



Awareness of Dental Fluorosis among Children – A Survey

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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 Chennai. 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, mostly from drinking water and to a certain extent from fluoride containing food items. A continuous level of 1.5 ppm per litre 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 1 to 4 years 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. 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.

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[1]. However, excessive intake of fluoride leads to dental and skeletal fluorosis. Its abundance in the continental crust is about 626 µg/g[2].

Fluorosis is caused by ingestion of excess fluoride mainly through drinking water contamination. Due to its strong electronegativity, 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[3].

The clinical appearance of dental fluorosis is characterized by lustreless 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[4]. Both the bleaching technique and abrasion procedures could be employed only for mild to moderate grade fluorosis. [4],[5]. 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[6].

Occurrence of fluoride in groundwater has drawn world-wide attention due to its considerable impact on human physiology[7]. 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 [8],[9]. Fluorosis is endemic in almost two-third states in India. Excess fluoride in groundwater is mainly the key factor[10].

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[11]. It is therefore not surprising that dental fluorosis is endemic in 17 states of India[12],[13].

In Tamil Nadu, fluorosis has been reported to be endemic in the districts of Dharmapuri, Erode, Salem, Coimbatore, Trichy, Madurai, Vellore and Virudhunagar[14],[15]. It is one of the Southern states having 10 out of the 29 districts affected with fluorosis.

The maximum tolerance limit of fluoride in drinking water specified by the World Health Organization (WHO, 1984) is 1.5 mg/l [16]. 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[17]. 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[12][13]. Dental fluorosis is endemic in 150,000 villages in India[14].

Teeth affected by fluorosis are not diseased. Fluorosis will

not result in cavities or other dental problems. Concerns about appearance can be addressed with whitening to remove surface stains and veneers or other procedures to cover the discolouration.

MATERIALS AND METHODS:

An online survey consisting of 16 questions was conducted among 100 participants aged 13 to 18 using the online questionnaire in survey-planet. The following questions were included:

- 1) What is your gender?
- 2) What do you use to brush your teeth?
- 3) How often do you brush your teeth?
- 4) How many glasses of water do you drink everyday?
- 5) What is your source of water?
- 6) Do you have the habit of drinking carbonated drinks?
- 7) Have you noticed any white spots or lines on your teeth?
- 8) Have you noticed any discolouration in your teeth?
- 9) Do you know that water contains fluoride?
- 10) Do you know that exposure to excess of fluoride causes fluorosis?
- 11) Are your parents aware of fluorosis?
- 12) Does any of your family members have history of fluorosis?
- 13) How often do you visit your dentist?
- 14) Do you think fluorosis can be treated?
- 15) If yes, how do you think it can be treated?
- 16) How do you consider fluorosis as a problem?

RESULTS :

The statistically analysed data are given below:

It is seen that among 100 participants, there were equal number of male and female participants. Figure 1 given above depicts the percentage of participants using ground water or any other source of water.

The figure 2 given above shows the percentage of people who have noticed any discolouration or white spots of their tooth.

The figure 3 depicts the percentage of people aware of dental fluorosis and figure 4 depicts the percentage of people who believe that fluorosis can be treated, figure 5 shows how the participants considered fluorosis as a problem and figure 6 shows the treatment options for fluorosis

Figure 1 - Source of drinking water

■ Municipal water ■ Ground water ■ Other sources

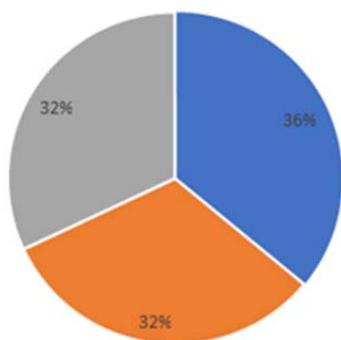


Figure 2 - noticed any discolourations or white spots

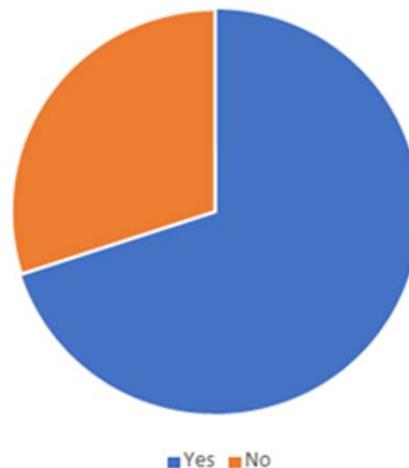


Figure 3- awareness of dental fluorosis

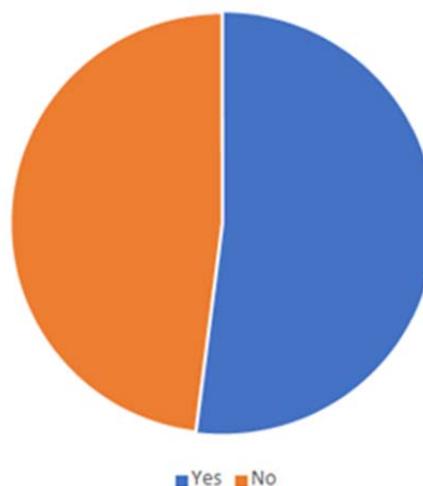


Figure 4- believe that fluorosis can be treated

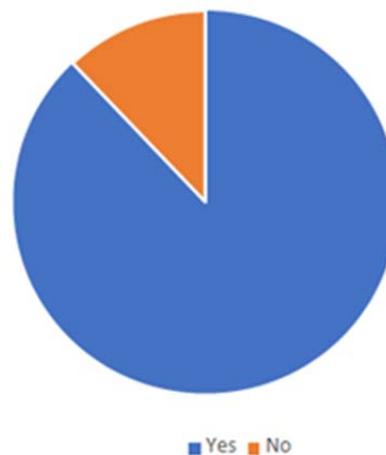


Figure 5- How is fluorosis considered a problem?

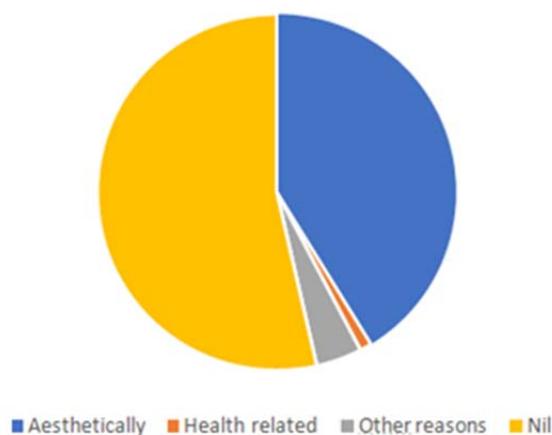
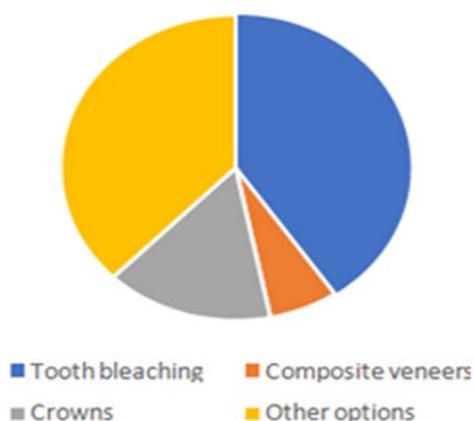


Figure 6 - how can fluorosis be treated?



DISCUSSION:

Fluorosis is a problem most prevalent in 24 countries of the world. Since India lies within the fluoride belt, about 4 million people are at risk of developing fluorosis. It is more prevalent among children since deciduous dentition are more likely to be affected by exposure to excess of fluoride.

From this study, it is seen that the people who used ground water were more likely to be affected by dental fluorosis and people drinking more than 6 glasses of water having ground water as the source are more likely to be affected. The majority of the participants were aware of the fact that water contains fluoride and have some knowledge about fluorosis. The participants of this survey, considered fluorosis as a problem which will affect their health and few. Few others considered it as an aesthetic problem and very few people have no idea.

Majority of the parents are aware of fluorosis and this plays a major role in spreading awareness among their children. In this study it is also seen that majority of participants believe that fluorosis can be treated and believed that it can be treated by tooth bleaching followed by composite veneers and crowns, where they considered tooth bleaching as an effective option.

Fluorosis starts as early as 8 years in children. Hence, the people must be educated about dental fluorosis so that this problem can be prevented

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