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OCCURReNCE OF FLUORIDE IN GROUNDWATER IN NANDED DISTRICT (MH) INDIA

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Abstract*:-*

Fluoride is an essential element which is good for the teeth enamel and helps to prevent dental caries, however in excessive dose it leads to chronic fluoride poisoning or fluorosis. Fluoride contamination of ground water is a growing problem, in many parts of the world. In India population of more than 66 million especially in rural parts are depends on ground water sources for drinking water and have potential risk of developing fluorosis.In the present investigation a high amount of fluoride concentration in ground water is identified in the study area where it is the only source of drinking water. in ground water was found in 1.4 to 4.26 mg/lit. These readings are beyond the permissible limit. Over all water quality was found unsatisfactory. It causes many diseases like dental fluorosis, skeletal fluorosis, early prematuarageing, etc.

Keywords:*-fluoride, contamination, skeletal fluorosis*.

INTRODUCTION

Water is essential natural resources for sustaining life and environment which we have always thought to be available in abundance and free gift of nature. however chemical composition of surface or sub surface, geothermal, on thermal is one of the prime factor on which the suitability of the water for domestic, industrial or agricultural purpose depends on ground water forms a major source of drinking water in urban as well as in rural areas.India is one of the 23 nations, which is reported to be endemic to fluorosis (UNICEF, 1999).In India the desirable limit of fluoride in drinking water is 0.8 to 1.5mg/lit (ISI, 1983;ICMR, 1987)
Fluoride contamination of ground water is a growing problem in many parts of the world. the major source of fluoride in ground water are due to fluoride bearing minerals such as fluorspar, cryolite, fluorapative and Hydroxylapatite in rocks some anthropogenic activities such as use of phosphate fertilizers, pesticides, sewage and sludge, depletion of ground water table. For agriculture have also been indicated that cause an increases in fluoride concentration in ground water. In India the high concentration of fluoride in ground water is associated with igneous and metamorphic rock. Fluoride in minute quantity is an essential element which is better for mineralization of bones, formation of teeth enamel and helps to prevent dental caries. In India fluoride is the major inorganic pollutants of natural origin found in ground water. There are more than twenty five developed and developing nation that are endemic for fluorosis. In the two largest countries India and china, fluorosis is the most severe and widespread. In India it was first detected in Nellore district of Andhrapradesh in1937. In India more than 66 million people including 6 million children suffer from

fluorosis because of consumption of water containing high concentration of fluoride. The people living in rural India are dependent on ground water for drinking water purposes. Water supplies are the worst affected and there are no other alternatives sources. In the present study the fluoride and other chemical parameter concentration in ground water was determined in the present investigation where it is the only source of drinking water.
In Maharashtra, ten districts are declared endemic for fluorosis. These are Bhandara, Chandrapur, Buldhana, Jalgaon, Nagpur, Akola, Amravati, Nanded, Solapur and Yavatmal. (Times of India, 2003) .Endemic fluoride belts serve as natural laboratories to study the effect of fluoride concentration on dental and skeletal fluorosis simultaneously (P Kotoky, 2008).The district Nanded from Marathwada region (Maharashtra) has been cited as an endemic fluoride belt but there is no detailed epidemiological and clinical study available in literature for this district.

MATERIAL AND METHOD- Collection of water samples of drinking water from all the available sources of the selected Ares where maximum people depend on such sources. Water was collected in a clean polythen bottles. 25 water samples was collected. The collected samples brought in to the analytical lab. and determined various chemical parameters along with fluoride concentration.The fluoride was analyzed District Public Health Lab Nanded. In the present study we focused only on concentration of fluoride in groundwater samples.

Study area : Nanded city, Grampanchyat Lahan (bk), Naik tanda, surrounding area of Yelegaon sugar factory, Loan, Bhokar Tq, villages are the study area. from thease location grounwater samples was collected.

RESULTS AND DISSCUSION-In the presents investigation study deals with the water quality for drinking purposes which are very important for the public health criteria so the water analysis was very important. The analytical data revealed the presence of fluoride in the ground water samples. The data showed significant variation in the water samples found during the study and results were compared with Indian water standards

Fluorides-The fluoride concentration in this area varied from 1.5 mg/l considered normal and can be represented as low fluoride region whereas concentrations greater than 1.5 mg/l can be represented as high fluoride region indicating high incidence to fluorosis. Excessive fluorides in drinking water damage toot forming cells leading to a defect in a enamel known as dental fluorosis resulting in extensive pitting, chipping, fracturing and decay of teeth. The desirable range of fluoride concentration in drinking water is from 0.6 to 1.2 mg/l according to the Bureau of Indian Standard.Thus, if the concentration of fluoride is below 0.6 and above 1.2 mg/l, the water is not suitable for drinking purposes. However, it is suggested that the maximum permissible limit can be extended up to 1.5 mg/l. based on the concentration of fluoride.The overall situations of groundwater resources are not suitable for drinking water. Contamination is mainly by natural process. Because the area is devoid of hard rocks and hence the possibility of a source is the common fluoride bearing minerals. The concentration of fluoride is not uniform in the area.

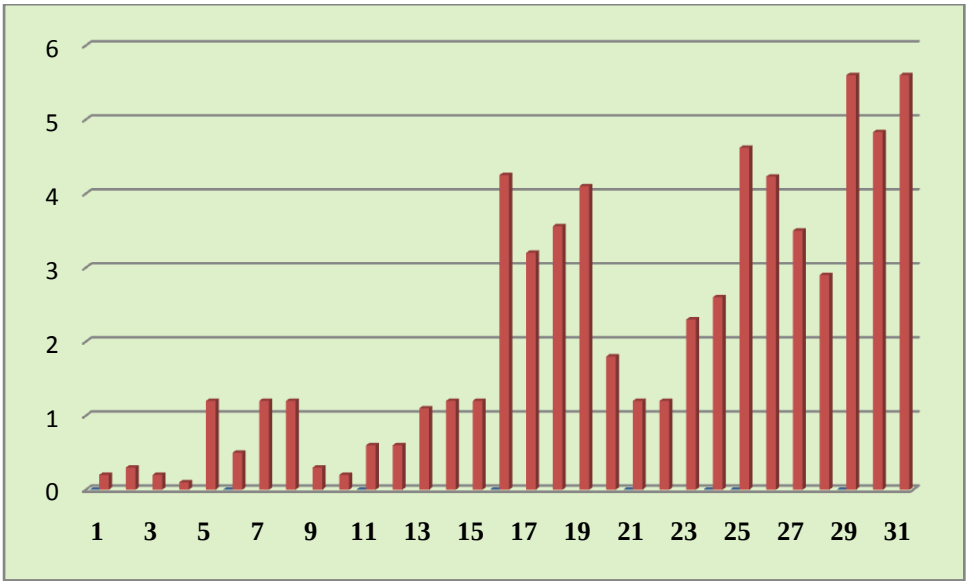
Health Effects:- The main source of fluoride intake is usually the drinking water. It is observed that many people depend on these sources which are high concentration of fluoride

in drinking water. Due to the excessive intake of such waters many people's suffered from fluorosis, number of children's shows dental fluorosis, leg deformities in adults, and loss of hairs. From the survey it was found that males and children are highly affected from fluorosis. The effects of fluoride in drinking water on animals are analogous to the effects on man (McKee and Wolf, 1963).Fluoride accumulates in bone rather than soft tissue, leading to tooth damage and bone lesions (Rose and Marier, 1977), but is transferred only slightly to eggs (Messer *et al.*,1972).Fluoride is transmitted to the fetus through the placenta (Anon,1974). Excessive fluoride affects breeding efficiency and mottles teeth (Anon, 1973), cattle develop mottled teeth when water with fluoride a t0.5 to 0.6mg/lit. And teeth are eroded at 3.3mg/lit

Table no.1 Concentration of Fion in different localities

	F ion concentration in various places in mg/lit	
Sr.no	**Name of the Location**	**F ion con mg/lit**
1	Shrinagar	0.2
2		0.3
3		0.2
4		0.1
5		1.2
2	**Vaibhav Nagar**	0.5
1		1.2
2		1.2
3		0.3
4		0.2
3	**Malegaon Road**	0.6
1		0.6
2		1.1
3		1.2
4		1.2
4	**Yelegaon Sugar factory**	**4.25**
1		**3.2**
2		**3.56**
3		4.1
4		1.8
5	**Lahan Grampanchyat ()**	1.2
1		1.2
2		2.3

6	**Bhokar**	**2.6**
1	Kolgaon	**4.62**
2		**4.23**
3		3.5
4		2.9
7	**Mahagaon**	5.6
1		**4.83**
2		5.6



Graph no.1 Showing the concentration of fluoride ion in diff.localities

Conclusion: for sustainable management of ground water study area needs regular monitering epidemiologically serveillance for dental and skletal fluorosis checkup, installation of fluoride removal plant and conduct awarness programme through public participation.

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