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TOXIC EFFECTS OF FLUORIDE IN DOMESTIC ANIMALS

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Toxic effects of chronic fluoride (F) exposure in the forms of dental, skeletal and non-skeletal fluorosis were observed in diverse species of domesticated animals viz., 386 cattle (*Bos taurus*), 131 buffaloes (*Bubalus bubalis*), 67 sheep (*Ovis aries*), 158 goats (*Capra hirus*), 11 horses (*Equus caballus*), and 7 donkeys (*E. asinus*) from 10 villages of Dungarpur district of Rajasthan, India. The mean F concentration in drinking water in these villages ranged from 1.5 to 4.4 ppm. Out of 760 animals 370 (48.68) were found to be afflicted with mild to dental mottling with varying grades. Equuses showed relatively a high incidence (81.8%) of dental fluorosis. Mandibular and maxillary teeth were bilaterally and vertically or horizontally brown to black-yellowish in color. The prevalence of dental fluorosis was relatively higher in immature (94.0%) animals as compared to their counter parts (42.0%).

On clinical examination 42.8% animals revealed periosteal exostoses, intermittent lameness, hoof deformities, stiffness in the legs and tendons and wasting of main mass of hind quarter and shoulder muscles. Fluorosed animals also showed signs of non-skeletal fluorosis such as gastro-intestinal discomforts, impaired reproductive functions, neurological disorders, and congenital abnormalities. Prevalence and severity of these F effects increased with increasing F concentration in water and age. Data pertaining to the relationship between F concentration and prevalence figures of dental and skeletal fluorosis were statistically analyzed and found to exhibit highly positive correlations. Possible factors causing variations in severity and prevalence of fluorosis in diverse species of animals of same F endemic areas are discussed.

INTRODUCTION

Chronic exposure of fluoridated ground water causes a health problem in man (W.H.O.1970), and animals (Swarup and Dwivedi 2002; Choubisa *et al.* 1996; Choubisa 2001a, b) in the form of fluorosis. Its primary manifestations are mottling of teeth (dental fluorosis) and osteo-sclerosis (skeletal fluorosis). Besides these, non-skeletal fluorosis or toxic effects of fluoride (F) in soft tissues viz., gastro-intestinal discomforts, neurological disorders, impaired reproductive functions, and teratogenic effects have also been reported

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