

Effect of Sodium Fluoride Toxicity and Its Reverse Effect on Reproductive Organs of Male Albino Rats

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ABSTRACT

Excessive intake of fluoride leads to dental, skeletal and reproductive organs fluorosis which has no cure. fluorosis in an irrisible condition and has no cure, prevention is the only solution. In the present study of male albino rats (*Rattus rattus*), weighing between 150-200gm., were kept on sodium fluoride treated water (5,20,50)mg./kg. b.w. for 60-90days. The results revealed that the fluoride water exposure to male rats when after rest period of 30days – 90days. Weights of reproductive organs (Testes, Epididymis, Vas deferens, Seminal vesicle and Prostate). The data suggests that the sodium fluoride water exposure for 60-90 days caused adverse effect on reproductive organs, weight decreased significantly as compared to control.

KEYWORDS: Sodium Fluoride, Male Albino Rats, Fluoride Toxicity

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INTRODUCTION

Fluoride is a trace element and has clinical importance as it prevents dental caries (Robert Jr. 1980) and is used for the treatment of Paget's disease (Robert Jr. 1980). Besides its clinical importance, at present fluoride is considered as an important water pollutant. Fluoride contamination of ground water was noted above the tolerable limit in Sri Lanka, China, West Indies, Spain, Holland, Italy, South and North America, and India (Suma Latha et al. 1999). In India, fluoride contamination of the top aquifer system was also noted in Andhra Pradesh, Tamil Nadu, Karnataka, Gujrat, Rajasthan, Punjab, Haryana, Bihar, Kerala and West Bengal (Handa 1975; Suma Latha et al. 1999). The tolerable limit of fluoride in drinking water is 1ppm (Erickson 1978; Robert Jr. 1980; Agrawal et al. 1997), but at various zones in India, the drinking water contains 10 to 25ppm of fluoride (Handa 1975; Teotia et al. 1984). Toxic effects of fluoride results in inhibition in he Krebs's cycle (Bogin et al. 1976) as well as induction of muscle atrophy (Kaul and Susheela 1974; Susheela

and Kharp 1990), liver toxicity (Saralakupari et al. 1988; Carlson and Suttle 1996), and kidney toxicity (Suketa and Terui 1980), There is paucity of information of fluoride on the reproductive system. Few reports available in this line stated that fluoride toxicity results in impairment of fertility (Messer et al. 1973), low birth rate (Messer et al. 1973; Ferni 1994), and de flagellation of sperm both in human and experimental animals (Chinoy and Sequeria 1989). Recently, we reported that fluoride intoxication is associated with inhibition in testicular androgenesis and gametogenesis (Ghosh et al. 2002). The present investigation has been undertaken to focus on the effects of sodium fluoride water on reproductive functions of male albino rats.

Materials and Methods

The study was conducted on adult male albino rat (*Rattus rattus*), of average age of 12-14 weeks. They were acclimatized to laboratory conditions for 15days, the rats were kept in open air cages (60x45x45 cm) at

room temperature. The rats were fed standard rodent pellet diet (Hindustan Lever Ltd.) and water was allowed ad libitum, (Endmond 1950).

Animals were divided equally into 4 groups of 10 animals each group: Group 1-Control, Group 2-4, 5,20,50mg/kg b.w. for 60days.

Thirty days after cessation of treatment i.e., on (90th) day, the animals were sacrificed by cervical dislocation. Body weight of all the animals were recorded at the initiation of the experiment and

continued at weekly intervals till the completion of the experiment.

Reproductive tissues viz.testis, epididymis, vas deference, seminal vesicle and prostate were removed. The fresh weight of tissues /organs were recorded. The tissues were then processed for histological studies.

Effect of Sodium Fluoride on the body weight and reproductive tissue wet weight in male rats.

Table: 1

Treatment	Dose (mg/kg)	Duration (Days)	Initial b.w. (g)	Final b.w. (g)	Testis	Epididymis	Vas Deference	Seminal Vesicle	Prostate
Reversibility**									
		60	174.55 +1.60						
Control		90		182.55 +1.40	951.33 +3.01*	320.85 +3.33	220.56 +1.39	320.37 +3.46	473.47 +3.59
Sodium fluoride	5		162.21 +4.1	170.10 +1.30	947.22 +1.25	315.70 +3.30	220.70 +1.65	377.10 +1.31	471.20 +1.41
Doses	20		175.10 +2.50	180.60 +4.2	943.10 +1.33	315.73 +2.62	210.97 +1.15	380.75 +1.62	475.15 +1.62
	50		162.35 +2.10	170.62 +4.2	915.10 +2.42	312.16 +1.15	210.10 +1.35	379.10 +2.62	460.45 +1.2

** 30 days of withdrawal of treatment (after 60 days of treatment) values are mean \pm SE (n= 5) * denotes significance at 5% level in each category –6 Rats/ Tissues were used.

Results and Discussion

The male rats exposed to sodium fluoride (5,20,50mg/kg b.w.) for 60days revealed that the reproductive organs weights of testes, Epididymis, Vas deferens, Seminal vesicle were declined significantly as compared to control value (Table –1) Annexure-1

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