Adv. Pharmacol. Toxicol. 13 (1) 2012, 9-13
ISSN - 0973 - 2381

TOXIC EFFECTS OF FLUORIDE ON HUMAN BONES

S. L. Choubisa*
P. G. Department of Zoology, Government Meera Girls' College, **UDAIPUR-** 313001

Radiological changes in different bones were observed in 3 to 12 tribal subjects (>40 years age) affected with varying grades of skeletal fluorosis. These individuals were living since birth in fluoride (F) endemic villages of southern Rajasthan, India. Their drinking water sources contained 1.5 to 6.0 ppm F. Radiographs (x-rays) of cervical, chest, lumbo-dorsal, forearm, legs and pelvis of these subjects revealed increased mass and density, chalky-white appearance, osteosclerosis, bony out growth (osteophytoses), roughening of periosteal surface, and thickening and calcification of ligaments and interosseous membranes in general. These radiological changes were found to be more progressive with increasing age, F concentration in drinking water, and grades of skeletal fluorosis. Various radiological bony changes are discussed in detail. These findings are more useful and significant in diagnosis as well as identification of severity or various grades of skeletal fluorosis.

INTRODUCTION

It is well known that calcium (Ca^{++}) has relatively more affinity with fluoride (F^-) due to their electronic configuration. In human body bones and teeth have maximum amount of calcium which attracts and binds with maximum amount of available fluoride and deposited in the form of clacium-fluoro-apetite (CaF_2) crystals. During this process unbound calcium is also lost (W.H.O.1970). Longer duration of this process and excessive deposition of F and loss of calcium both lead to develop diverse pathognomonic signs of chronic F intoxication, dental and skeletal fluorosis. Development of skeletal fluorosis caused by excessive deposition of F in bones and their associates, ligaments, tendons and muscles lead to architectural changes. Although several workers (Azar *et al*. 1961; Chawala *et al*.1965; Jolly *et al*. 1969; Teotia *et al*. 1971; Roholm 1973; Choubisa 1996a, 1999, 2001) studied these bony changes radiologically (X-rays). However, none of them reported these diverse bony changes in subjects affected with varying grades of skeletal fluorosis. Therefore, here are presented radiographs of bones of different regions of individuals suffering from mild, moderate/ moderately severe and severe skeletal fluorosis as these radiographs will be more useful and informative in diagnosis and identification of severity or various grades of skeletal fluorosis.

* Corresponding Author