Quantitative Effects Of Fluoride In Kidney Of Swiss Albino Mice

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Abstract- Fluoride occurs in the environment in water, soil, air, food, and vegetation significantly increased body burden, fluoride was discovered by karl schele in 1771, recognize as halogen in 1825, it was the 13 most abundant elements in earth crust. The range of species in animal experiments that reported adverse effects. Fluoride is the ionic form of the most electronegative elements fluorine, which is widely distributed in igneous and sedimentary rocks; earth's crust and oceans. Water pollution has become world-wide phenomenon. Both deficiency and excess of minerals and trace elements in water can have deleterious consequences on biological system. The major ecological problem are the pollutants from industries, pesticides, herbicides, fertilizers and chemicals. The underground water is polluted by many hazardous pollutants like colored dyes, nitrates, metals, pesticides and fluoride. Fluoride is one of major concern among these pollutants. The problem due to high concentration of fluoride in ground water has now become one of the most important health geo-environmental issues in India. Fluoriosis has been stated that 45% of the water sources have fluoride content exceeding 10ppm and varied from 0.5 to 50ppm the most seriously affected areas of the India are Andhra Pradesh, Punjab, Maharashtra, Rajasthan, Karnataka, Orrissa and Bihar. Fluoride affects the structure and function of several tissues and organs of mammals, including liver, muscle, kidney, brain, endocrine glands, reproductive organs in both male and female, is mainly caused by drinking water.

Index Terms- Fluoride, Fluorosis, toxicity, Thar desert. Drinking water etc.

I. INTRODUCTION

The underground water is polluted by many hazardous pollutants like colored dyes, nitrates, metals, pesticides and fluoride. Fluoride is one of major concern among these pollutants. The problem due to high concentration of fluoride in ground water has now become one of the most important health geo-environmental issues in India. The problem due to high concentration of fluoride in ground water has now become one of the most important health geo-environmental issues in India. Ground water fluorosis is due to present of sedimentary rocks like granite ,mica, limestone, gypsum ,clays etc these rocks contain fluoride range of 185-3100ppm.Weathering condition of Thar increasing of F concentration in ground water. Fluorosis which was considered to be a problem related to teeth only has now turned up to serious health hazard. However no system of the body can be considered as exempt. 2 3- at the normal levels of fluoride ingestion (approximately 6 mg/day) almost 87% of the absorbed fluoride is excreted through kidneys. Domestic cattle's like cow, buffalo, camel, goat, sheep are dependent on underground water for drinking in rural areas of Thar desert. The main sources of the underground water in the desert areas are deep well, pokhar, diggi and ponds. According to WHO standard rate of drinking water is 0.5-1.5 ppm but the highest rate of fluoride concentration of water reported in western desert belt of the Rajasthan.Fluoride levels of the drinking water in Thar desert are10.1-20.0 ppm it is the toxic concentration for the humans and domestic animals.Some study on the laboratory animals like swiss albino mice is shows the toxic conditions on animals due to the fluoride rich drinking water.

II. MATERIALS AND METHODS

Adult mice (six to seven weeks old) were procured from CCS Agricultural University, Hissar and maintained at 20-25°C. The animal were provided with standard mice feed and water ad libitum. Sodium fluoride was procured from Qualigens Fine Chemicals, Mumbai, India. Animals received sodium fluoride in drinking water. The animals were divided into various groups and were given 10 ppm, 25 ppm and 50 ppm of sodium fluoride for 7, 14, and 28 days. Recovery studies were also performed after cessation of the treatment. These will be provided sodium fluoride with the standard pellet feed and they will receive distilled water ad-libitium. Animals from each groups will be autopsied by cervical dislocation at each post treatment interval of 28 days. The weight of the animals will be recovered and kidneys will be removed and kept at – 20C for histological estimation. The studies will be taken into consideration.

Group-I – given 10ppm fluoride rich drinking water with the standard pellet feed and sacrificed after 28 days.
Group-II- given 25ppm fluoride rich drinking water with the standard pellet feed and sacrificed after 28 days.
Group-III- given 50ppm fluoride rich drinking water with the standard pellet feed and sacrificed after 28 days.

III. OBSERVATION

Kidneys are the primary organs concerned with excretion and retention of fluoride exposure. Toxic effects of fluoride related to tissue fluoride concentration intake of high concentration of fluoride rich drinking water increases the toxic manifestations of fluorosis. The present study on the fluoride on kidneys clearly indicates that the 28-30 days exposed mice exhibits renal toxicity. The fluoride treated groups shows significant morphological damage to the renal cortex. The glomeruli were observed exhibiting different forms of degeneration. These experimental groups shows the histological toxic effects:-

1. After 20 days of dose treatment:-Bowman's capsule has narrowed, glomeruli shrunk, monocytic nuclear infiltration, nuclear pyknosis in renal tubules.

2. After 30 days of dose treatment:- Glomeruli with mesangial proliferation were appear, increased pyknosis in renal tubules, tubular lumens were filled with fluid.

IV. CONCLUSION

These present study shows that the toxic effects of fluoride on the mammals kidney and it is clearly indicate that long time days of sodium fluoride expose mice exhibits renal toxicity histological changes in the kidneys interrupt the function of kidneys of mice.

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