

## Awareness On Dental Fluorosis In Mangalagiri Mandal ,Guntur District

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### ABSTRACT:

Aim of this study is to assess the association between water fluoride levels and prevalence of dental fluorosis among school children in Mangalagiri mandal,Guntur district. During the year of study 2017-18. The survey is done to assess the dental fluorosis among school children and to create awareness among them. Fluorosis is an important public health problem in 24 countries of the world . It is caused by exposure to continuous high levels of fluoride and to a certain extent from fluoride containing food items . A continuous level of 1.5 ppm per liter and above in drinking water is considered hazardous for the health of bone and teeth. Dental fluorosis is mostly seen in children when the exposure is between 5-15yrs of age and mostly occurs in children below 12 years of age .Children and adolescent are found to be the main victims by some researchers. with the fluoride concentration of 2.01-5.37 ppm. Children aged between 5 and 15, with permanent teeth, were examined for dental fluorosis using Dean's index, as per WHO criteria. Required relevant information regarding risk factors was obtained through a questionnaire. This survey may aid in creating awareness about fluorosis among school children. From this survey, it was seen that majority of the participants were aware of dental fluorosis and believed that it can be treated. They also considered tooth bleaching as the best option for treating fluorosis.

**Keywords:** Dental fluorosis, School going children, Awareness

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### I. INTRODUCTION

Fluoride, helps in the development of teeth and bones and for maintaining the health. It has great significance in preventive dentistry due to its cariostatic properties **World health organization(1994)**. However, excessive intake of fluoride leads to dental and skeletal fluorosis. Its abundance in the continental crust is about 626 µg/g **Henderson P(1982)**. 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, teeth mottling, skeletal fluorosis and deformation of bones in children as well as in adults **Susheela AK(1993)**. The clinical appearance of dental fluorosis is characterized by lusterless opaque white patches in the enamel which may become striated, mottled and/or pitted. The opaque areas may become stained yellow to dark brown. The affected teeth may show a pronounced accentuation of the perikymata and, in more severe cases, multiple pits and larger areas of hypoplasia of the enamel appear so that the normal morphology of the tooth is lost. Abrasion techniques can be successfully employed for discolouration presented either as single line discolouration or patchy type of discolouration

ration **Wong FS,et.al ,(2002)**. Both the bleaching technique and abrasion procedures could be employed only for mild to moderate grade fluorosis. **Seale NS et,al,(1985)**. Most of the times, a combined treatment regimen of bleaching and abrasion procedures is employed to produce the desired aesthetic result in patients with yellowish discolouration due to fluorosis. Vital bleaching is more successful for fluorosis in younger patients presenting with opaque to orange colour stain rather than older patients with darker type of brown stains. Composite veneers are used when time restriction is given by patient **Roberson et.al,(2002)**. Occurrence of fluoride in groundwater has drawn worldwide attention due to its considerable impact on human physiology **Kundu N,et. al,(2001)**. Small doses of fluoride have beneficial effects on the teeth by hardening of enamel and reducing the incidence of caries, but excessive intake of fluoride results in dental and skeletal fluorosis **Billings RJ,et. al,(2004),Chaturvedi AK,et.al,(1998)**. Fluorosis is endemic in almost two-third states in India. Excess fluoride in groundwater is mainly the key factor **Sunitha V,et.al, (2008)**. India lies within the geographical fluoride belt that extends from Turkey to China. Nearly 12 million of the 85 million tons of fluoride deposits on the Earth's crust are found in

India **Mollert IJ,et.al,(1993)**. It is therefore not surprising that dental fluorosis is endemic in 17 states of India **Susheela AK,(1999),Susheela AK(1999), Eight districts identified as fluorosis endemic(2006)**.The maximum tolerance limit of fluoride specified by the World Health Organization (WHO, 1984) is 1.5 mg/l **gopalakrishna,et. al,(1999)**. WHO (1984) has suggested a cut-off level of 1.5 ppm of fluoride, but some experts say that a lower level of 1.0 ppm as safe limit in tropical climates like in India, where higher amounts of drinking water is consumed. Previous studies showed that the proportion of water sources having 1.0 ppm of fluoride was the highest **kumar RH,et.al,(2007)**. About 62 million people are at risk of developing fluorosis from drinking high-fluoride ion water in India. Six million children below the age of 14 years are affected. Dental fluorosis is endemic in 150,000 villages in India **Outbreak(2006)**.

## II. METHODOLOGY

The present survey was carried out in Six villages of Kaza,Chinnakakani,yerrabalem,Nidamaruru, Nowluru of Mangalagiri mandal in Guntur district. From the identified district of Guntur,out of 57 mandalas in Guntur district 1 Mandal (sub unit district) Mangalagiri were selected purposively based on the reports of the rural water supply and sanitation department Guntur . In The demographic area of these mandal are 16°10'30"N 80°11'10"E , 13°43'22"N 79°03'15"E Dean's fluorosis index was first published in 1934 by H. Trendley Dean The index underwent two changes, appearing in its final form in Rojier RJ 1942.. In each villages we select twenty five samples. The children aged between 9 and 15 years who were the life-time residents of the respective villages were selected for this study. A child was considered to be a continuous resident in this area if he/she had been born and lived all his/her life in that area except for short intervals, as during holidays, etc.

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 bicusps 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.

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. Score 0 is considered normal when the enamel represents the usual translucent semivitriform structure. The surface is smooth and glossy. Score 1 represents when the enamel discloses slight aberrations from the translucency of normal enamel, ranging from few white flaks to white spots. Score 2 represents small, opaque white area irregularly scattered over tooth but not involving as much as 25% of tooth surface. Score 3 shows white opaque areas in enamel of tooth but do involve as 50% of teeth. Score 4 has all enamel surfaces that are affected and attrition. Brown staining is also present. Score 5 shows hypoplasia and discrete pitting. There is brown staining and corrode like area.

### 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, Habitat ,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 severe. 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.

### III. RESULT

Mangalagiri mandals of Guntur district, Andhra Pradesh India seems to be threaten area of fluoride in dental fluorosis total 7 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 7 villages which showed a high range of (2.01 to 5.34) ppm fluoride level by DEAN's method. Among 7 villages 7 are showing high levels of fluoride. Almost all the selected villages are higher than the permissible level of 1 ppm according to WHO(1984).

The mild type is (10%), and sever type is lower(9%), Questionable type is (28%), Very mild is (20%), Moderate is(33%).

Particularly Kaza (3.35ppm), Chinnakakani(3.5ppm) and Nowluru(2.84ppm) in Mangalagiri mandal have excess levels of fluoride in Drinking water.

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 about the diseases of dental fluorosis.

**Table:1** Systematic representation of the sample

S.NO	NAME OF THE VILLAGE	BOYS	GIRLS
1	KAZA	31	29
2	CHINNAKAKANI	30	35
3	INDAMARRE	22	30
4	NOWLURU	30	20
5	YERRABALEMI	40	30
6	BETHAPUDI	27	20
7	ATHIMAKUR	30	15
TOTAL		210	179

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 7, number of the boys are 210 are (58%) and girls are 179(42%).

S.No	Name of the villages	Questionable		Very Mild		Mild		Moderate		Severe	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
1	KAZA	10	7	4	6	13	7	5	3	3	2
2	CHINNAKAKANI	9	11	10	5	10	10	4	3	2	1
3	INDAMARRE	10	5	6	4	12	10	3	2	3	2
4	NOWLURU	8	12	7	3	5	5	5	2	2	1
5	YERRABALLEMI	6	5	7	8	10	10	10	5	5	4
6	BETHAPUDI	4	6	5	3	6	4	8	6	2	3
7	ATHIMAKUR	7	3	3	2	5	10	6	4	4	1

**Table: 2.** Classification of effected children in the region

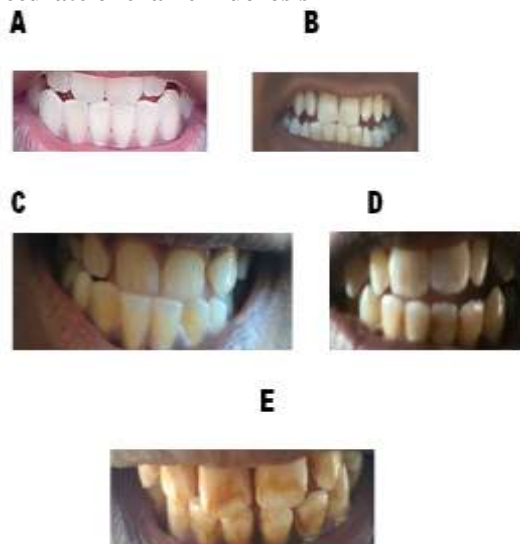
The responds of every village of the region are classified according to deans index and gender represented in the table:2. In this classification the questionable type of the represents is The above table represents about effected children in the region of Mangalagiri mandal. Total 7 villages childrens were observed according to deans index.

TYPE	7-9 YEARS		10-12 YEARS		13-15 YEARS		TOTAL	PERCENTAGE
	BOYS	GIRLS	BOYS	GIRLS	BOYS	GIRLS		
QUESTIONABLE	10	14	16	19	20	15	102	28%
VERY MILD	15	10	11	11	16	10	73	20%
MILD	10	7	12	8	15	9	61	16%
MODERATE	20	15	21	19	20	20	115	33%
SEVERE	9	4	0	3	5	0	40	9%
TOTAL	72	50	60	60	66	62		

**Table: 3.** Classification of effected children in the age

The information represented based on the age view and it is tabulated as above table:3. Based on the age it was divided into two types. Those are 7-9, 10-12 years and 13-15 yrs. Boys and girls data are represented separately. The percentage was calculated and recorded in the table. The mild type is (10%), and sever type is lower(9%), Questionable type is (28%), Very mild is (20%), Moderate is(33%).

**Accurate of enamel fluorosis**



**Fig.1: dental fluorosis (Deans grading)**  
(A) Questionable (Grade 1), (B) Very mild (grade 2), (C) Mild (Grade 3), (D) Moderate (Grade 4), (E) Severe (Grade 5).

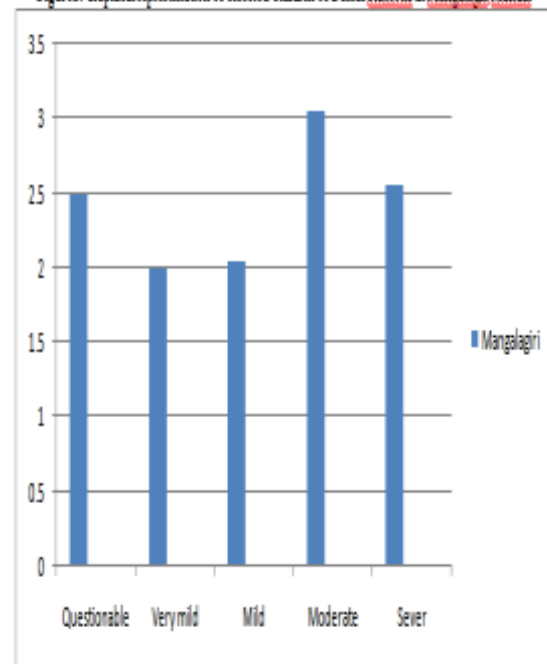
**IV. CONCLUSION:**

Presence or absence of dental fluorosis in permanent teeth was significantly associated with fluoride concentration in drinking water. Once present, its severity was determined by nutritional status of the children – malnourished children exhibiting severe form of fluorosis. This survey

**REFERENCE**

[1]. World Health Organization. Fluorides and oral health. WHO technical report series 846. World Health Organization: Geneva; 1994.  
[2]. Henderson P. Inorganic Geochemistry. Oxford: Pergamon Press; 1982. p. 32-5.  
[3]. Susheela AK, Kumar A, Bhatnagar M, Bahadur M. Prevalence of endemic fluorosis with gastro intestinal manifestations in people living in some north Indian villages. Fluoride 1993;26:97-104.  
[4]. Wong FS, Winter GB. Effectiveness of microabrasion technique for improvement of dental aesthetics. Br Dent J 2002;193:155-8.  
[5]. Seale NS, Thrash WJ. Systematic assessment of colour removal following vital bleaching of intrinsically stained teeth. J Dent Res 1985;64:457-61.  
[6]. Roberson, Heymann, Swift. Sturdevant's Art and Science of Operative dentistry. Additional conservative esthetic procedures. 4 th ed. Missouri: Mosby; 2002. p. 610-2  
[7]. Kundu N, Panigrahi K, Tripathy S, Munshi S, Powell MA, Haul BR. Geochemical appraisal of fluoride

**Figure1: Graphical representation of effected Children of Dental Fluorosis in Mangalagiri Mandal**



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contamination of groundwater in the Nayagarh District of Orissa, India. Environ Geol 2001;41:451-60.  
[8]. Billings RJ, Berkowitz RJ, Watson G. Teeth. Pediatrics 2004;113:1120-7.  
[9]. Chaturvedi AK, Pathak KC, Singh VN. Fluoride removal from water by adsorption on china clay. Appl Clay Sci 1998;3:337-46  
[10]. Sunitha V, Ramakrishna Reddy M. Fluoride in ground water and fluorosis. e-Journal Earth Science India: [www.earthscienceindia.info](http://www.earthscienceindia.info) 2008;1:1-8  
[11]. Mollert IJ. Endemic dental fluorosis. In : Prabhu SR, Wilson DF, Daftary DK, Johnson NW, editors. Oral diseases in the tropics. Oxford University Press: Delhi; 1993. p.68.  
[12]. Susheela AK. Fluorosis management programme in India. Curr Sci 1999;77:1250-6.  
[13]. Susheela AK. State of Art report on the extent of fluoride in drinking water and the resulting endemicity in India, 1999. UNICEF Report  
[14]. Eight districts identified as fluorosis endemic. [Last accessed on 2006 Nov 22]. Available from: <http://www.hindu.com/thehindu/2001/06/09/stories/0409223v.htm>.

- [15]. Gopalakrishnan, Vasan RS, Sarma PS, Nair KS, Thankappan R. Prevalence of dental fluorosis and associated risk factors in Alappuzha district, Kerala. *Natl Med J India* 1999;12:99-103.
- [16]. Kumar RH, Khandare AL, Brahman GN, Venkiah K, Gal Reddy Ch, Sivakumar B. Assessment of current status of fluorosis in northwestern districts of Tamil Nadu using community index for dental fluorosis. *J Hum Ecol* 2007;21:27-32.
- [17]. Outbreak of fluorosis rocks Tamil Nadu districts. [Last accessed on 2006 Nov 20]. Available from: [http://www.pharmabiz.com/article/details/news.asp? SecArch = s and articleid = 3874 and sectionid = 6.](http://www.pharmabiz.com/article/details/news.asp?SecArch=s&articleid=3874&sectionid=6)

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