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Impact of fluoride in Bastar

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ABSTRACT

It is well known that the excess fluoride intake is responsible for dental and skeleton fluorosis. Villages of Bastar block and bakawand block are badly affected with fluoride. The reason is that a high concentration of fluoride water used by villagers for drinking and cooking purpose where groundwater is the major source of drinking water, water with fluoride content more than 1.5ppm may cause fluorosis. In the present study randomly selected primary and middle schools of Bastar and bakawand block, where the highest percentage of dental fluorosis was seen in 7 to 14 yrs age group children and in some places crippling lower limbs also noted. Since Bastar has a dense forest, heavy rainfall occurs during the monsoon season. There are no chemical factories in the district and nearby districts. Pollution free rainwater can be stored in cisterns and reservoirs by rainwater harvesting. This water can use to dilute the fluoride concentration and water level to be maintained.

Keywords— Fluoride

1. INTRODUCTION

Fluorine is one of the essential elements required for the normal mineralization of bone and formation of dental enamel (1) the main source of fluorine is drinking water and food such as sea fish, cheese and tea (2). The recommended level of fluoride in drinking water in India is 0.5-0.8mg/l (3). On the other hand, it is well known that excess fluoride intake is responsible for fluorosis.

Fluorosis is an important public health problem in 24 countries of the world. India lies in a geographical fluoride belt, which extends from turkey to China and japons Through Iraq, Iran and Afganistan of 85 million tons of fluoride contamination are widespread, intensive and alarming in India. Endemic Fluorosis is prevalent in India since 1937(5). In India 725 district 28 states and UT's with 66 million people are at risk.

In the state of Chhattisgarh Durg, Bastar, Kanker, Sarguja, Balod and Korba district are endemic for fluorosis(6). In India fluorosis is arising through drinking water fluoride contamination. It has been found that community living in rural/semi-urban areas are most severely affected as they are dependent on the ground water is drawn by hand pumps, tube wells, open well water for consumption. Water quality is seldom tested in rural areas because of the strong conviction that water drawn from the deepest crust of the earth has to be safe or pure.

World health organization has set the upper limit of fluoride concentration in drinking water at 1.5 mg/l (07). The Bureau of Indian standards, has, therefore, laid down Indian standards as 1.0 mg/l as the maximum permissible limit of the fluoride with further remarks as "lesser the better" (08).

2. OBSERVATION AND INTERPRETATION

In the present study randomly selected primary and middle schools of Bastar block (Amliguda, Kaungalguda, Mavaliguda, Besoli, Mirkuchi, Anoradkol, Kesarpal, Pollibhatta) Bakawand block (Jebal, Chindgoan, Chouknar, Chivourgoan, Karpawand, Sonpur) to check the dental fluorosis among children.

Ground water (hand pumps/ tubewells) is the main source of water used by villagers. Government of Chhattisgarh mapped this villages as fluoride endemic and installed fluoride removal plants in villages and schools. However, challenge pursist.

Table 1: Observation tabulated

S no.	Name of Village	Age Group	Symptoms Noted
1	Kaungalguda	5 to 12 yrs	<ul style="list-style-type: none"> • Teeth loose lusture • Show chalkiness • Spots and transvers • Bands and light • Yellow to dark brown color appear • Disfigurement of teeth, brittle some turn black loss of teeth
2	Amliguda	5 to 8 yrs	
3	Mavaliguda	6 to 10 yrs	
4	Mirkuchi	5 to 10 yrs	
5	Anoradkol	5 to 10 yrs	
6	Kesarpal	7 to 11 yrs	
7	Pollibhatta	6 to 9 yrs	
8	Turupura	9 to 10 yrs	
9	Badejeerakhal	5 to 10 yrs	
10	Jebal	6 to 12 yrs	
11	Chindgoan	7 to 14 yrs	
12	Karpawand	6 to 12 yrs	
13	Chivourgoan	6 to 12 yrs	
14	Chouknar	7 to 14 yrs	

Highest % of victims noted

3. SYMPTOMS OF DENTAL FLUOROSIS AND FLUORIDE LEVEL IN WATER (9)

- Teeth may show dental caries with cavities when drinking water has less than around 1mg/l.
- Teeth are generally free of both caries and fluorosis when fluoride is around 1mg/l.
- Mild dental fluorosis is developed when fluoride is in between 1 and 2.5 mg/l.
- Severe dental fluorosis is developed when fluoride is more than 2.5mg/l.
- In Mild dental fluorosis, affected teeth lose lustier and chalkiness. In the course of time, spots and transverse bonds of high yellow to dark brown colour appear, disfigurement of teeth.
- In severe dental fluorosis, teeth become brittle and turn black owing to chipping of enamel. In the course of time, there can be even loss of teeth.

4. PREVENTION AND CONTROL

Early detection is the only way of protection because there is no treatment of fluorosis. Prevention and control through interventions is the only approach to mitigate fluorosis.

There are two interventions to practice are:

- (a) Safe drinking water intervention.
- (b) Nutritional intervention.

Villagers of the prevalent area of Bastar district are poor, less or uneducated, socio-economically backward. It is extremely important to educate them, make them understandable to this endemic disease.

The drinking water source requires to be tested to fluoride, using ion selective electrode technology. The different method suggested and developed technology to get safe water. Community installation (erecting tanks) for water treatments using activated alumina technology. There is a community installation commercially a level for removal of fluoride based on the principle of savers osmosis. (Kent RO water purifying system) in the rural area, the most viable proportion of water treatment is inevitable is the use of domestic filter using activated alumina technology. The system has been standardized by IIT Kanpur with assistance from UNICEF. (11)

A natural process can be practised in Bastar since it has dense forest and heavy rainfall occurred during monsoon season. Pollution free rain water can be stored in systems and resevoirs by rain water harvesting. This water can use to dilute the fluoride contain and level to be maintained.

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