AGE AND GENDER PREDILECTION OF DENTAL FLUOROSIS AMONG AN OUTPATIENT POPULATION VISITING A DENTAL COLLEGE

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Abstract

Introduction

Dental fluorosis is the developmental disturbance of enamel that results from ingestion of high amounts of fluoride during tooth mineralization. Drinking water remains the main source of fluoride. Other sources of fluoride are infant formula, vegetables ,canned fish,sea foods,improper utilisation of fluoride toothpaste in children.

Aim

The aim of this study is to assess the age and gender prediction of dental fluorosis among an outpatient population visiting a dental college.

Materials and methods

This is a cross sectional retrospective study with an analytical component.Data of 562 dental fluorosis patients were analysed between March 2019 and March 2020.The data was tabulated in excel and reviewed and was classified according to dean's fluorosis index, following which, data was imported to SPSS software by IBM, for descriptive statistical analysis and the statistical test used in this study is chi-square test.

Results

In this study, we found that there is a high incidence of dental fluorosis in the age group of 20 to 30 years. There is a higher incidence of dental fluorosis in males than in females. Prevalence of dental fluorosis in the younger group and in males is very high.

Keywords: Age predilection, bioavailability,fluorosis,fluoride,gender predilection

INTRODUCTION

Fluoride is an essential element, beneficial for the development of bone and teeth[1].World Health Organisation and Indian Council of Medical Research described the drinking water quality guideline value for fluoride is 1.5 milligram per litre. intake of large quantities of fluoride through drinking water than the optimal safe level is the primary reason for prevalence of dental fluorosis in various parts of the world. Fluorosis is a slow progressive, crippling disease, which affects every organ in the body and results in health complaints along with overlapping manifestations with several other diseases[2]. Dental fluorosis is characterized by lustreless, opaque white patches in the enamel, which may become stained yellow to dark brown, and in more severe cases causes marked pitting and brittleness of teeth.[3] Dental fluorosis is seen as sensitive to even small changes in fluoride exposure from drinking water[4,5], and this sensitivity is greater at young age than at an older age. Fluoride is present in water and has almost completely dissociated fluoride ions from the parent compounds occurring in the natural or in the form of added salts. bioavailability of soluble fluoride [6] is largely controlled by acidity in the stomach. Thus, the stomach fluoride absorption from water through the gastrointestinal tract into the bloodstream is nearly 100% by the process of simple diffusion.[5] Hence, water fluoride level is the primary reason for the cause of fluorosis.[6] Many of the previous studies, from various parts of the world, reported that the development of dental fluorosis even if the people consuming drinking water with fluoride less than 1 milligram per litre, which implies that the optimal fluoride dose level in drinking order may vary with various features like local climatic conditions, methods of food processing and cooking, amount of food and water intake and its fluoride and other nutrients level and dietary habits of the community as a whole.[7] The prevalence of dental fluorosis in man is reported from 22 states of India, affecting more than 40 million people[8]. The global prevalence of dental fluorosis is reported to be above 32%. to find out the age and gender prediction of dental fluorosis is an outpatient population of a Dental College[9].

Dental fluorosis is the hypomineralization of tooth enamel resulting from chronic, excessive ingestion of fluoride during tooth development, particularly during the pre-eruptive enamel maturation period[10]. Dental fluorosis of primary teeth is uncommon as primary tooth development occurs predominantly in IntraUterine Life; however, if dental fluorosis does occur in primary teeth, it is most commonly observed in the gingival third of the second primary molars. The development of the anterior permanent tooth bud, in general, begins at approximately 5th month IUL. Therefore, this is a critical time to avoid excess fluoride exposure for the aesthetic appearance of the anterior teeth[11].The degree of dental fluorosis severity is dose dependent. Mild dental fluorosis generally appears as barely visible opacities at the incisal or cuspal edges of teeth; [12]it can also appear as white striations or lacy markings following the enamel perikymata.[13] Severe dental fluorosis can have a heavily stained, pitted, friable enamel appearance.[14]Generally, the opacities associated with fluoride exposure are symmetrical on contralateral teeth, although post-eruptive staining and attrition of friable enamel associated with severe fluorosis can result in dissimilar appearances of contralateral teeth[15].

In an analysis of national data from 1986-1987 and 1999-2002, there was a nearly 10% increase in dental fluorosis prevalence in participants, aged 6 to 10 years, from 22.8% to 32.2%.Increasing amounts of available information regarding factors contributing to dental fluorosis and changes in personal behaviors, has led to periodic revisions of the recommendations for fluoride supplementation. The American Dental Association lowered the fluoride supplement schedule in 1994 and the American Academy of Pediatrics endorsed the change shortly thereafter.[15,16]

MATERIALS AND METHODS

The present study is a cross sectional, retrospective study which has been done in a university setting. Advantages of University setting are easy retrieval of records, the available data is from the same ethnicity.the disadvantages are that the study is confined to one geographical location, less number of sample size and same ethnicity. After getting the necessary approval of the ethical committee of the Institute Review Board, data of 162 patients with dental fluorosis was analysed between March 2019 and March 2020. data was tabulated in excel and was then imported to SPSS software by IBM, for descriptive statistical analysis. The variables were defined in the SPSS and the statistical test used was the chi-square test. The type of analysis done is correlation and Association by descriptive data analysis.

RESULTS

In this study we saw that there is a higher incidence of dental fluorosis in the age group of 18 to 25 years.Males have a higher predilection for dental fluorosis than females.Mild form of dental fluorosis is most prevalent among other grades.Severe form of dental fluorosis is seen more in males compared to females. In both genders, the younger age that is 18 to 25 years, is more prone to dental fluorosis compared to elderly group that is above 40 years(fig.1 & fig.2).However, there is no statistical association between age and the different grades of dental fluorosis and also between gender and the different grade of dental fluorosis.

DISCUSSIONS

Findings of this study reveal an increase in the prevalence of very mild dental fluorosis.There was a lack of national contemporary literature concerning dental fluorosis trends in india with which to compare this study.[17] However, in a review conducted in 1999, dental fluorosis was clearly increasing in communities with community water system (CWS) fluoride levels below 0.3 parts per million and there were indications of a similar trend with optimal CWS fluoride levels. Researchers of a study conducted in 2003-2004 with North Carolina school children from kindergarten to high school seniors indicated that 71.8% of the children had no fluorosis, 24.4% had questionable to very mild fluorosis, and 3.7% had mild, moderate, or severe fluorosis using the Dean's classification system.[17,18]

The 2001-2002 data for normal/questionable prevalence (70.3%) from the current study supports the findings of the North Carolina study. [19–21]there is a slight Male prediction of dental fluorosis than females.males being 72% and females being 40%.Mild dental fluorosis is more prevalent in males, where moderate dental fluorosis in females.Severe form of dental fluorosis is seen more in males compared to females. In both genders, the younger age that is 20 to 30 years, is more prone to dental fluorosis compared to elderly group that is above 40 years.[22,16,13] There is a peak of incidence of dental fluorosis in 20 to 24 years in males and 22- 26 years in females. This result of the study has been supported by Apurva K Srivastava, et al who stated that prevalence of dental fluorosis is more in young age.Abid Mohsin,et al(2014) in their study observed that males have high prevalence of dental fluorosis compared to females.Dental fluorosis is a not only a cosmetic problem that impairs social well-being but also affects the oral health-related quality of life.[23,24,26] The maintenance of oral health requires an informed public as well as self-awareness of the disease to motivate the sufferer into playing a role in the prevention and control of the disease through self-care and professional assistance.

The government also has a key role to play in control of fluorosis. Dentists, as well as public health dentists, are at the center of this problem. Dentists, who come across fluorosis patients in their routine clinical practices, can educate and motivate these people to adapt to practices regarding safe drinking water[10]. Due to the high cost of the treatment, most of the people in developing countries cannot afford the treatment cost, thus are reluctant to seek the treatment. No contradictory Literature findings is observed.overall consensus agree with the finding of this current study.limitations of the study is limited to a small population, small sample size and same ethnicity and the future scope of this study- studying a larger population and further measures to be taken are patients from different geographical locations and different ethnicity.[25]

CONCLUSION

Our study results revealed that pertaining to our study population,dental fluorosis is mostly seen in younger age, than elderly age and that there is a male prediction for dental fluorosis compared to females. This brings home the fact that the family dentist has a very important role to play in identifying mild dental fluorosis at the earlier stage, educating the individual, the family concerned and evaluating their community water fluoridation status or other factors; because prolonged ingestion of fluorides through drinking water in excess of the daily requirement is associated with dental (1–2 ppm F/l) and skeletal fluorosis (2–6 ppm F/l) and inadequate intake with dental caries.

ACKNOWLEDGEMENT

CONFLICT OF INTEREST

None to declare.

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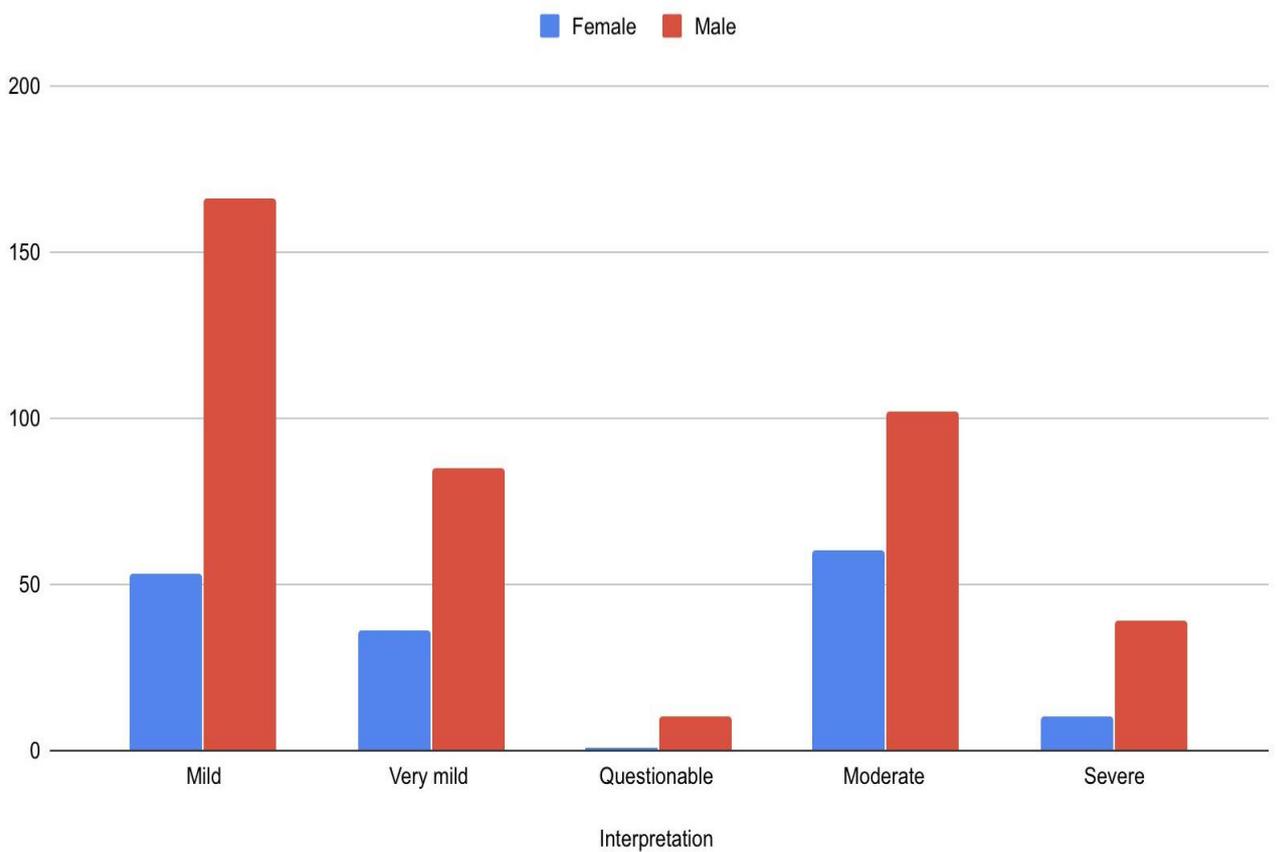
Distribution of types of dental fluorosis among gender

Figure I: Bar graph depicting the association between the gender of the patients and dental fluorosis.X axis represents the different grades of dental fluorosis according to Dean's fluorosis Index and the Y axis represents the gender of patients represented as blue colour (female) and red color(male). Males experienced more dental fluorosis than females, however this difference is not statistically significant. Chi-square test, p value:0.22 (p value>0.05 which is not statistically significant)
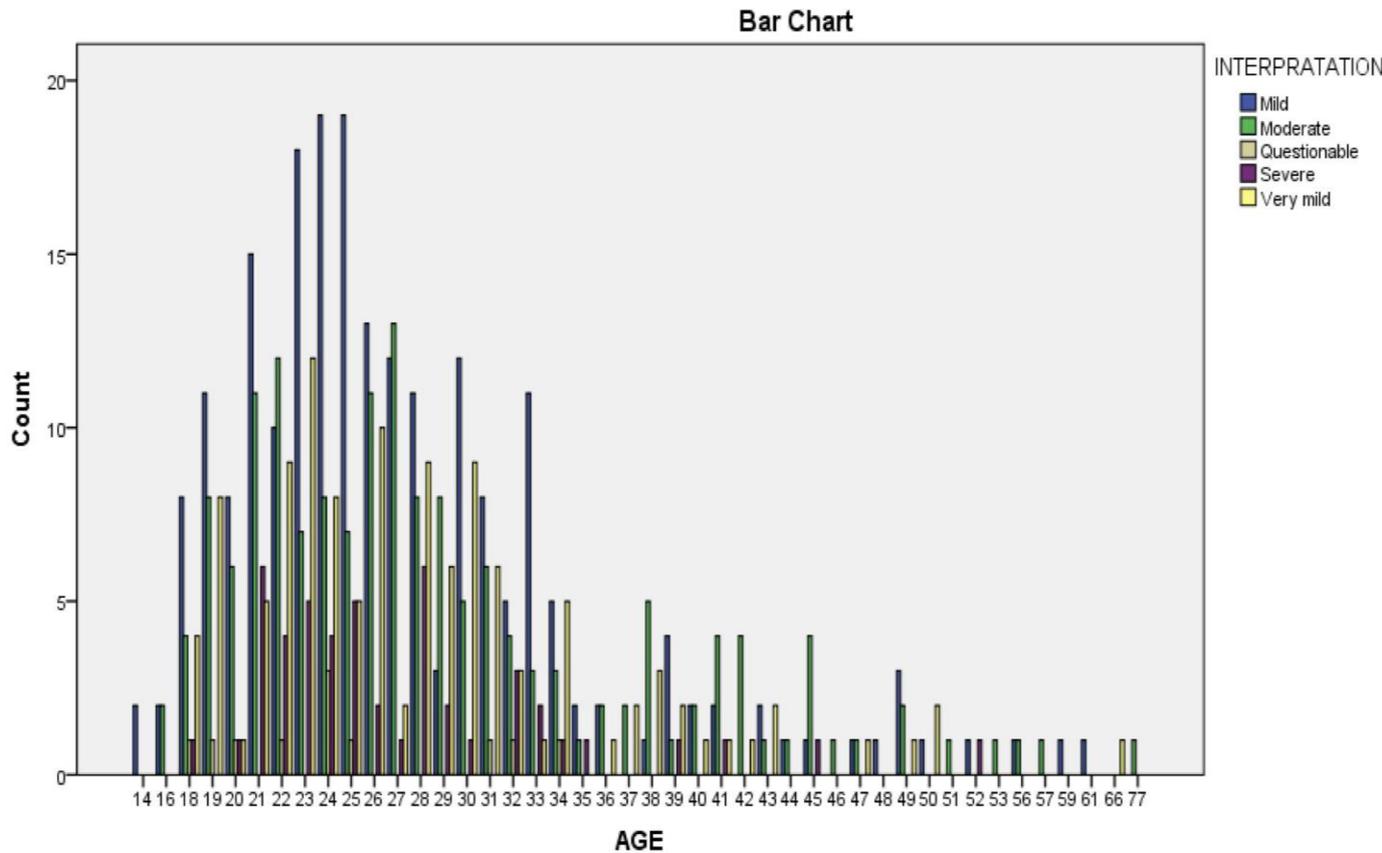
Figure II: Bar graph depicting the association between the age of the patients and dental fluorosis.X axis represents the age of patient and the Y axis represents the grade of dental fluorosis according to dean's fluorosis index where blue colour denotes mild, green colour denotes moderate, brown colour denotes questionable, violet colour denotes severe and yellow colour denotes very mild form of dental fluorosis. There is an increase in incidence of dental fluorosis in the young age (18-25 years) more than older age, however this difference is not statistically significant. Chi-square test, p value:0.995 (p value>0.05 which is not statistically significant)