

Original Research Article

Prevalence of Dental Caries among 5-12 Year Old School Going Children in Urban and Rural Areas of Mahabubnagar District, Telangana, India

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Abstract: Dental caries is a multifactorial disease. The prevalence and incidence of it in a population is influenced by various risk factors such as age, sex, socioeconomic status, sugar exposures and oral hygiene habits. Hence, the present study was designed to assess the prevalence of dental caries in school going children in urban and rural areas of Mahabubnagar district between 5 to 12 year age groups. Material & Methods: A total of 1000 children aged 5-12 years were selected from 8 schools located in different geographic areas of Mahabubnagar. Children were divided into two age groups, Group I – 5-8 years, Group II – 9-12 years. A trained dental surgeon using DMFT/deft index to diagnose dental caries performed the clinical examinations. Results: Among the two groups, Group I, showed high mean values (1.90) for dental caries in primary dentition and Group II, showed high mean values (1.48) in permanent dentition. In both the groups, decayed teeth accounted for the greatest percentage. Conclusion: The prevalence of dental caries was high in permanent dentition in group II and in group I, it was high in primary dentition. Rural areas of Mahabubnagar district were affected more with caries compared to urban areas.

Keywords: Prevalence, Dental caries, School children, DMFT/deft Index, Mahabubnagar.

INTRODUCTION

Dental caries is the most common chronic infectious disease of oral hard tissues caused by plaque bacteria. It is five times more common than asthma and seven times more common than seasonal allergies. Dental caries affects both the sexes, all races, all socioeconomic status and all age groups. Dental caries will not only cause pain but also places a financial burden on the parent [1]. The prevention of dental caries has long been considered as an important task for the health profession. Several research activities are yet continuing to make the progress in diagnosing, treating and preventing dental caries.

Various studies exist on the prevalence of dental caries in the Indian population. In the year 1940, the prevalence of dental caries in 5 to 12 year old school children in India were 55.5% and it was increased to 68% in 1960, later in subsequent years, it has reached to 89% [2, 3]. Also, in a survey of National oral health and fluoride mapping, it was found that prevalence of dental caries was about 50% in 5 year old children and close to 84% in older age population [4].

According to world health organization (WHO), the index age group of children (5, 12 & 15 years) presents a vulnerable population for the occurrence of dental caries. The age of 12 years has been considered as the global monitoring age for dental caries. Hence, the prevalence of dental caries among this age group needs to be assessed.

Dental caries is most commonly measured by the sum of decayed, missing and filled teeth (DMFT/deft index). This index is also widely used to assess the caries status at the population level for public health planning and policy-making purposes. DMFT/deft index, is a cumulative caries measure, which indicates caries occurrence including past and present dental caries. Based on DMFT values, WHO generated a scale to classify caries severity. DMFT values between 0.0 - 1.1 were very low; 1.2 – 2.6 were low; 2.7 – 4.4 were moderate; 4.5 – 6.5 were high; values exceeding 6.6 were very high [5].

In Mahabubnagar (MBNR), the oral health care systems are in developmental stages. Unfortunately, to date, the dental caries status among the school children population in Mahabubnagar has never been documented. Hence, systematic data collection regarding dental caries is vital to evaluate and plan oral health care for the school children. Therefore, the current study was planned to provide the baseline data on prevalence of dental caries among 5-12 years old school going children of rural and urban areas of Mahabubnagar.

MATERIALS & METHODS

The study was started in October 2011 and completed in march 2012. The study population consisted of children aged 5 to 12 years attending the school in Mahabubnagar (MBNR) district. The study sample consisted of 1000 children out of which 575 were boys and 425 were girls. The list of schools was prepared according to the information given by district education officer, MBNR. According to the list, schools were divided into four categories, i.e; East, West, North & South schools of Mahabubnagar and from each category about 2 schools were selected randomly. A total of 8 schools were selected for the study in which 4 are government and 4 were private schools.

The age groups of 5 to 12 years were divided into Group I – 5-8 yrs and Group II – 9-12 yrs to screen the primary, mixed and permanent dentition with caries except the third molar as it is not erupted at this age.

Each school principal and class teacher were informed about the study and invited to participate in the study. All children who are enrolled in the study were given a parent introduction letter with an attached consent form. Prior to the main survey, dental examiner performed a calibration and coding exercises for his practical experience in the study methodology. Children with the consent to participate in the survey were examined in their school, in the classrooms using a disposable mouth mirror (Denlite, Welch Allyn Ltd, Ireland) and blunt ball-ended probe (Hu-Friedy, Dental, Chicago, USA) under day light. All teeth were examined and notated in FDI two-digit nomenclature.

Based on the visual – tactile criteria, caries diagnosis was documented using DMFT/deft index. This index scores for each children were computed for primary and permanent teeth. Data was verified and subjected to statistical analysis (Statistical package for the social sciences (SPSS), Version 10).

RESULTS

A total of 1000 school children were involved in the study out of which, 481 (39.16%) belong to age group I and 519 (23.54%) belong to age group II. In Group I, 254 (26.78%) were males and 227 (29.88%) were females. In Group II, 321(73.22%) were males and 198 (70.12%) were females [Table1]. The number of caries free children among 1000 school children were 281, indicating the caries prevalence in school children in Mahabubnagar was75%.

Table 1: The total number of subject

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
Gr.I-5-8 yrs	254	26.78	227	29.88	481	39.16
Gr.II-9-12 yrs	321	73.22	198	70.12	519	23.54
Total	575	44.12	425	41.75	1000	50.01

The mean (±SD) DMFT values for Group I and II was 0.31±1.0 and1.48±2.1 respectively and the mean deft (±SD) values for Group I and II was 1.90±1.91 and 1.14±1.36 respectively. The prevalence of caries among the groups were highly significant (P<0.001). Among DMFT/deft scores DT/dt (decayed) values were high when compared to M-missing and F-filling values [Table2]. Male children exhibited a higher

mean (±SD) DMFT/deft values (0.68±1.45/1.29±1.62) when compared to females (0.66±1.29/ 1.03±1.48), but it is not statistically significant. When compared to rural and urban areas of Mahabubnagar, the children of rural areas are having more caries (0.75±1.43) when compared to urban areas (0.60±1.33), which is statistically significant (P< 0.05).

Table 2: Total DMFT/deft scores in permanent and primary dentition

		Total DMFT		Total deft	
		Mean/SD	P value	Mean/SD	P value
Age Groups	Group I	0.31/1.06	0.0000 (S)	1.90/1.91	0.0000 (S)
	Group II	1.48/2.12		1.14/1.36	
Sex	Male	0.68/1.45	0.8009 (NS)	1.29/1.62	0.0088 (NS)
	Female	0.66/1.29		1.03/1.48	
Area	Rural	0.75/1.43	0.0818 (NS)	1.05/1.66	0.0079 (S)
	Urban	0.60/1.33		1.31/1.45	

SD: Standard Deviation, NS: Not Significant, S: Significant

DISCUSSION

Dental Caries is the most prevalent oral disease worldwide. With the introduction of various significant preventive measures and generalized increased awareness among the masses there has been a changing trend concerning the distribution of dental caries among the indexed ages i.e. 5, 12 and 15 years [6]. The present study selected the age groups of 5-12 yrs based on following criteria:

1. It is likely that at these ages all primary teeth and permanent teeth except third molars will be present.
2. These age groups are considered as the global monitoring ages for international comparisons and monitoring [7].

The DMFT/ deft index using WHO diagnostic criteria to identify dental caries was employed in the present study for following reasons:

1. The majority of the published literature followed WHO criteria in diagnosing dental caries.
2. WHO excludes initial lesions from diagnostic criteria due to concerns over reliability in diagnosis resulting in unreliable data [8].

Although a plethora of studies on dental caries among different age groups in different regions of India is available, but data on dental caries have not been published from Mahabubnagar district, Telangana, India. Hence, the present study examined the prevalence of dental caries in rural and urban areas of Mahabubnagar. Mahabubnagar is located at 16.73°N, 77.98°E. It has an average elevation of 498 metres. As of 2011, MBNR had a population of 217,942, in which 110,995 are males and 106,987 are females at a ratio of 1000:964.

It was observed that the caries prevalence of group II was higher than group I where as deft of Group I was higher than group II indicating permanent dentition is effected more in 9-12 yrs age group and primary dentition is effected more in 5-8 yrs age group ($p < 0.001$).

In over all, primary dentition is having high mean deft (1.90) than permanent dentition. This was found to be similar to the results of Jensen *et al* [9] and Manji F [10]. The reason for high caries in primary dentition could be due to diet higher in sugars and inability of young child to properly brush their teeth on their own. Besides this, lack of preventive programs in the Mahabubnagar district could be another reason.

Results indicated that male children had higher mean DMFT/deft value than the female children. Similar results were found in studies done by Jain M [11] & Joyson moses *et al*, [12]. The reason may be a marked preference for sons regardless of the socioeconomic status, which leads to longer feeding of

sons compared to daughters. Whereas in a study done by Shingare *et al* [13], female children showed higher incidence of dental caries than male children due to frequent snacking habits and fluctuating hormonal levels during puberty by female children.

Children residing in rural areas of MBNR had high mean DMFT value (0.75) than children in urban areas (0.60) which is statistically significant ($P < 0.05$). This indicates that, the children of rural areas exhibited significantly increased risk for dental caries than children of urban areas. Increased dental caries in rural areas might be due to fewer advanced dental service clinics and also due to eating habits and life style differences between two groups [14].

Children from higher socioeconomic backgrounds were generally enrolled in private schools and children from lower socioeconomic backgrounds attended public schools. Hence school type was selected to assess children from different socioeconomic backgrounds. The study showed that private school children had a lower caries than public children, consistent with results reported by Piovesan *et al* [15].

CONCLUSIONS

The following findings can be concluded from this study:

1. The dental caries prevalence in children of MBNR was 75%.
2. Age group of 5 – 8 years are having high caries prevalence where compared to 9 – 12 yrs age group.
3. Male children are at more risk for dental caries than females.
4. Children of rural areas were significantly at more risk for dental caries than children of urban areas.
5. Children from higher socioeconomic status were having less caries than children with low socioeconomic status.

In MBNR, oral health programs have not launched in the school curriculum and also it is clear that the population must be educated regarding the advantages of regularly consulting a dentist. Hence, to reduce the dental caries in MBNR district appropriate oral health programs should be developed and implemented in schools and PHC's (Primary health care centers).

The data derived from our analysis should be interpreted with caution as the study design is Cross – sectional and DMFS (decayed missing and filled surfaces) were not recorded. Another limitation is use of DMFT index, which is having a disadvantage of under or over estimating the dental caries prevalence, because this index will not differentiate between initial and

advanced carious lesions, cavitated and non – cavitated carious lesions.

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