FLUORIDE

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Fluoride

Fluoride is an important trace element in human life. It is required for the maintenance of dental health and bone structure. Fluoride is useful in formation of dental enamel and also in preventing teeth from decay. Normal metabolism of bones and teeth require fluoride. It helps in facilitating the nucleation process prior to bone mineralization. Fluoride provides protection against periodontal disease and osteoporosis.

Fluoride is widely found in natural sources. Soil, drinking water, foods particularly seas foods and tea are the sources of fluoride. The chief source is drinking water. Fluoride is almost universally distributed in all types of water such as ground water, seawater, subsoil water and surface water. The fluoride content of all potable water used for consumption ranges from traces to toxic levels. The

surface water contains fluoride below 1 ppm while seawater contains slightly higher fluoride than surface water (0.8 to 1.6 ppm). The fluoride content of ground water ranges from less than 1 ppm to 25 ppm.

The amount of fluoride in diet is of significance as it includes the ingestion of fluoride from both food and water. Fluoride content of food varies on the basis of climatic condition, soil condition, part of the plant, crop cultivation, management practices followed etc. Cereals and pulses contain 0.1 – 0.7 ppm and 0.6 – 3.00 ppm fluoride respectively. Fruits and vegetables contain fluoride less than 1 ppm. Roots accumulate more fluoride content compared to other parts. Sea foods such as fish and shrimp products contain up to 50 ppm. Tea is also another good source of fluoride.

Fluoride is an essential trace

element required by human being in small quantity. A total daily intake recommended as adequate and safe for adults is 1.5 mg to 4.5 mg. Children from four years age and adolescents require daily an amount of 2.5 mg fluoride. Recommended intake of fluoride during first year of life is from 0.1 mg to 1.0 mg and 0.5 to 1.5 mg during the subsequent two years.

Fluoride enters into human body through drinking water and food. After ingestion of fluoride, ionization and absorption occur in human body then fluoride is freely distributed to all parts of the body through blood. Body fluoride is mostly found in small amounts in normal bone and teeth under normal conditions. Half of ingested fluoride is excreted

through urine, feaces, sweat, saliva and secretion of milks during lactation. 20 to 33 per cent of the ingested fluoride is excreted through urine within 3 to 4 hrs per day.

High intake of fluoride is hazardous to human health. Higher intake of fluoride for a long period of time leads to excess deposition of fluoride in the body and the condition is known as fluorosis which is endemic disease. It is common in the areas where the fluoride content is too high in soil and water. The fluorosis can be classified as dental fluorosis, skeletal fluorosis and non skeletal fluorosis. The characteristic features of dental fluorosis are dental mottling, discoloration of teeth, lusterless and no shine on enamel, cavities in teeth, loss of teeth etc. The clinical features of skeletal fluorosis include muscular skeletal, dysfunction, arthritis, restricted movements of joints,