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DENTAL FLUOROSIS;
INCIDENCE IN SCHOOLCHILDREN AGE 12-15 YEARS IN GOJRA, PAKISTAN.

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ABSTRACT… Objectives: To assess the incidence of dental fluorosis in schoolchildren aged 12 to 15 years resident of Gojra, Pakistan. **Study Design:** Cross sectional study. **Setting:** 10 Different Public Schools of the City Gojra. **Period:** May to July 2017. **Method:** 526 volunteers were examined in ten public schools of Gojra. The examination was performed in the school playground by three dentists after tooth brushing under observation by a hygienist. Before examination cotton pellets were applied on the teeth surfaces to remove the moisture and make them perfectly dried and were examined in day light, with the use of an explorer, a mouth mirror and tongue depressor. Dental fluorosis score was formulated using Dean's index. **Result:** Dental fluorosis was documented in nearly 18.44% of the examined schoolchildren. Maximum children were presented with questionable condition (7.60%) and then followed by very mild (5.13%). The severity rate was 0.76%. **Conclusion:** Incidence of dental fluorosis was in accordance with other studies results done in the past. Fluoride is a crucial mineral and helps in controlling the caries but it's use must be in the normal range according to the demand of that area.

Key Words: Oral Health, Epidemiological Study, Fluoride, Dental Fluorosis.

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INTRODUCTION

Dental caries is one of the most prevalent diseases of the children. Fluoride is helpful in preventing dental caries.[1] On the other hand, over use of fluoride through any source i.e. (fluorinated water or other sources) give rise to other side effects, which results in impaired dental and skeletal development depending on the subjection to fluoride and the duration of its exposure. So, it is very important that fluoride consumption should be within safe level to avoid its adverse effects.[2]

Dental fluorosis is basically enamel hypoplasia that usually occur due to over exposure to ingested fluoride than its optimum level. Enamel fluorosis is a useful biological marker to indicate the level of fluoride subjection and has been used to indicate optimum level for water fluoridation.[3] Mottled enamel (developmental changes in enamel) induced by fluoride was first described by McKay and Black (1916).[4]

The main sources which are most probably responsible for increased fluoride consumption are fluorinated water, fluoride supplements, toothpastes, gels and mouth rinses containing fluoride.[5] Fluoride is usually termed as "double edged weapon" because of its double action.[6] When it is used in its optimum range, helps in preventing caries but when it is used above the safe level, it causes dental and skeletal fluorosis.

Different forms and shapes of dental fluorosis are seen based on fluoride dose and duration for which tooth is exposed to the fluoride during amelogenesis.[7] The duration of subjection to fluoride is also important. Post eruptive staining is due to some exogenous source (after tooth eruption) and is not because of fluoride over exposure during enamel formation. This is one of the drawbacks of some fluorosis indexes that take account these stains when assessing the severity.[8] This may be able to mislead us while accessing the results.

MATERIAL AND METHODS

This study was done in 10 different public schools of the city Gojra. The permission was taken from the authorities of the schools prior to perform the study. And written permission was also taken from the parents and guardians of the children taking part in that study. School children were examined during May 2017 to July 2017. Under this study 526 school children were randomly examined.

The study was performed on the age group of children from 12- 15 years of age who were born and brought up in the city Gojra to evaluate the incidence of dental fluorosis.

The examination was performed in the school playground by three dentists after tooth brushing performed by the children and supervised by a dentist. Before examination, cotton pellets were used for making the teeth surfaces moisture free and inspection was done under light, by using an explorer, a mouth mirror and a tongue depressor. Dental fluorosis score was assessed by Dean's index.

RESULTS

Dental fluorosis was detected approximately in 18.44% of inspected schoolchildren (n=526), 7.60% was detected with questionable state, 5.13% were having very mild fluorosis and 3.23% scored mild fluorosis. Moderate fluorosis was in 1.71% children. Severity of dental fluorosis was seen only in 0.76%. Table-I.

Fluorosis scores. (Dean's Index)	n	%
Normal	429	81.56%
Questionable	40	7.60%
Very mild	27	5.13%
Mild	17	3.23%
Moderate	9	1.71%
Severe	4	0.76%

Table-I. Incidence of dental fluorosis in schoolchildren age 12-15 years old.

The incidence of dental fluorosis was less in 14-15 years old children as compare to other age group. There is no significant difference between the genders. Table-II.

Age	Male (n)	Female (n)	% of children presenting fluorosis	(n) Total of children examined
12-13	(69)39.42%	(74) 42. 28%	(32)18.28%	175
13-14	(70) 40.69%	(64) 37.21 %	(38) 22.1 %	172
14-15	(59) 32.69%	(93) 51.95%	(27) 15.1%	179
Total	(198) 37.64%	(231) 43.91%	(97) 18.44 %	526

Table-II. Distribution of dental fluorosis in accordance with age and gender and the total number of schoolchildren inspected in Gojra.

DISCUSSION

The incidence of dental fluorosis was seen in 99 children among total examined boys and girls (526). Total incidence of fluorosis was 18.821% and the individual score of girls was 18.21% and for boys it was 19.51% that is a slight difference.

Kotecha PV, et al. observed in their study, the incidence high of dental fluorosis was high 49.26%, in the endemic area of district Gujrat, India.[9] The high level of fluoride in drinking water was the cause of that high incidence of fluorosis. Ramires I, et al. also observed high incidence of dental fluorosis in Brazil that was 35.58%.[10]

Khan SQ, et al. reported 33% incidence of dental fluorosis among 6-12 years aged children living in Dammam and Khobar, Saudi Arabia.[11] Dubey HV.et al. in his study, conducted in Bharatpur city, India, concluded that the prevalence of fluorosis in government school children was significantly high as compare to private schoolchildren that significant difference was because of different fluoride levels in school water supplies.[12]

Dental fluorosis is a diffuse symmetric hypomineralization disorder of ameloblast. It usually occurs when a person is subjected to high fluoride level during the first eight years of life because permanent dentition develops during that period. Dental fluorosis is an irreversible process, once it develops, it is permanent.[13]

Tahir MA.et al. quoted in their article, "Health impacts from long-term use of various ranges of fluorinated water have summarized as below;

- Dental caries <0. 5 mg/L
- Promotes dental health 0.5-1.5 mg/L
- Dental fluorosis 1.5-4 mg/L
- Dental, skeletal fluorosis >4 mg/L
- Crippling fluorosis >10 mg/L"[2].

In the present study, if we ignore the questionable state, the highest incidence of dental fluorosis was seen with very mild (5.13%) followed by mild (3.23%). Moderate state with incidence rate 1.71% got the third place. Rizwan S, et al. reported 12% incidence of dental fluorosis in study.[14]

Khan AA, et al. reported in their study, 987 water supplies in Pakistan are especially low in fluoride level, 84% having fluoride level below 0.7ppm.[15] Our results are in accordance with his studies because incidence of dental fluorosis is not high, and high incidence rate of dental fluorosis is usually coincide with high fluoride level. Dental fluorosis can also occur due to excessive ingestion of dental fluoride i.e. toothpastes, gels and mouth rinses containing fluoride and fluoride supplements other than drinking water containing fluoride.[7] Fluoride is very important content as it helps in preventing dental caries. Its use should be according to the demand of the dweller of that area. The incidence of dental fluorosis was seen mostly in maxillary teeth and its incidence in mandibular teeth was relatively very low. Our results are in accordance with Mehta DN, et al.[16]

CONCLUSION

The incidence of dental fluorosis in the present study is not very high, fluoride is an important content as it is involved in remineralization process of the enamel and controls dental caries. So, its use must be in optimum dose, as low level results in caries and high results in dental fluorosis.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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