



INCIDENCE OF DENTAL FLOUROSIS AMONG THE PATIENTS VISITING OUR INSTITUTE – A PROSPECTIVE STUDY

Dr. Anand Mangalgi	Reader, Department Of Oral And Maxillofacial Surgery, HKES'S S.NIJALINGAPPA Institute of dental sciences and research, Gulbarga
Dr. Kundan Shah*	MDS (ORAL AND MAXILLOFACIAL SURGERY) *Corresponding Author
Dr. Viquar Ahmed	Assistant professor, KBN medical college, Gulbarga
Dr. Neelam singh	PG student, Department of Oral and maxillofacial surgery, HKES'S S.NIJALINGAPPA Institute Of Dental Sciences And Research, Gulbarga
Dr. Swati Devani	Reader, Department of Prosthodontics, HKES'S S.NIJALINGAPPA Institute Of Dental Sciences And Research, Gulbarga
Dr. Subhash Gowda	Reader, Department of Community Dentistry. HKES'S S NIJALINGAPPA Institute Of Dental Sciences And Research, Gulbarga

ABSTRACT

This prospective study was carried out to find out the incidence of dental fluorosis among the patients visiting our institute during the months of January 2017 to December 2017. Total 3047 patients were seen in our department. Patients presented clinical dental fluorosis were separated and classified according to Dean's Index of scoring dental fluorosis. The incidence of dental fluorosis was 9.68 % (295 patients, 162 males and 133 females) being higher in males than in females. 64 (21.69%) showed very mild, 51(17.28 %) showed mild, 107(36.27 %) showed moderate, and 73 (24.74%) showed severe dental fluorosis. Main aim of our study was to highlight the effects of high fluoride levels in drinking water in these areas and bring the attention of educated community and responsible authorities towards serious health issue.

KEYWORDS : Dental fluorosis, incidence, dean's index

Introduction

In India, provision of safe drinking water is mandatory.[1] Thirty percent of urban and about 90% of rural population is dependent on untreated water source, of which 80% is ground water.[1] The most important source of these fluoride contaminants is from the soil.[2] Fluoride is a double-edged sword. Fluoride intake at optimal required level decreases the incidence of dental caries and is also necessary for maintaining the integrity of oral tissues. But at the same time when consumed in excess amount during developmental stages can cause adverse effects such as dental and skeletal fluorosis.[3] Dental fluorosis is a disturbance in tooth formation caused by excessive intake of fluoride during the formative period of the dentition. The degree of severity of the clinical manifestations of this form of chronic fluoride intoxication depends on the amount, form and frequency of fluoride ingestion, the duration of exposure, the age of the person, the bioavailability of the fluoride compound and possibly other yet unknown factors.[4] The aim of this study is to know the incidence of dental fluorosis and to highlight the effects of high fluoride levels in drinking water in these areas and bring the attention of educated community and responsible authorities towards serious health issue.

PATIENTS AND METHOD

This study was carried at our institution in India. Total 3047 (males = 1546 and females = 1501) patients were seen during January 2017 and December 2017. Patients presenting dental fluorosis were separated and Oral examination was carried out by two dentists on the dental chair using mirror and CPITN probe in natural light. Patients were seen by two dentists and both agreed on patient's clinical score of dental fluorosis as described by Dean's, 5 and applied by Khan AA.6 Teeth were examined wet and a CPITN probe was used to remove food debris or exclude any plaque or calculus and confirm fluorosis as suggested by Khan AA and others.7,8

The examiners stood in front of the patient to inspect the teeth along a horizontal plane, noted the distribution pattern of any defects and decided if they were typical of fluorosis. Dean's index was scored on the condition of the two most severely affected

teeth.6

In his studies, Dean¹³ suggested a category of questionable fluorosis in borderline areas, when comparing two large groups. However, this entity is considered a misnomer in Dean's classification system. 5 Therefore in the present study, patients having questionable fluorosis were considered as having no fluorosis.9,10 Special hygiene instructions were given and many patients were treated with composite restorations on labial surface of anterior teeth and crowning was advised to improve aesthetic concerns.

RESULTS

Study group consisted of 3047 patients (males = 1546 and females = 1501). Patients presenting dental fluorosis were 295 (9.68 %). It included 162 males and 133 females.

Graph 1: Shows incidence of dental fluorosis among the patients seen in our department. Fluorosis incidence was 9.68%. Sex wise comparison revealed that fluorosis incidence was higher in males (54.9%) than in females(45.1%).

Graph 2: Shows incidence of dental fluorosis according to clinical severity based on dean's classification. Fluorosis score was 64 (21.69%) very mild, 51(17.28%) mild, 107(36.27%) moderate, and 73 (24.74%) was severe

Graph 3: Shows the dental fluorosis among various age groups of patients visiting dental department. Among these, 6 (2%) were 0-10 years, 65 (22%) were 11- 20 years, 121 (41%) were 21-30 years, 82 (28%) were 31-40 years and 21 (7%) were above 40 years of age.

Discussion

This study was to estimate the incidence of dental fluorosis among patients visiting our institution. The recognition of the protective role of fluoride in drinking water against dental caries is considered as one of the major public health advances of this century.[11]

It is also recognized, that fluoride levels in excess of those that provide most of the protection against dental caries can lead to dental mottling. It is a paradox that mottled enamel (dental fluorosis) was associated with the presence of fluoride in drinking water long before its relationship with lower caries prevalence was noted.[12]

World Health Organization (WHO) has set the upper limit of fluoride concentration in drinking water at 1.5 mg/L.[13]

However, in 1984 WHO suggested that in areas with a warm climate the optimal fluoride concentration in drinking water should remain below 1 mg/L while in cooler climates, it could go up to 1.2 mg/L.[14] Therefore, the Bureau of Indian Standards has laid down Indian standards as 1.0 mg/L as the maximum permissible limit of water fluoride concentration with further remarks as "lesser the better." [15] In the early 1930s, fluorosis was reported only in four states of India; however, in 2007, it has spread to over 20 states including Karnataka and 66.62 million people are at risk, indicating that endemic fluorosis has emerged as one of the most alarming health problems of the country.[16]

Histologically, enamel fluorosis is defined as the presence of a hypomineralized subsurface zone, lying beneath a well-mineralized enamel surface layer.[17] Clear evidence indicates that the prevalence of enamel fluorosis has increased in both fluoridated and nonfluoridated areas since Dean's time.[18] In the past years, ingestible fluoride has become available from an array of intentional and unintentional sources, including fluoride supplements or vitamins, toothpastes and other fluoride-containing, topically applied preparations and beverages manufactured in fluoridated areas. [19] These additional sources provide unpredictable and perhaps high sources of additional fluoride to the overall diet. [18]

The prevalence of dental fluorosis in the United States has increased during the last 30-50 yrs years, both in communities with fluoridated water and in communities with nonfluoridated water.[20-22]

The present study was carried out to see the incidence of dental fluorosis among the patients visiting our institution.

The incidence of dental fluorosis was 9.68 % (295 patients, 162 males and 133 females) being higher in males than in females. 64 and it was closer to the findings seen by Khan 6.

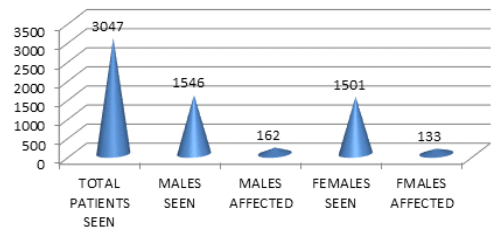
Fluorosis patients were classified according to clinical severity using Dean's Index of scoring dental Fluorosis which was 64 (21.69%) very mild, 51(17.28 %) mild, 107(36.27 %) moderate, and 73 (24.74%) was severe. The dental fluorosis among various age groups of patients visiting dental department. Among these, 6 (2%) were 0-10years, 65 (22%) were 11- 20years, 121 (41%) were 21-30 years, 82 (28%) were 31- 40 years and 21 (7%) were above 40 years of age. It was closer to the findings by (CDC). [23] This indicates that people of 10-40 years age group are more affected by dental fluorosis as found by (CDC). [24] and also they are more concerned about their teeth and getting awareness to visit the dentist to improve their esthetics and get possible available treatment.

CONCLUSION

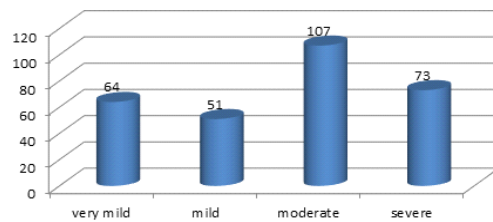
Continued research, therefore, should monitor the Incidence and severity of enamel fluorosis in the populations, and investigate further the causes of fluorosis. Since there are many possible sources of ingested fluoride, studies that look simultaneously at the effects of these multiple sources are needed. Our findings showed that the risk of dental fluorosis was significantly higher in the areas showing more fluoride content in drinking water. This study can act as a pointer to public health physicians, dentists, administrators, planners, and water supply authorities. The information furnished can be utilized as preliminary data, and a well-designed epidemiological investigation can be undertaken at village level and district level to confirm and assess dental fluorosis and to evaluate the risk factors associated with the condition in our area. It

is recommended to reduce the fluoride content of drinking water in the high fluoride area by making either alternative water source available or providing water with reduced fluoride content.

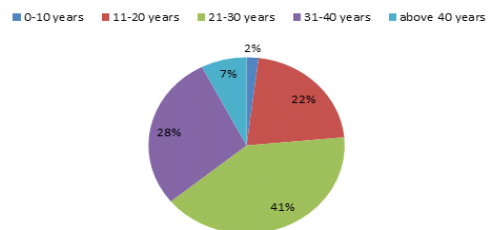
Graph 1 : Shows incidence of dental fluorosis



Graph 2 : Shows severity of dental Fluorosis clinically



Graph 3 : Shows incidence of dental fluorosis among various age groups



References

- Srikanth R. Challenges of sustainable water quality management in rural India. *Curr Sci* 2009;97:317-25.
- Iyer K, Panchmal GS, Shenoy RP. Defluoridation techniques implemented by the government of Karnataka, India – The current situation. *Community Dent Health* 2013;30:127-8
- Changing patterns of oral health and implications for oral health manpower: Part I. Report of a working group convened jointly by the Fédération Dentaire Internationale and the World Health Organisation. *Int Dent J* 1985;35:235-51.
- DenBesten PK. Biological mechanisms of dental fluorosis relevant to the use of fluoride supplements. *Community Dent Oral Epidemiol* 1999;27:41-7.
- Khan AA, Whelton H, O'Mullane D. A map of natural fluoride in drinking water in Pakistan. *Int Dent J*. 2002;52:291-97
- Dean HT. Classification of mottled enamel diagnosis. *J Am Dent Assoc*. 1934; 21: 1421-26
- Khan AA , Whelton H, O'Mullane D. Determining the optimal concentration of fluoride in drinking water in Pakistan. *Community Dentistry And Oral Epidemiology*. 2004;32(3): 166-172
- Khan AA. Fluoride levels in drinking water of Pakistan. *Pak J Med Res*. 2000; 39:52-60.
- Horowitz HS, Driscoll WS, Meyers RJ, Heifetz SB, Kingman A. A new method for assessing the prevalence of dental fluorosis – the tooth surface index for fluorosis. *J Am Dent Assoc*. 1984; 109: 37-40
- Horowitz HS. Commentary on and recommendations for proper uses of fluoride. *J Public Health Dent*. 1995;55:57-62.
- Butler WJ, Segreto V, Collins E. Prevalence of dental mottling in school-aged lifetime residents of 16 Texas communities. *Am J Public Health* 1985;75:1408-12.
- Bowen WH. Fluorosis: Is it really a problem? *J Am Dent Assoc* 2002;133:1405-7.
- World Health Organization. Guidelines for Drinking Water Quality. Geneva: WHO; 2004
- Renuka P, Pushpanjali K. Review on defluoridation techniques of water. *Int J Eng Sci* 2013;2:86-94.
- Government of India. Prevention and Control of Fluorosis in India. New Delhi: Rajiv Gandhi National Drinking Water Mission; 1993.
- Government of Karnataka. Baseline Report of Sachetana Drinking Water Project. Karnataka, India: Rural Development and Panchayath Raj, BAIF Institute for Rural Development; 2006.
- Fejerskov O, Thystrup A, Larsen LJ. Clinical and structural features and possible

- pathogenic mechanisms of dental fluorosis. *Scand J Dent Res.* 1977; 85:510–34.
18. Pendrys DG, Stamm JW. Relationship of total fluoride intake to beneficial effects and enamel fluorosis. *J Dent Res (Special Issue).* 1990; 69: 529–38.
 19. Clovis J, Hargreaves JA. Fluoride intake from beverage consumption. *Community Dent Oral Epidemiol.* 1988; 16: 11–15
 20. Fomon SJ, Ekstrand J, Ziegler EE. Fluoride intake and prevalence of dental fluorosis: trends in fluoride intake with special attention to infants. *Journal of Public Health Dentistry.* 2000; 60: 131–39.
 21. Warren JJ, Levy SM. Current and future role of fluoride in nutrition. *Dental Clinics of North America.* 2003; 47: 225–43
 22. Locker D. Benefits and Risks of Water Fluoridation. An Update of the 1996 Federal-Provincial Sub-committee Report. Prepared for Ontario Ministry of Health and Long Term Care. 1999
 23. Centers for Disease Control and Prevention (CDC). Surveillance for dental caries, dental sealants, tooth retention, edentulism, and enamel fluorosis—United States, 1988–1994 and 1999–2002. *Morbidity and Mortality Weekly Report Surveillancen Summaries.* 2005; 54: 1–43
 24. Centers for Disease Control and Prevention, (CDC, USA) Release of fluorosis data at International Association of Dental Research (IADR). March 2007