

PREVELENCE OF DENTAL FLUOROSIS AMONG 5-15 YEARS SCHOOL GOING CHILDREN IN NADENDLA MANDAL,GUNTUR DISTRICT

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ABSTRACT

The study conduct by NADENDLA MANDAL,GUNTUR DISTRICT. 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. A cross sectional study was conducted among 300 school going children. After taking informed consent from their parents and legal representatives, an interview was conducted using a structured questionnaire to collect the data regarding demographic details and awareness of dental fluorosis.

Study revealed that 77.3% of the study populations were having fluorosis. Awareness of dental fluorosis marks on their teeth according to private and government schools, in which 37.3% and 47.1% of government and private school children are aware of marks on teeth and difference observed was statistically significant. Dental fluorosis in common in school children in age range 5-15 years of age. Girls were more commonly involved as compared to boys. Water fluoridation above 1.2ppm was cause of dental fluorosis.

Keywords: Children, Dental fluorosis, School going children, enamel

Introduction

Dental fluorosis is a health condition caused by a child receiving too much fluoride during tooth development. The critical period of exposure is between 1 and 4 years old; children over age 8 are not at risk. **McKay FS (1916)[1]**. In its mild form, which is the most common, fluorosis appears as tiny white streaks or specks that are often unnoticeable. In its severest form, which is also called mottling of dental enamel; it is characterized by black and brown stains, as well as cracking and pitting of the teeth. **Fejerskov O(2003) [2]** .

It is well documented that fluoride can have both beneficial and detrimental effects on the dentition ever since Mc Kay and G.V. Black in 1916 published the effect of fluoride on dentition. **Dean HT(1934) [3]** .The beneficial effects of fluoride on dental caries are due primarily to the topical effect of fluoride after the teeth have erupted in the oral cavity. In contrast, detrimental effects are due to systemic absorption during tooth development resulting in dental fluorosis..**Dean HT, McKay FS(1919),[4]** developed a classification for fluorosis, which is still widely used, based on his interpretation of clinical appearance. **Fejerskov O(1974) [5]**. Dean and Mckay suggested that optimum level of water fluoride should be below 0.9 - 1.0 PPM. **Richards A et,al.,(1986) [6]** .The severity of dental fluorosis depends on the amount of fluoride exposure, the age of the child, individual response, as well as other factors including nutrition **Thylstrup A.[7]** Although water fluoridation can cause fluorosis, most of this is mild and not usually of aesthetic concern. **Aoba T [8]**. Severe

cases can be caused by exposure to water that is naturally fluoridated to levels well above the recommended levels, or by exposure to other fluoride sources such as brick tea or pollution from high fluoride coal. **William J (1985) [9]**

The earliest manifestation of dental fluorosis is an increase in enamel porosity along the striae of Retzius. **Anurag Tewari,(2009)[10]** Clinically, the porosity in the subsurface of enamel reflects as opacity of the enamel. With an increased exposure to fluoride during tooth formation, the enamel exhibits an increased porosity in the tooth surface along the entire tooth surface. Very severely hypo mineralized enamel will be very fragile and hence as soon as they erupt into oral. They undergo surface damage as a result of mastication, attrition and abrasion. The definite evidence that fluoride can induce dental fluorosis by affecting the enamel maturation was given by Richards *et al.*[10] Thylstrup and Fejerskov proposed a way of recording dental fluorosis (Dean's index) based on the histopathological features. **M.C Cay (2010 [11]** Human and animal studies have shown that the enamel hypomineralization in fluorotic teeth are due to aberrant effects of fluoride on the rates at which enamel matrix protein breakdown or rates at which the byproducts of enamel matrix degradation are withdrawn, resulting in retardation of crystal growth in enamel maturation stage. **Shortt WE (1937)[12]**

For more than a century, fluorides have been used to prevent dental fluorosis. Although it has been scientifically proven that small concentrations of fluoride can significantly reduce dental Fluoride without any ill effects, the use of fluoride is still regarded as a controversial issue. Fluorosis has attained an alarming dimension all over the world. In India 19 states have been identified as endemic fluoride areas and Andhra Pradesh state is one among them which is facing serious health problems. The fluoride level in water in India ranges from 2- 29ppm, where as the permissible level in drinking water according to WHO standard is 1.0- 1.5ppm. High incidence of endemic fluorosis in India is due to fact that large area of the water supplies are having high level of fluoride. In Andhra Pradesh state alone 17 districts are affected by fluorosis, among them Guntur district is the most severely affected district. The major water source in the district is As there were no studies conducted in this area, even though it is severely affected with fluorosis, hence the present study was conducted to assess the awareness of dental fluorosis and to evaluate the prevalence of dental fluorosis.

Materials and Methods:

Study area :

Nadendla Mandal of Guntur district, Andhra Pradesh we hadb selected villages that effected by fluoride in ground water, boarwell and where there is significant occurrence of dental fluorosis. That report indicating that the area was dental fluorosis. Majority of people oin study area belong to low socio economic class. Chirumamilla, Sathuluru and subbayapalem villages are the most effected by fluorosis. This villages are located at western part of Guntur district. It is about 35 km away from the Guntur city.

Data was collected from 5-15yrs old children who were life long residence of Chirumamilla,Sathuluru and subbayapalem villages of Nadendla Mandal of Guntur district, Andhra Pradesh and who consumed drinking water from the some source of there life. Data was collected to the observed by school children. This servey carried out for problem causes due to high fluoride concentration in drinking water which causes dental fluorosis in children. Most of the children with clinical signs of dental fluorosis had moderate to severe dental fluorosis according to dean's index.

Classification of the dental fluorosis severity degrees according to **DEAN's** fluorosis

Index:

Questionable. The enamel represents the usual translucent semivitriform (glass-like) type of structure. The surface is smooth, glossy and usually of pale creamy white color

Very Mild. Small, opaque, paper white areas scattered irregularly over the tooth but not involving as much as approximately 25% of the tooth surface. Frequently included in this classification are teeth showing no more than about 1 – 2mm of white opacity at the tip of the summit of the cusps, of the bicuspid or second molars.

Mild. The white opaque areas in the enamel of the teeth are more extensive but do involve as much as 50% of the tooth.

Moderate. All enamel surfaces of the teeth are affected and surfaces subject to attrition show wear. Brown stain is frequently a disfiguring feature.

Severe. All enamel surfaces are affected and hypoplasia is so marked that the general form of the tooth may be affected. The major diagnostic sign of this classification is discrete or confluent pitting. Brown stains are widespread and teeth often present a corroded-like appearance.

Dean's fluorosis index was first published in 1934 by H. Trendley Dean. The index underwent two changes, appearing in its final form in 1942. An individual's fluorosis score is based on the most severe form of fluorosis found on two or more teeth.

QUESTIONNAIRE

Keeping in view of the scope and objectives of the study, interview schedule was prepared. A structurally well prepared and pre tested questionnaire was developed after perusal of the available literature. Thus, the final interview schedule consists of all the relevant items such as profile characteristics, etc., for measuring the variables included in the study. After pre-testing the questionnaire at the proposed study area, necessary modifications were incorporated. The finalized questionnaire which was used in the interview schedule for obtaining the primary data is appended herewith. Name, Age, Sex, Habitate, Education, No.of family members, Occupation, Sources of drinking water amount of water consumed, Type of toothpaste, Residence, How many times brushing per day, have you ever considered teeth whitening, how often do you make dental visit, consumption of tea and sea fish per day etc..

Severity of the dental fluorosis was assessed by deans index with the help of dentist and total samples are tested and classified according to the severity of dental fluorosis. The classification was divided questionable, very mild, mild, moderate and sever. The study involves collection of both primary and secondary data. The primary data was collected from the selected victims of dental fluorosis with the help of duly pre-tested questionnaire. the secondary data was regard to reports of the rural water supply and sanitation department Guntur in the study area.

Result and discussion:

Nadendla mandal of Guntur district, Andhra Pradesh India seems to be threaten area of fluoride in dental fluorosis total 12 fluoride effected villages has been find out with the help of rural water supply and sanitation department Guntur and water samples had been taken for the analysis of water fluoride content. Water samples from different bore wells of 12 villages which showed a maximum range of 0.8 to 1.0 ppm by DEAN's method. Among 12 villages are showing high levels of Fluoride. Almost all the selected villages are higher than the permissible level of 1 ppm according to WHO (World Health Organization,1984).

The Moderate type is higher(32.06%),and Mild type is lower(10.12%), Questionable type is (15%),Very mild is (17.12%), Sever is (26.12%). Particularly Chirumamilla(5.50), Kanaparru (5.52), in Nadendla mandal, has excess levels of fluoride.

We find mean standard deviation of the total children of the sample and the mean value is and the standard deviation is the data was presented in percentage to understand the nature of the level Of knowledge the diseases of dental fluorosis

Table: 1 Systematic representation of the sample

S.NO	NAME OF THE VILLAGE	BOYS	GIRLS
1.	Chirumamilla	40	45
2.	Chandavaram	22	38
3.	Sathuluru	65	55
4.	Endugapalem	30	30
5.	Nadendla	20	28
6.	Appapuram	28	32
7.	Kanaparru	29	20
8.	Mallayapalem	36	20
9.	Sankranthipadu	29	30
10.	Bukkpuram	30	35
TOTAL.		339	334

Detailed information and classification of the samples according to boys and girls are represented in the table: 1. The total number of the villages are 10, number of the boys are 339 are (52%) and girls are 324(48%).

Table: 2. Classification of effected children in the region

NAME	QUESTIONABLE		VERY MILD		MILD		MODERATE		SEVER	
	Boys	girls	BOY	GIRLS	BOY	GIRLS	BOY	GIRLS	BOY	GIRLS
Chirumamilla	5	10	4	15	5	12	22	6	4	7
Chandavaram	3	10	0	5	6	8	12	15	1	0
Sathuluru	6	12	3	22	9	11	41	6	6	4
Endugapalem	8	10	6	10	7	8	9	2	0	0
Nadendla	4	5	3	6	3	6	9	3	1	0
Appapuram	1	4	0	8	6	6	19	4	2	0
Kanaparru	6	6	4	3	6	6	9	4	4	1
Mallayapalem	7	5	12	4	9	3	5	6	3	2
Sankranthipadu	4	3	6	2	12	4	6	8	1	3
Bukkpuram	8	8	3	5	9	4	10	15	2	3

The responds of every village of the region are classified according to deans index and gender represented in the table: 2. In this classification the questionable type of the represents is The above table represents to effected children in the region. Total 10 villages Children were observed according to Dean's index.

Table: 3. Classification of effected children in the age

TYPE	7-9 Years		10-12 years		13-15 YEARS		TOTAL	PERCENTAGE
	Boys	Girls	Boys	Girls	Boys	Girls		
QUESTIONABLE	20	17	28	20	28	18	131	15%
VERY MILD	21	22	18	10	25	20	116	17.12%

MILD	20	5	40	4	20	5	96	10.21%
MODERATE	27	36	25	40	25	20	173	32.06%
SEVER	15	32	20	40	10	20	137	26.12%
TOTAL	105	113	135	104	114	77		

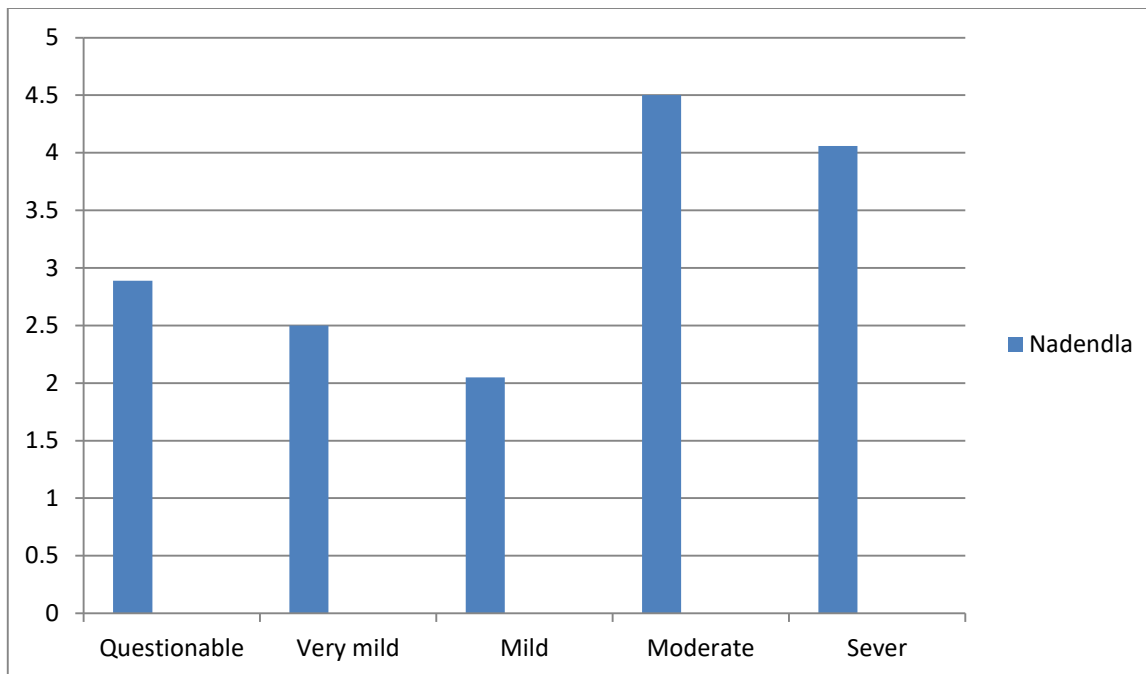
The information represented based on the age view and it is tabulated as above table: 3. Based on the age it was divided into Three types. Those are 7-9 years, 10-12 years and 13-15 yrs. Boys and Girls data are represented separately. The percentage was calculated and recorded in the table. Questionable (15%), Very Mild (17.12%), Mild (10.21%), Moderate (32.06%), Sever (26.12%).

Accurate of enamel fluorosis



Fig.1: dental fluorosis (Deans grading) (A) Questionable (Grade1), (B) Very mild(grade2), (C) Mild(Grade3), (D) Moderate (Grade 4), (E) Sever(Grade 5).

Figure1: Graphical representation of effected Children of Dental Fluorosis in Nadendla Mandal



Conclusion:

Dental fluorosis still exist as a major dental public health in India: measures need to be taken to control this by introducing defluorodisation plants in various parts of the country. The great need for introducing various small scale methods of defluorodisation in the present study area to prevent dental fluorosis. In the present study, it can be concluded that children of Chirumamilla, Sathuluru and subbayapalem village's of consuming water more than 1.5 ppm of fluoride ranges from 1.53-5ppm are suffering from dental fluorosis.

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