

Prevalence and self perception of Dental Fluorosis among 15 year old school children in Prakasham district of south India

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ABSTRACT

Background: To assess the Prevalence and self perception of dental fluorosis among 15 - year old school children.

Materials & Methods: A cross sectional study was conducted on 840, 15 - year old school children from 12 schools of Prakasam district. After taking informed consent from their parents or legal representatives, an interview was conducted using a pretested questionnaire to collect the data regarding self perception of dental fluorosis, dental behaviour, and source of water and diet and socio demographic characters. Oral examination was done under natural light to score Deans fluorosis index. Statistical test used was chisquare test.

Results: Study revealed that 82.04% of the study population were having dental fluorosis. Out of which only 42.3% were aware of the existing situations. 47.90% of boys are aware of dental fluorosis where as 40.50% of girls are aware of dental fluorosis. Fluorosis score in relation to gender is not statistically significant (chisquare (8.796);p=0.117).

Conclusion: Dental fluorosis is a public health problem in Kanigiri town. As there was no study conducted in Kanigiri town even though it is one of the severely affected area in our country. Active steps must be taken to De fluoridate the water before distribution to reduce the morbidity associated with dental fluorosis in this area.

Key Words: Awareness, deans fluorosis index, dental fluorosis, school children.

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Introduction

Dental fluorosis is a well known developmental enamel defect due to excessive fluoride ingestion during enamel formation, generally from chronic long term exposure to elevated levels of fluoride.¹ Water fluoridation is a recognized method for preventing

dental caries when it is undertaken at the ideal concentration for each region, according to the local mean temperature. However it is a risk factor for dental fluorosis when the fluoride concentration is above the recommended levels.²

For more than a century, fluorides have been used to prevent dental caries. Although it has been scientifically proven that small concentrations of fluoride can significantly reduce dental caries without any ill effects, the use of fluoride is still regarded as a controversial issue.³

India is one among the 23 nations around the globe where health problems occur due to excess ingestion of fluoride.⁴ Fluorosis disturbs enamel significantly and affects esthetics quite adversely which can cause psychological distress to the affected person.⁵

According to National Oral Health Survey and Fluoride Mapping-2002 - 2003, the prevalence in children aged 12 – 15 years was 7.2% in three states (Haryana, Uttar Pradesh and Andhra Pradesh), which is higher than national average.⁶

In Andhra Pradesh state alone 17 districts are affected by fluorosis. Among them Prakasham district is the second most severely affected district after Nalgonda district. First ever cases of endemic skeletal fluorosis in this area were reported from Podili, Darsi and Kanigiri areas of Prakasam district of Andhra Pradesh in 1937.⁷ The major water source in the district is Borewell. The major source of fluoride to ground water is due to the geological structure of the area rather than any contamination.⁸ Even though this place is known for endemicity of skeletal fluorosis, no study about dental fluorosis has been reported. Hence the aim of the present study is to assess the prevalence and self perception of dental fluorosis among 15 year old school children in Kanigiri town.

Materials and Methods

A cross-sectional study was conducted on 15 year old school children (840) from 12 schools of Kanigiri town of Prakasam district. A pilot study was done on a sample of 30 children in the month of July 2012 to determine the feasibility and sample size requirement for the main study. Lists of all schools were obtained from District Educational Office of Prakasam district. From the obtained list 12 schools were randomly selected from Government and private schools. Prior information was provided for School principals and students about the date and time of the data collection, written informed consent form was given and children were requested to be present on that day. From each

school all 15 years old school children (n=840) residing in Kanigiri town since their birth were included in this study. Written informed consent was obtained from their parents and verbal consent from children to participate in the study. Ethical clearance was obtained from Institutional review board of Drs. Sudha & Nageswara rao Siddhartha Institute of Dental Sciences. All the procedures followed in this study were in par with WMA declaration of Helsinki.

Inclusion criteria:

- All 15 - year old children present on the day of clinical examination.
- Children with permanent teeth with at least more than 50% of the crown erupted and no fillings on facial surface.

Exclusion criteria:

- Children other than fluorosis stains are excluded from the study.
- Children with orthodontic brackets or crowns are not included.
- Children who had migrated from some other place or who were not permanent residents of the study area.

An interview was conducted by using a pretested questionnaire to collect the demographic data, permanent address, source of drinking water and participants were asked a question about their perception about dental fluorosis i.e. whether their teeth are affected with dental fluorosis or not? Followed by ADA type III oral examination using plane mouth mirror under natural day light to know the fluorosis score using Deans fluorosis index as stipulated by WHO (1997)⁹ Data processing and analysis were done using the Statistical Package for the Social Sciences, (SPSS -17). Chi-square test was used for statistical analysis.

Results

The study subjects comprised of 840 out of which 412 boys(49%) and 428 girls (51%) school children with mean age 14.6±0.682, who are residing since birth in Kanigiri town (Table 1). Out of 840 school children 53.3% are Government and 46.7% Private schools

Table 1: Distribution of study subjects according to gender.

| Gender | Number | Percentage (%) |
|--------|--------|----------------|
| Boys | 412 | 49 |
| Girls | 428 | 51 |

Table 2: Distribution of study subjects according to school.

| Type of school | Number | Percentage (%) |
|----------------|--------|----------------|
| Government | 448 | 53.3 |
| Private | 392 | 46.7 |

children (Table 2). Prevalence of dental fluorosis is 82.04% and majority of fluorosis is seen in mild and moderate forms (21.5% and 22.1% respectively) where as only 6.9% has severe form of dental fluorosis (Table 3).

Table 3: Distribution of study subjects according to dental fluorosis score.

| Category | Boys | Girls | Total (%) |
|--------------|------|-------|------------|
| Normal | 74 | 77 | 151 (17.8) |
| Questionable | 68 | 60 | 128 (15.2) |
| Very mild | 67 | 70 | 137 (16.3) |
| Mild | 83 | 98 | 181 (21.5) |
| Moderate | 85 | 100 | 185 (22.1) |
| Severe | 35 | 23 | 58 (6.9) |
| Total | 412 | 428 | 840 |

Table 4: Response of children regarding self perception of dental fluorosis on their teeth according to private and Government school.

| Response rate of self perception of dental fluorosis. | Yes (%) | No (%) |
|---|------------|-----------|
| Government | 169 (37.7) | 279(62.3) |
| Private | 212(54.1) | 180(45.9) |

Among the study subjects from private school 54.2% perceived that they had dental fluorosis and, in Government school 37.4% perceived that they had dental fluorosis (Table 4). Among the children who perceived that they had dental fluorosis has mostly moderate (69%) and severe (31%) form of dental fluorosis which is statistically significant (Chisquare=10.778;p=0.029).

Discussion

Children who lived in the same place where they were born and who obtained drinking water from the same

source throughout their life were included in the study. As the ground water table is constantly receding and some communities have started getting piped water from the surface water in recent times, it was decided to include those children who obtained drinking water from the same source, at least in the first 10 years of their life. This amendment was done keeping in mind the fact that mineralization of all permanent teeth, except third molars is completed by 10 years.¹⁰ To measure dental fluorosis Deans fluorosis index was used. Present findings confirm that dental fluorosis constitutes a major public health problem to the community and so to the health authorities in Kanigiri town. Low cause awareness, poor knowledge about appropriate preventive measures and poor access to safe drinking water could be some factors implicated for this. Study sample comprised of 840 school

children (412 boys and 428 girls) with mean age of 14.6years. Major source of drinking water in this study subjects was ground water (49.2%).

In the present study the prevalence of dental fluorosis was 82.04%, which is differing from the study coded by Dahiya et al(2000)¹¹ showed prevalence of fluorosis is 92.73% in the village of Juai Kalan, Bhiwani district, Haryana and 100% prevalence in Nalgonda district a study coded by KM Sudhir et al(2009).¹⁰ Not much information is available on prevalence of dental fluorosis in Kanigiri town for direct comparison. Study conducted by P Srinivas, V Sudhakar et al

(2010)¹², Saravanan et al (2008)¹³, Gopalakrishnan et al (1999)¹⁴ showed prevalence of 55.14% (Khammam district), 31.4% (Chidambaram taluk) and 16.8% (Kerala) respectively, which is less when compared to present study. 54.2% of children from private schools are aware of dental fluorosis marks on their teeth, while only 37.4% of children from government schools are aware of dental fluorosis on their teeth. Majority of children belonging to lower socio economic group are not aware of dental fluorosis. Severe fluorosis was seen among children belong to lower middle socio economic group (68%), the reason may be due to their poor nutritional status when compared with high income group. Prevalence of dental fluorosis was lowest among children who consumed commercial water. Compared to urban area, the prevalence of dental fluorosis was higher in rural areas.

42.3% of the children were aware of marks on their teeth that would not brush off, where as a 57.7% were not aware of any such marks on their teeth but a study conducted by Ethel Vento et al (2011)¹⁵ in Gozo, Malta showed that 11% of the children were aware of marks on their teeth where as 83% were not aware of any such marks.

One of the limitations of this study is that the prevalence of dental fluorosis has not been related to water fluoride level in this study since there is no single unchanged source of water supply from past fifteen years in the study area. Henceforth those – response relationship cannot be established. Prevalence of dental fluorosis in Kanigiri town is nearly 10 folds higher than country wide prevalence. Even though the prevalence of dental fluorosis is high most of them are unaware of presence of fluorosis on their teeth.

Conclusion

Dental fluorosis is a public health problem in Kanigiri town. As there was no study conducted in Kanigiri town even though it is one of the severely affected area in our country. Active steps must be taken to De fluoridate the water before distribution to reduce the morbidity associated with dental fluorosis in this area.

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