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

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Abstract:
Statement of problem: Dental caries are considered as one of the most common health problems and have been shown to be more prevalent in children.
Purpose: The aim of this cross-sectional study was to determine the distribution of dental caries among 400 twelve-year-old schoolchildren, in the Al-Mukalla area in Yemen.
Materials and Methods: Multistage stratified sampling was used to obtain a sample size of 400 children, consisting of 200 males and 200 females with mixed dentitions. All subjects were selected from two private schools and five public schools. Clinical examinations were performed under standardized conditions by a trained examiner.
Results: Dental caries was found in 198 (49.5%) of the 400 schoolchildren including 51.5% males and 48.5% females. The prevalence of caries was higher (p<0.05) in permanent teeth (76.6%), in urban areas and in the mandible (54%); compared to deciduous teeth, rural regions and the maxilla, respectively. Private schools (57%) revealed a larger number of affected cases as compared to public schools. Dental caries were more prevalent in children living in areas that received their water supply from Al-Ghail, in comparison to those residing in regions supplied from Al-Taweela water source (p<0.05). Caries were the primary cause of missing teeth in 8% of the subjects.
Conclusion: Considering that dental caries can be associated with children’s school grade, dental services should be directed toward preschool children with a preventive policy through dental health education.

Key Words: Dental caries; Children; Hadhramout; Yemen

INTRODUCTION
Dental caries are one of the most prevalent health problems in developed and underdeveloped countries [1]. This disease affects a wide age range but is more common in children.
Caries are defined as gradual irreversible decay of teeth resulting from a series of biochemical events occurring at a localized tooth site. These events develop by the interaction between bacteria and food particles, especially refined carbohydrates (sugar). Progression of decays to the surrounding tissue can cause inflammation and abscess formation which may subsequently act as a nidus for infection of other organs [2].
Tickle et al [3] attributed the formation of dental caries to the patients’ socio-economic status, while Abdolfotoh et al [4] reported that early malnutrition can affect tooth
structure, delay tooth eruption and result in increased dental caries in animals. In humans, 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 was to determine the distribution of dental caries among primary schoolchildren in Al-Mukalla area in Yemen and to associate this distribution to local water supply sources.

MATERIALS AND METHODS
A cross-sectional, descriptive study was conducted in seven primary schools in Al-Mukalla area during December 2000. Multi-stage stratified sampling was used to obtain a sample size of 400 children consisting of 200 males, and 200 females. Fourth-graders were chosen because most of them are approximately 12 years old and in the mixed dentition stage. Previous studies have reported a higher prevalence of tooth decay during this period [7-12].

The students were selected from two private schools and five public schools. The nature and purpose of the study was explained to the parents and written consents were obtained. Demographic information and data obtained from physical examination were recorded. All clinical examinations were carried out under standardized conditions by a trained examiner and WHO criteria used as scoring system. Statistical analysis was carried out using frequency and percentages for univariate analysis and chi square test for bivariate analysis with alpha level of 0.05.

RESULTS
Dental caries revealed a wide distribution among the study sample and were encountered in 198 of the 400 children which was equivalent to almost half (49.5%) the cases. Males were affected more than females, with 51.5% and 48.5% occurring in boys and girls, respectively. The prevalence of dental caries was higher in permanent teeth (76.6%) as compared to deciduous teeth (23.4%).

Missing teeth were most frequently associated with agenesis (76%), however trauma and caries were the cause in 16% and 8% of the cases, respectively.

The mandible had a larger amount of caries (54%) than the maxilla. Moreover, the percentage of dental caries was significantly higher among children residing in urban regions in comparison to those of rural areas.

The number of dental caries was greater in children living in Al-Mukalla, Al-Shareg, Al-Dees, and other neighboring areas, that received their water supply from Al-Ghail (Source 1) compared to those residing in Fowa, Ibn Sina, and adjacent districts, supplied by the Al-Taweela (Source 2) water source (P<0.05). The distribution of dental caries according to different factors is shown in Table I.

DISCUSSION:
In the present study, schoolchildren living in Al-Mukalla demonstrated a high caries level which is similar to the results reported in most developed and underdeveloped countries [4, 7,8]. The amount of dental caries in the current investigation was found to be less than that

<table>
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<th>Table I: Distribution of dental caries according to residency, school type, and source of water supply.</th>
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<tr>
<td><strong>Resident area</strong></td>
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<tr>
<td>Urban</td>
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<tr>
<td>Number of carries (%)</td>
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<td>Number of non-carries (%)</td>
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<td>P-value</td>
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Values in parentheses are percentage.
reported in Japan (49.5% compared to 77%), but comparable to French children (50%) [9,10].

According to the global goals for oral health published by WHO/FDI [11], 50% of children between five and six years of age should be free of dental caries by the year 2000, and should have no more than three decayed, missing or filled teeth at the age of 12 years. The aim of this study was to determine the distribution of dental caries among primary school-children in Al-Mukalla area in Yemen. The socio-economic status of children may affect the prevalence of dental caries, but unfortunately we were unable to assess this factor in our study samples.

Tewari [12] studied the prevalence of dental caries in 509 primary school children between 3 and 7 years of age and concluded that it was significantly higher in 12 year-old children. In addition, he reported that the difference between males and females was statistically significant. We also found a similar prevalence for the same age group but were unable to demonstrate a significant difference between male and female subjects.

In the current investigation, a higher prevalence of dental caries was found in permanent (76.6%) as compared to deciduous teeth. Abolfotouh et al [4] showed that nutritional status might have different effects on deciduous and permanent teeth regarding their susceptibility to caries. The nutritional status of the subjects was not evaluated in the present study; however, it might be responsible for the difference observed between the two dentitions.

Al-Malik et al [13] reported that there was no clear relationship between dental erosion and social class or between dental erosion and oral hygiene practice, while the reverse was true for caries. Dietary factors, on the other hand, were related to both erosion and caries. In the current study, 76% of the missing teeth were congenital, whereas caries were responsible for only 8% of the cases. This might be due to the possible association between dental caries and variables such as socio-economic status, dietary practices, and oral hygiene behaviors [14-16]. However, further investigation is required to determine the relation between erosion and dental caries in Yemen.

In the present study, a higher rate of caries was found among children attending private schools as compared to public schools. However, Tickle et al [3] showed that the distribution of dental caries in schoolchildren could be attributed to home environment rather than that of the school.

The high incidence of dental caries in the lower jaw could be related to the early eruption of mandibular teeth in comparison to maxillary teeth [17]. In addition other factors such as socio-economic status, oral hygiene, etc, could also be considered as a possible cause for this difference.

A decrease in the incidence of caries has been shown during the last few years which could be attributed to fluoridation of drinking water [18]. Also the use of fluoride toothpaste and dietary fluoride supplements as well as access to dental health programs and preventive as well as curative services seem to be major contributors to the reduction of dental caries. Lulic-Dukie et al [14] emphasized the importance of early introduction of tooth brushing and excluding the nightly consumption of sweet beverages in the prevention of early childhood caries.

CONCLUSION
Dental caries is an important health problem in school children especially in urban areas of Mukalla, Yemen. Promotion of school dental health services is recommended with emphasis on dental health education.

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REFERENCES