

Prevalence and Severity of Dental Fluorosis in Nadiad Taluka, Gujarat, India

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ABSTRACT

Background: A cross-sectional survey was carried out in schools of Nadiad taluka for the incidence and severity of dental fluorosis. Five different schools were randomly selected from the rural areas of Nadiad taluka for the study. Total 1065 students were examined during the study period. Out of total examined students, approximately 10% of children were affected with dental fluorosis.

Keywords: Dental fluorosis, Fluoride, School children, Dean's Fluorosis Index.

INTRODUCTION

Fluoride helps in the development of teeth, bones and maintaining the health. It has great significance in preventive dentistry due to its cariostatic properties. However, excessive intake of fluoride leads to dental and skeletal fluorosis. Its abundance in the continental crust is about 626µg/g. [1] Endemic fluorosis resulting from high fluoride concentration of ground water is major health concern in Gujarat. Fluorosis is caused by ingestion of excess fluoride mainly through drinking water contamination. Due to its strong electro negativity, fluoride is attracted by positively charged calcium in teeth and bones causing dental fluorosis. [2]

The clinical appearance of dental fluorosis is characterized by lusterless opaque white patches in enamel which may become striated, mottled and/or pitted. The opaque area may become stained yellow

to dark brown. The incidence and severity of dental fluorosis is significantly influenced by fluoride intake. This study was aimed to find out prevalence and severity of dental fluorosis.

MATERIAL AND METHODS

A cross-sectional survey was conducted among the children attending free dental check-up camps held by the department of Public Health Dentistry, Faculty of Dental Science, Dharmsinh Desai University. In the first stage, five public schools were randomly selected from the rural areas in Nadiad taluka to record dental fluorosis in children, residing in the villages since childhood and consuming the groundwater. Official permission was obtained from the concerned authorities to conduct this study. In the second stage, the students

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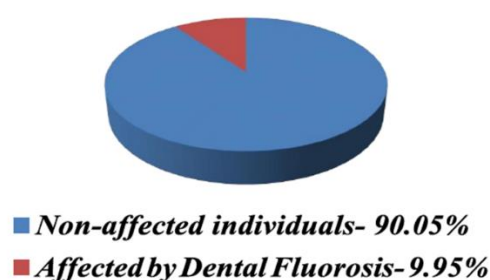
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Table 1: Sample Distribution According to Age and Sex.

Age group	No. of individuals	Non-affected children	Affected children			
			Males		Females	
			No.	%	No.	%
9-11	350	328	10	9.43	12	11.32
12-14	393	354	16	15.09	23	21.65
14-17	322	277	20	18.87	25	23.58
Total	1065	959	46	43.39	60	56.61

Table 2: Distribution According to Severity (Dean's Fluorosis Index).

Grades Of Fluorosis	No. of individuals	Percentage (%)
Normal	959	90.05%
Questionable	0	0%
Very Mild	17	1.59%
Mild	38	3.57%
Moderate	42	3.94%
Severe	9	0.84%



Graph 1: Prevalence of Dental Fluorosis.

aged from 9-17years were selected based on purposive sample method. As it is uncommon to see dental fluorosis in primary dentition, students above the age of 9 years were selected, who has minimum 8-10 permanent teeth in the oral cavity. [3] Total 1065 subjects were included in this survey. The study was conducted in two parts. In the first one general information like name, age, sex and address were obtained. In the second part, assessment of dental fluorosis was done according to Dean's fluorosis index, which ranged from 0-4. [2,8]

- 0: Normal enamel
- 0.5: Questionable mottling- few white flecks/ white spots.

- 1: Very mild mottling- few white opaque areas covering less than 25% of tooth surface.
- 2: Mild mottling- white opaque areas which are more extensive but do not involve >50% of tooth surface.
- 3: Moderate mottling- all enamel surfaces are affected and brown stains are present.
- 4: Severe mottling- all enamel surfaces are affected, discrete/confluent pitting, widespread brown stains present, corroded appearance is seen.

RESULT

Table 1 depicts the number of male and females affected by dental fluorosis on the basis of three different age groups. According to the table, 43.39% males and 56.61% females out of 1065 students were affected by dental fluorosis. Dental fluorosis is more prevalent in females than in males by 13.22%. Also, as age increased, the number of people affected by dental fluorosis also increased. The pie chart illustrates that out of 1065 students dental fluorosis were observed in 106 (9.95%). Table 2 shows that most of the people had normal teeth which are scored as '0' according to Dean's fluorosis index. [5] Furthermore, from the affected individuals,

majority of them are listed under the 'moderate' category (3.94%) followed by 'mild' (3.57%), 'very mild' (1.59%) and 'severe' (0.84%).

DISCUSSION

There are hardly any studies conducted regarding dental fluorosis in this area, so, accumulation and comparison of data from different studies with comparative groups is difficult. [5] In India, 15 states have been identified as endemically fluorosed areas with Gujarat being one of them having high fluoride distribution in many areas like Ahmadabad, Amreli, Anand, Kutch, Vadodara, Surat and many more. [6] The study conducted by Groundwater Resources of Gujarat, 2011, Kheda district, it has been shown that the fluoride content of water in Kheda District are within normal limit. However, fluoride content in water of Balasinor and Matar was 2.30mg/l and 2.80mg/l, respectively. [7] According to this cross-sectional survey conducted in Nadiad taluka, out of 1065 children, 106 which is approximately 10% are affected with dental fluorosis. Hence, it is suggested that more water samples should be collected and reanalyzed for its fluoride content.

While discussing effects of fluoride in drinking water on dental fluorosis, one major confounder may be for those who stay currently in high or normal fluoride areas. [11] As per the study conducted on the prevalence of dental fluorosis among school children residing in Kanpur city, Uttar Pradesh showed that most of the affected individuals were in the category of mild fluorosis followed by moderate, severe, questionable and very mild fluorosis according to Dean's fluorosis index. [4] In contrast, our study showed that most of the affected individuals are in moderate category and least in questionable.

As per this study, only 9.95% out of 1065 people are affected by dental fluorosis which is less significant compared to other areas. Choubisa reported the prevalence of dental fluorosis as 45% among the villages of southern Rajasthan. [9] Another study conducted in villages of Maharashtra also found prevalence of dental fluorosis as 43%. [10] Fluorosis starts at early as 8 years in children. Hence the people must be educated about dental fluorosis so that problem can be prevented at proper time. [1] In conclusion, our findings showed that prevalence of dental fluorosis is 9.95% with majority of children

belonging to 'moderate' category. The prevalence of dental fluorosis was found to increase with increase in age. Also, it was noticed that females were affected more than males.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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