



# Dental Fluorosis

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### Abstract:

The earth contains fluoride naturally along with other minerals. Dental fluorosis is an enamel developmental disorder brought on by excessive fluoride consumption, increasing the porosity of enamel. It can be clinically observed as white lines or brown spots covering the enamel. Although this condition is not painful, the person who has dental fluorosis significantly affects the tooth's look, structure, and shape. It is unattractive and unpleasant. This article's goal is to discuss the clinical characteristics of dental fluorosis and how to treat it correctly.

Key words: fluorosis, brown spots, hypomineralization

### Introduction:

Fluorosis is a disease caused by deposition of fluorides in the hard and soft tissue of the body. Dental Fluorosis can be defined as a developmental condition of enamel caused due to excessive intake of fluoride which causes hypomineralization of enamel with increased porosity. Its clinical feature includes spots ranging from mild white line to opaque spots covering all part of enamel. The color may vary in white yellow or brown and can be accompanied by enamel loss (1). In India, drinking water is the most common way to consume fluoride; alternate sources include plants, which also absorb fluoride through water uptake. Fluoride is another occupational danger connected to the mining and smelting of metals, particularly aluminium, which can cause tooth discolouration and paralysis. Fluoride levels in surface water vary widely according to geographical location and proximity to emission sources but are generally low ranging from 0.01 To 1.5 mg/L (2). WHO in 1999 estimated in India, 20 states have been identified as endemic areas, with an estimated 60 million people at risk and 6 million people disabled; about 600,000 might develop a neurological disorder as a consequence. Rajasthan and Gujrat in North India and Andhra Pradesh in South India are worst affected (3).

According to World Health Organization standard rate of fluoride in drinking water is 0.5 to 1.0 ppm (2). Fluoride in water is used for the prevention of tooth decay to rebuilt and strengthen the tooth's surface or enamel it also prevents tooth decay. Fluoride is also a composition of toothpaste in which fluoride ranges from 1,350 To 1,500 ppm fluoride in adults while in children the maximum fluoride content is 1000ppm. Artificial water fluoridation can also be seen at various places to reduce the risk of caries development.

## Occurrence and origin-

Dental fluorosis is becoming more common in various parts of the world, including areas with fluoride-deficient public water supplies. This could be attributed to the increased use of fluoride in preventive dentistry. Exposure to apparently low fluoride concentrations in drinking water has resulted in severe dental fluorosis in some children in some countries. This emphasises the importance of considering all fluoride intake sources in a community before prescribing fluoride supplements or recommending an appropriate fluoride concentration for the public water supply (4).

## Etiology

The severity of dental fluorosis is dose dependent—the more fluoride consumed during tooth development, the more severe the fluorosis. However, the exact amount required to cause fluorosis is unknown and varies between individuals (5).

At the structural level, subsurface porosity of the enamel surface—which is actually identical to what is found in early dental caries lesions—is what defines dental fluorosis. It is thought that too much fluoride during enamel development disrupts mineralization and encourages enamel protein retention, resulting in weaker enamel structures and hence subsurface porosity. Although it is believed that excess fluoride can harm enamel at any stage of development, it seems that the early maturation stage is when fluoride sensitivity is highest (5).

When children are young, dental fluorosis develops during tooth formation. Drinking water containing more than 1.5 ppm (parts per million) fluoride can cause enamel defects and tooth discoloration, leading to endemic fluorosis in the population. These can range in severity from mild to severe (6).

Therefore, depending on the typical local temperature, the recommendations made by health organisations call for fluoride concentrations of between 0.7 and 1.2 mg (7).

## SIGNS AND SYMPTOMS

Fluorosis symptoms vary from minor white specks or streaks to dark brown stains and rough, pitted enamel that is difficult to clean. Teeth that are exempt of fluorosis are smooth and shiny. They should be a pale creamy white as well (8).

Table 1. Fluorosis index of H.T Dean 1942 (1)

Score	Criteria
Normal (0)	Normal teeth with a smooth, uniform natural coloured tooth surface.
Questionable (0.5)	Teeth that have some white flecks or spots.
Very Mild (1)	No more than 25% of the tooth is covered with small white opaque areas
Mild (2)	Less than 50% of the tooth affected with white opaque areas.
Moderate (3)	More than 50% of the tooth surface areas are affected and may be associated with brown staining.
Severe (4)	Teeth that are severely mottled or pitted and often have brown staining which affects 100% of the enamel surface of the tooth.

## Differential Diagnosis

There are several different possible diagnosis for dental fluorosis. Early carious lesions, molar-incisor hypomineralization, developmental diseases of enamel and dentine, such as amelogenesis imperfecta, Turner hypoplasia, tetracycline staining, and oral symptoms of celiac disease are among them, however they are not limited to them (9).

For the dentist to be able to distinguish between dental fluorosis and carious teeth, the patient should provide a positive history of fluoride intake (9).

## Prevention and Treatment

In most cases, dental fluorosis treatment is unnecessary.

De-fluoridation of drinking water in endemic areas, cautious use of fluoride supplements, and supervision of fluoride toothpaste use by children under the age of five are all preventive measures for dental fluorosis. Bleaching, micro-abrasion, veneering, or crowning can be used to treat aesthetically objectionable discoloration of effected teeth (4). Aesthetics are the main issue for the majority of people with dental fluorosis (10). Patients will need to maintain their restorations for the majority of their lives once they begin the restorative cycle (11).

For this reason, whenever possible, treatment approaches must be based on the principles of minimally invasive dentistry, especially where there are few symptoms and functional limitations (13). Patients must be thoroughly informed of the hazards before considering more aggressive therapy approaches for severe dental fluorosis (12).

Examples of such methods include tooth whitening and other methods to eliminate surface stains; take note that bleaching teeth may momentarily make fluorosis appear worse.

Bonding, in which a strong resin is applied to the tooth and forms a bond with the enamel. In cases of severe fluorosis, dentists may recommend crowns or veneers, which are crafted shells that cover the front of the teeth to improve their appearance. In order to lessen tooth discolouration, a calcium phosphate paste, is occasionally used in conjunction with techniques like microabrasion (8).

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