area in Yemen.
It was found that 198 (49.5%) out of 400 school children have dental caries; of those affected children 51.5% were males, and 48.5% were females. Dental caries was found to occur more in permanent teeth (76.6%) and distributed mostly in the lower jaw (54%). It is more distributed in urban areas where the affected seen to represent 53%, whereas in the rural areas it was 38%. In comparison, the distribution of dental caries (among the affected) in private schools (57%) is more than that in governmental schools (47%), and the children living in areas receive their water supply from Al-Ghail, Source 1, are affected (53.6%) more than those living in areas supplied from Al-Taweela, Source 2, (42.7%). Finally dental caries causes missing of the teeth in 8% of children.

Key words: Dental caries, children, Hadhramout, Yemen.

Introduction:

One of the most prevalent health problems in the world (developed, and developing countries) is dental caries [(1)]. This disease affects most of the community members but it is more prevalent in children.
Dental caries is defined as gradual irreversible decay of teeth resulting from a series of biochemical events occurring at a localized site of the tooth, these biochemical events are formed by interaction between the bacteria and the food particles specially refined carbohydrate (sugar) on tooth, if this decay is allowed to progress the surrounding tissue, will become inflamed and an abscess will be formed, which might become as a nidus for infection of other sites of body [(2)].
However, Tickle *et al*. [(3)] attributed the dental caries to socio-economic status, while Abdolfotouh *et al*. [(4)] reported that animal studies have shown that early malnutrition affects tooth structure, delays tooth eruption and results in increased dental caries. In human, however, there has been much controversy regarding the negative association between nutritional status and the prevalence of caries [(5,6)].
The aim of this study is to determine the distribution of dental caries among primary school children in Al-Mukalla area in Yemen and to attribute such distribution to local water supply sources.

Subjects and Methods:

A cross-sectional, descriptive study was conducted in seven primary schools in Al-Mukalla area during December 2000.
The studied sample was chosen for the application of the descriptive study by multistage stratified sampling with sample size of 400 children (200 males, and 200 females). All children were selected from the 4th class of primary school children, because most of them are around 12 years of age. This selection was chosen due to the presence of the two types of teeth (deciduous and permanent) and the caries mostly occurs at this stage [(7-12)].
The students were selected from two private schools and five governmental schools, 50 children were chosen from each school.
Each child, from the sample, was exposed to medical physical examination of the mouth and examination sheet was prepared for results recording. The examination sheet consists of items concerning with the personal information of the pupils (age, sex, address, and others), and part for physical examination results were used.

Clinical examinations were carried out under standardized conditions by a trained and examiner.

Results:

Dental caries was found to represent a high percentage of distribution among the studied sample. Of 400 children encountered in this study, 198 were seen affected and this represents half of the sample, 49.5% (table 1). Males were noticed slightly more affected (table 2) than females, 51.5% and 48.5% respectively. The distribution of dental caries was higher in permanent teeth (76.6%) than deciduous teeth (23.4%) as shown in table 3.

It is evident, from table 4, that the physiological teeth eruption is the major cause of teeth missing and represents 76% compared to other minor causes like trauma (16%) or caries (8%).

The lower jaw was seen more affected (54%) by the caries than the upper jaw (table 5) and the dental caries is more prevalent, as illustrated in table 6, in urban (53%) than rural (38%) areas. Moreover, the percentage of dental caries was noted to be higher among private school children (57%) than those of the governmental schools (47%) as obtained from table 7.

According to the source of water supply, dental caries was prevalent in children belong to Al-Mukalla, Al-Shareg, Al-Dees, and other surrounding areas, which receive their water supply from Al-Ghail (Source 1) than those belong to Fowa, Ibn Sina, and surrounding areas, which receive their water supply from Al-Taweela (Source 2). Such prevalence is tabulated in table 8 and found to represent 53.6% compared to 42.7%.

Discussion:

This study shows that the percentage of dental caries among school children in Al-Mukalla falls into the category of high caries level, and it is similar to results reported in most developed and developing countries [4,7,8]. The ratio of dental caries in this study was seen to be less than that reported in Japan [9] (only 49.5% compared to 77%), but approximate to that reported in France [10], which represents 50%.

According to WHO/FDI global goals for oral health, by the year of 2000 [11], 50% of children between five and six years should be free of dental caries, and no more than three decayed, missing or filled teeth at the age of 12 years should be present. The present study aims to reflect the goal with respect to the status of the permanent dentition among the age group studied. However, the measurement of socio-economic status of the students is very important in case of performing the prevalence of dental caries.

Tewari [12] studied the prevalence of dental caries in 509 primary school children among the age group of 3-7 years. In comparison with other age groups he concluded that the prevalence was significantly higher at the age of 12 years. In addition, he reported that the difference between males and females was statistically significant. These results are confronted with our findings of the prevalence at the selected age group, but differ in relation to male/female ratio where the prevalence is only slightly higher in males (51.5%) than females (48.5%).

Regarding the dental caries according to type of affected teeth, our study shows that 76.6% of permanent teeth were affected. However, Abolfotouh *et al*. [4] concluded that nutritional status might have different effects on susceptibility to caries of deciduous and permanent teeth.

Al-Malik *et al*. [13] showed that there was no clear relationship between erosion and social class, or between erosion and oral hygiene practice while the reverse was true for caries, the dietary factors, on the other hand, were related to both erosion and caries. In this study, it was found that the frequency of physiological eruption represents 76% of teeth missing, while caries represents only 8%. This might be due to possible association between dental caries and variables including socio-economic status, dietary practices, and oral hygiene behavior [14,15,16]. However, further study is needed to investigate the relation between erosion and dental caries in our country.

The distribution of dental caries according to the school type, our results showed that the high frequency of affected teeth was seen among private school children. However, Tickle *et al*. [3] explained that the dental caries was seen among school children could be attributed to the home environment rather than that of the school (Governmental or private).

The relative high incidence of dental caries among the teeth of the lower jaw could be

attributed to the early eruption of such teeth than those of the upper jaw [17] or could be again related to multiple factors that include early eruption, socio-economic status, oral hygiene and others.

Regarding the sources of water supply and its relation to dental caries, it was found that the reduction in dental caries during the last years is attributable to the introduction of salt fluoridation with water [18]. Also the use of fluoride toothpaste and dietary fluoride supplements as well as access to dental health promotion and preventive as well as curative services seem to be the major contributions to the reduction of dental caries. However Lulic-Dukie *et al*. [14] revealed in their study the importance of early introduction of teeth brushing and giving up the nightly consumption of sweet beverages in prevention of early child caries.

Finally, it can be concluded that the risk of dental caries appears to be associated with the preschool time frame and, therefore, the dental service should redirect its attention to preschool children with preventive policy through dental health education.

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Table 1: Distribution of dental caries among the studied samples

Case	Frequency	Percentage
Affected	198	49.5%
Not affected	202	50.5%
Total	**400**	**100%**

Table 2: Distribution of dental caries among affected children according to sex

Sex	Frequency	Percentage
Male	102	51.5%
Females	96	48.5%
Total	**198**	**100%**

Table 3: Distribution of dental caries according to type of affected teeth

Type of affected teeth	Frequency	Percentage
Deciduous	119	23.4%
Permanent	390	76.6%
Total	**509**	**100%**

Table 4: Causes of teeth missing

Cause	Frequency	Percentage
Physiological eruption	105	76%
Trauma	22	16%
Caries	11	8%
Total	**138**	**100%**

Table 5: Location of dental caries regarding to the jaw

Type of jaw	Frequency	Percentage
Upper jaw	234	46%
Lower jaw	275	54%
Total	**509**	**100%**

Table 6: Distribution of dental caries according to residency

Residence area	Affected		Non affected		Total	
	No.	%	No.	%	No.	%
Urban	160	53	140	47	300	100
Rural	38	38	62	62	100	100

Table 7: Distribution of dental caries according to school type

School type	Affected		Non affected		Total	
	No.	%	No.	%	No.	%
Governmental	141	47	159	53	300	100
Private	57	57	43	43	100	100

Table 8: Distribution of dental caries according to source of water supply

Type of water supply	Affected		Non affected		Total	
	No.	%	No.	%	No.	%
Source (1)	134	53.6	116	46.4	250	100
Source (2)	64	42.7	86	57.3	150	100