

# DENTAL FLUOROSIS AMONG PATIENTS VISITING A DENTAL HOSPITAL IN CHENNAI.

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## ABSTRACT

Dental fluorosis is a sign of prolonged high fluoride exposure. The aim of the study is to assess the severity of dental fluorosis among the patients visiting a Dental College in Chennai, Tamilnadu. A retrospective institution based study was conducted by evaluating and analysing 291 patient case records visiting a dental hospital from December(2019) to March(2020) who had signs of dental fluorosis. Data such as age, gender, type of dental fluorosis were documented from the online database of saveetha dental college - DIAS Dental Information Archiving Software. Ethical approval was obtained by the institutional ethical board at Saveetha University. The data was examined by two examiners. The data collected was reviewed and subjected to statistical analysis using IBM SPSS software version 20.0. The present study shows Females and middle aged patients with dental fluorosis visit dental hospitals more frequently.

**KEYWORDS** : Dental, Fluoride, Fluorosis, Patients, Severity.

## INTRODUCTION

Dental Fluorosis is a sensitive sign of prolonged high fluoride exposure (Shekar et al., 2013). There are about 90 different causes of marking on the enamel surface of teeth. One such defect is fluorosis (Prabakar, John and Srisakthi, 2016). Dental fluorosis occurs among people who are staying in a place where there is more fluoride content in groundwater. Dental fluorosis is endemic in at least 25 countries. There will be a rapid increase in the severity of fluorosis if it is untreated.

Dental Fluorosis is a global epidemic problem(Prabhakar, Murthy and Sugandhan, 2011). The occurrence of dental caries depends upon the level of fluoride in which people consume. It also depends on the location of the people consuming it (Kumar, Pradeep Kumar and Vijayalakshmi, 2017). The severe type of fluorosis was seen mostly on the incisors and premolars. Dental fluorosis is evident when a child has consumed an excessive amount of fluoride during the enamel's development (Prabakar, John, Arumugham, Kumar and Srisakthi, 2018) (Kannan et al., 2017). The prevalence of primary fluorosis is less than that of the permanent fluorosis (Samuel, Acharya and Rao, 2020). Dental fluorosis affects the tooth and changes colour from brown to black leading to dental caries(Mathew et al., 2020). Fluoride is an element found in drinking water. It has the ability to make the tooth resistant to dental caries(Prabakar, John, Arumugham, Kumar and Sakthi, 2018). Fluoridation of water is a basic procedure (Jothimani and Pandian, 2017). It ensures the presence of a precise amount of fluoride content in the drinking water so as to provide systemic and local benefits for the human beings (Harini and Leelavathi, 2019).

The white opaque appearance of fluorosed enamel is caused by a hypomineralized enamel subsurface. In more severe dental fluorosis, pitting and a loss of the enamel surface occurs (Khatri et al., 2019); (Pavithra, Preethi Pavithra and Jayashri, 2019). It leads to the secondary staining (brown colour). Many of the changes caused by fluoride are related to cell/matrix interactions as the teeth are forming. At the early maturation stage, the relative quantity of amelogenin protein is increased in fluorosed enamel in a dose-related manner (Neralla et al., 2019). This appears to result from a delay in the removal of amelogenins as the enamel matures (Mohapatra et al., 2019) In vitro, when fluoride is incorporated into the mineral, more protein binds to the forming mineral, and protein removal by proteinases is delayed. This suggests that altered protein/mineral interactions are in part responsible for retention of amelogenins and the resultant hypomineralization that occurs in fluorosed enamel (Pratha, Ashwatha Pratha and Prabakar, 2019) Fluoride also appears to enhance mineral precipitation in forming teeth, resulting in hypermineralized bands of enamel, which are then followed by hypomineralized bands S (Chandu et al., 2009).

Since the predominant cariostatic effect of fluoride is not due to its uptake by the enamel during tooth development, it is possible to obtain extensive caries reduction without a concomitant risk of dental fluorosis (Pramanik and Saha, 2017). Further efforts and research are needed to settle the currently uncertain issues, like the incidence, prevalence, and causes of dental or skeletal fluorosis in relation to all sources of fluoride and the appropriate dose levels and timing of fluoride exposure for prevention and control of dental fluorosis and caries (Franzolin et al., 2010). This present study was done to estimate the severity and type of dental fluorosis among the patients visiting a dental hospital in Chennai, Tamilnadu.

## **MATERIALS AND METHODS**

A retrospective institution based study was conducted by evaluating and analysing 291 patient case records visiting a dental hospital from December(2019) to March(2020) who had signs of dental fluorosis. Data such as age, gender, type of dental fluorosis were documented from the online database of Saveetha Dental College - DIAS Dental Information Archiving Software. Ethical approval was obtained by the institutional ethical board at Saveetha University. The data was examined by two examiners. The data collected was reviewed and subjected to statistical analysis using IBM SPSS software version 20.0.

## **RESULTS AND DISCUSSION**

Around 291 Dental fluorosis patient records were reviewed. The patients were grouped into 4 different age groups (Figure 1). The age groups and number of people under each category are 15 - 25 years with 14.78% of patients, 26 - 35 years with 62.54% of the patient, 36 - 45 years with 17.53% of the patient and 46 - 55 years with 5.155% of the patient with dental fluorosis. Out of total 291 patients, 30.93.7% were males and 69.07% were females(Figure 2). The results were similar to a study done by (Joshi, Joshi and Bajaj, 2018).

Figure 3 shows the type of fluorosis among the study population. It was found that 32.65% of the study population had questionable fluorosis, very mild fluorosis (26.46%), mild fluorosis(13.06%), moderate fluorosis (14.43% ) and Severe fluorosis (13.40%). Figure 4 depicts the age wise distribution of patients with dental fluorosis. In the present study it shows that among 15 - 25years, 5.15% (15) showed Questionable fluorosis. It is a similar study done by (Arya, Gazal and Raina, 2013). 26 - 35years, old patients visited dental hospitals frequently compared to other age groups. Similar study was done by (Siddiq et al., 2011). Figure 5 shows questionable fluorosis seems to be higher among females compared to males, which is similar to study done by (Arya.S Arya, Gazal and Raina, 2013). It was also found that mild fluorosis was more among females than males. Which is similar to study by Siddiq (Siddiq et al., 2011) . Also mild fluorosis was relatively more among females. It is Similar to study done by (Arya, Gazal and Raina, 2013). Similarly moderate fluorosis was high compared to males, similar results were found by (Panicker et al., 2019) and (Asawa, 2015). Severe form of fluorosis was observed among 5.15% of the males and 8.25% of the females , the finding is in contrast to the study by (Riordan, 1993).

The present study shows that females and middle aged patients with dental fluorosis , who frequently visited the dental hospital could be due to aesthetic concerns.

## CONCLUSION

The present study concluded that females and middle age patients with dental fluorosis visit dental hospitals more frequently. This study is further recommended to document the geographic location and source of drinking water for further planning to identify unexplored areas of fluorosis.

**Author contributions:** All authors contributed to the design and implementation of the research, analysis of the results and to the writing of the manuscript.

**Conflicts of interest:** There are no conflicts of interest.

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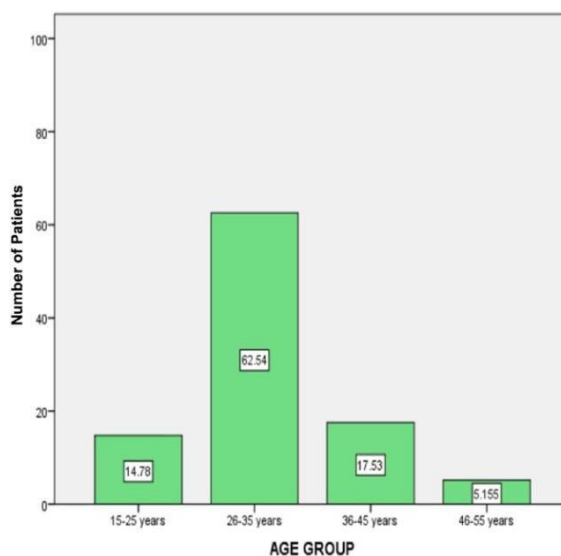


Figure 1 shows the age wise distributions of patients with Dental Fluorosis. X axis represents the age groups and the Y axis represents the percentage of patients under each age group who are with Dental Fluorosis. It is found that more than half of the study population belong to the 26-35 years (62.54%) and 5.1 % belong to 46-55 years.

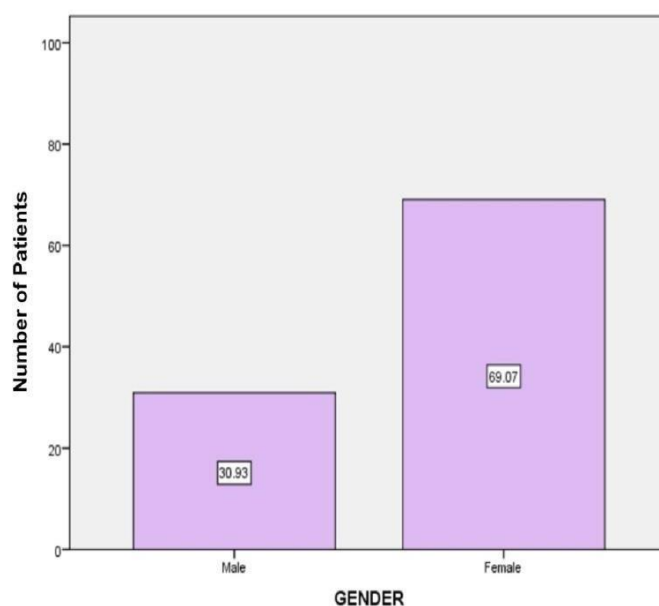


Figure 2 shows the gender wise distribution of patients with Dental Fluorosis. X axis represents the gender and the Y axis represents the percentage of patients who are males and females. It is found that more than half of the study population were females(69.07%) than males (30.93%).

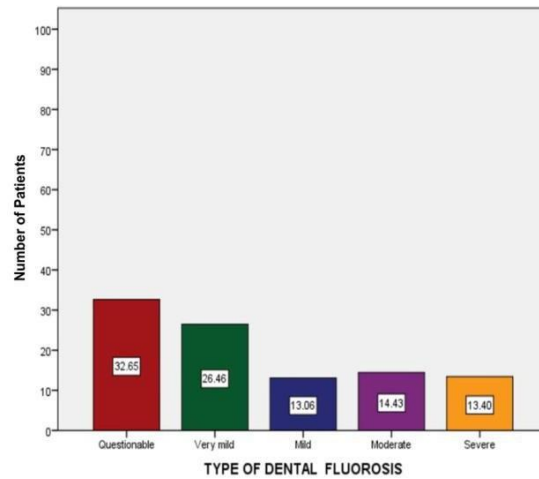


Figure 3 shows the percentage distribution of types of dental fluorosis. X axis represents the types of Dental fluorosis and the Y axis represents the percentage of patients under each category of dental fluorosis. 32.6%(red) exhibited questionable, 26.4%(green) showed very mild, 13.06%(blue) exhibited mild, 14.4% (violet) showed moderate and 13.4%(orange) exhibited severe forms of dental fluorosis.

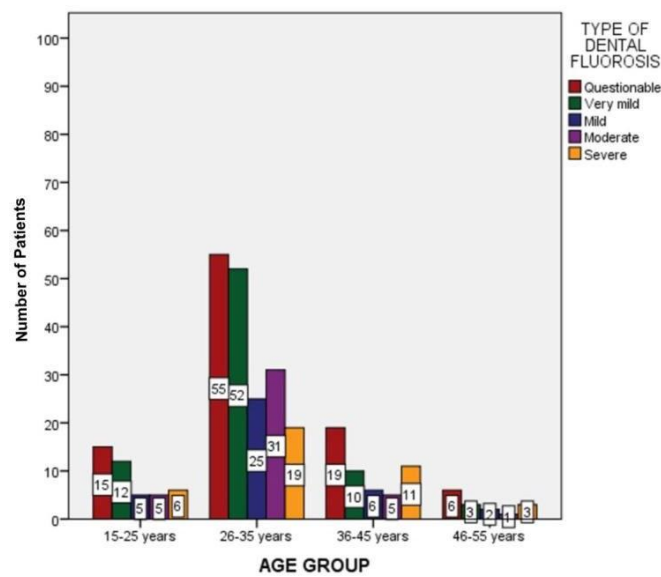


Figure 4 depicts the Age wise distribution of patients with dental fluorosis visiting a dental hospital. X axis represents the age group and the Y axis represents the number of patients with dental fluorosis. Among all the age groups Questionable fluorosis (red) was found to be higher. The association between age and type of dental fluorosis was found to be statistically not significant. p value of 0.673,  $p > 0.05$  (Chi square test).

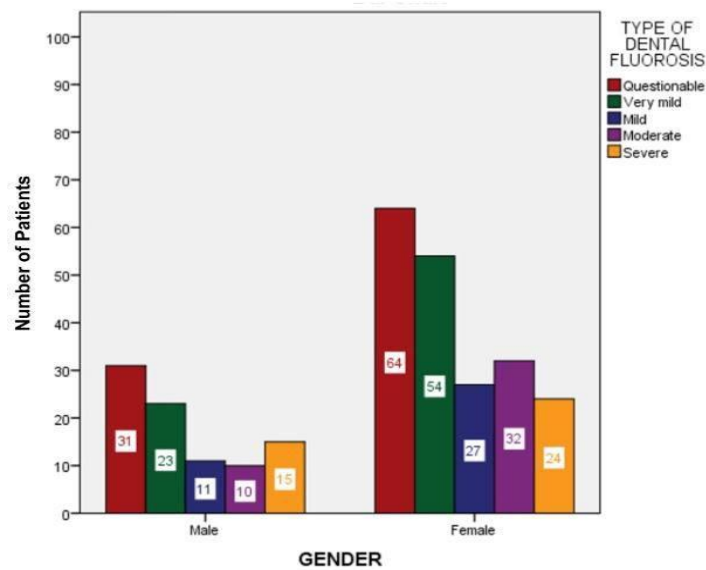


Figure 5 depicts Gender wise distribution of patients with dental fluorosis visiting a dental hospital. X axis represents the gender and the Y axis represents the number of patients with dental fluorosis. It is found that females exhibit higher proportions in all types of dental fluorosis compared to males. Among both male and females questionable fluorosis was more common. Severe fluorosis was found higher in females compared to males. The association between gender and type of fluorosis was found to be statistically not significant p value of 0.686,  $p > 0.05$  (Chi square test).