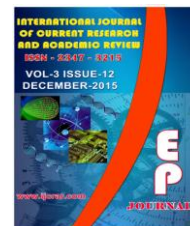




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A Study on Epidemiology of Fluorosis in Different Villages of Nalgonda District, Telangana, India

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KEYWORDS

Field survey,
Brownish
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Twisted bone
and
Walking
problem

A B S T R A C T

The present study was conducted in the villages of Nalgonda district to determine the extent of fluorosis. During our study the health problems associated with individuals with fluorosis were, (i) brownish teeth, (ii) twisted bone & walking problem, (iii) body pain, (iv) back bone pain, (v) walking problem, (vi) eyes problems, (vii) mental retardation and (viii) speech and swallowing problem. Highest percentages were observed in the case of brownish teeth (17.08) and twisted bone & walking problem (17.08). The percentages for body pain, back bone pain, walking problem, eyes problems, mental retardation and speech and swallowing problem ranged between 7.32 - 2.44.

Introduction

Water is an essential resource for living systems, industrial processes, agricultural production and domestic use (Bhalla M., *et al* (2014). The occurrence of endemic fluorosis worldwide is attributed to the presence of excessive fluoride in drinking water. Excessive fluoride intake causes fluorosis, paraplegia, arthritis and other diseases (Yiamouyiannis (1993), Waldbott GL. (1998, Maurer JK, *et al* (1990), Cohn PD (1990) and Li XL *et al* (1995). It also affects human intelligence, especially in children, who are most susceptible to early fluoride toxicity (Waldbott GL. (1998, Maurer JK, *et al*

(1990), Cohn PD (1990) and Li XL *et al* (1995). Nalgonda district is one among the several States in India with high incidence of fluorosis. The fluoride levels in these districts range from 2 to 7 mg/L. People suffer from various skeletal deformities like genu varum, genu valgum, antero posterior bowing of tibia, kyphosis, exostosis etc, muscular tenderness, neck rigidity, stiffness of joints and mental retardation (A S Narayana., *et al*). Owing to its strong electro negativity, fluoride gets attracted to positively charged calcium in teeth and bones. This could be the causes for dental

and skeletal fluorosis in individuals who are dependent on drinking water that contains high fluorine. Although fluorosis is most prevalent and wide spread in India and China, at least 25 other countries across the globe are known to be endemic.

Materials and Methods

Study Area

The present study was conducted in the villages of Nalgonda district by random sampling approach. A preliminary survey was carried out to select areas in which fluorosis was most prevalent. After selecting the areas, consent of the affected individuals were taken and these individuals were informed about the purpose of our study. The symptoms were recorded by personally interviewing each of the affected individuals. After collecting the data, symptoms were tabulated and the percentage for each individual symptom was calculated.

Results and Discussion

Several individuals were interviewed and 41 individuals belonging to different age groups (Table1) were selected for our study. The study was conducted to evaluate the

extent of fluorosis in individuals residing in the areas of Nalgonda district that had high fluorine levels in drinking water. The disease caused manifests itself in three forms, namely, dental, skeletal and non-skeletal fluorosis. During our study we encountered individuals with various health problems such as (i) brownish teeth, (Arlappa N *et al.*, (2013) (ii) twisted bone & walking problem (Arlappa N *et al.*, (2013), (iii) body pain, (iv) back bone pain, (v) walking problem, (vi) eye problems, (vii) mental retardation and (viii) speech and swallowing problem. Some of these symptoms were reported by Varsha Dhurvey *et al* (Varsha Dhurvey *et al.*, (2014). Results of these symptoms are summarised in Tables I and II. Percentage for each of the health problem (all age group were included) was calculated and results are presented in figure 1 and II.

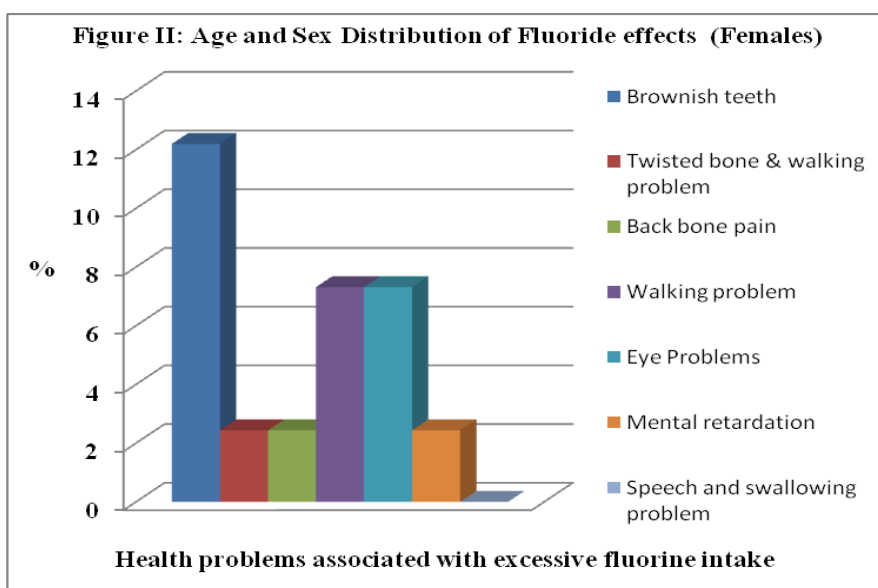
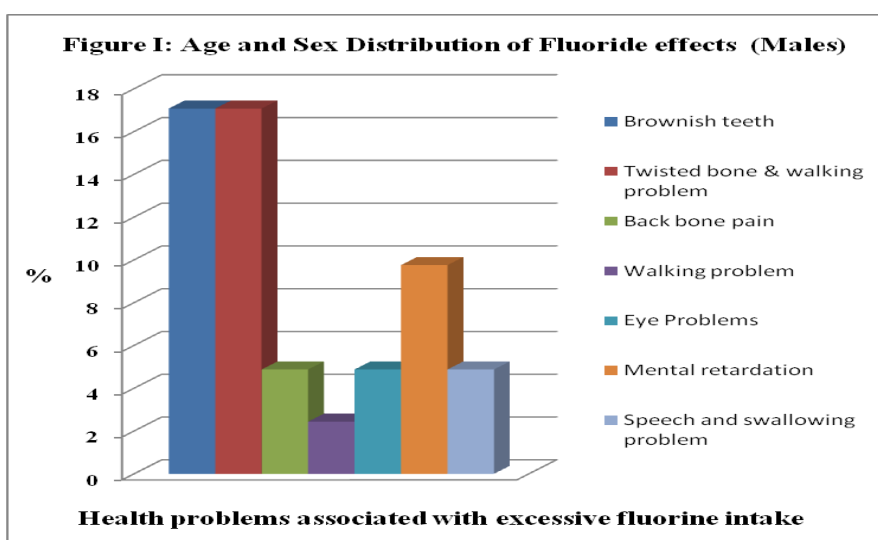
Among the various health problems associated with excessive fluorine intake, highest percentage was observed for brownish teeth and twisted bone with walking problem (Brownish teeth:males-17.08, females-12.2; twisted bone & walking problem: males-17.08; females-2.44.

Table.1 Age and Sex Distribution of Fluoride Effects

Age group	Brownish teeth (photograph 3)		Twisted bone & walking problem (photograph 3)		Back bone pain		Walking problem	
	Male	Female	Male	Female	M	F	M	F
0-20	1	1	4	-	-	-	-	-
21-40	2	1	1	1	-	-	-	-
41-60	2	-	1	-	1	-	-	-
60 above	2	3	1	-	1	1	1	3
Total	7	5	7	1	2	1	1	3
41=100%	17.08	12.2	17.08	2.44	4.88	2.44	2.44	7.32

Table.2 Age and Sex Distribution of Fluoride Effects

Age group	Eye problems		Mental retardation (photograph 6)		Speech and swallowing problem	
	Male	Female	Male	Female	Male	Female
0-20	-	-	3	-	-	-
21-40	1		1	1	1	-
41-60	-	1	-	-	-	-
60 above	1	3	-	-	1	-
total	2	3	4	1	2	0
41=100%	4.88	7.32	9.76	2.44	4.88	0



Photograph.1 Fluorosis Affected Individuals of Different Age Groups



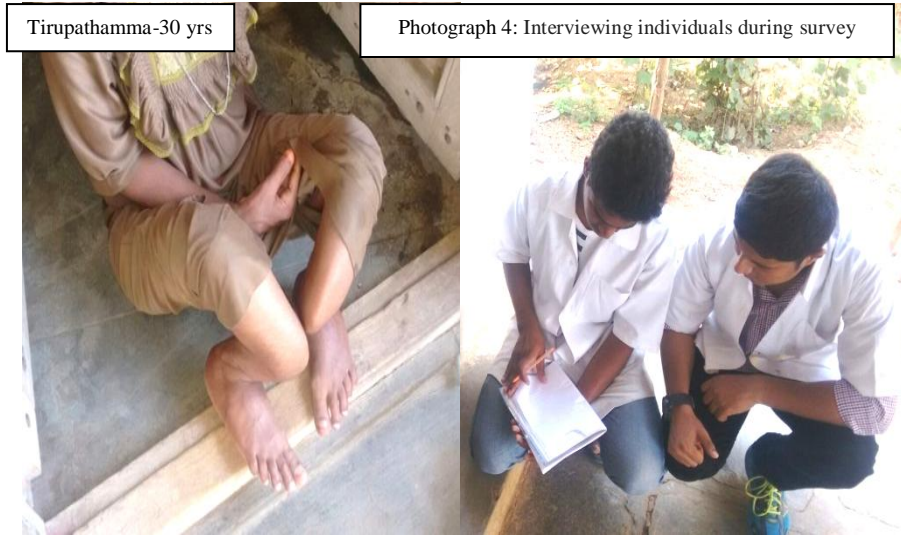
Photograph.2 Brownish Teeth



Photograph.3 Twisted Bone



Photograph.4 Interviewing Individuals During Survey



Photograph.5 Severe Fluorosis



Photograph.5 Twisted bones and Mental Retardation



This observation clearly suggests that the fluorine is getting deposited on to the teeth and bones. These observations on the effects of excessive fluoride intake on humans is in accordance with those reported in literature (Yiamouyiannis (1993), Waldbott GL. (1998, Maurer JK, *et al* (1990), Cohn PD (1990), Li XL *et al* (1995) and A S Narayana., *et al*). It was learnt that the efforts of Government and other social organizations in setting up units for defluoridation of drinking water has reduced the incidence of fluorosis. However, some of the individuals are encountering problems like cold, cough and fever when they are using defluoridation drinking water. If concern authorities can solve this problem along with medication it will be of great help to the people living in these regions.

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