Estimation of Zn and I

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Lab -4- Metabolic Disorders

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Zinc, an essential trace element which helps in the various metabolic pathways, is required for growth and sexual development. It is a structure component of various proteins, help to regulate the activity of more than 300 enzymes and genetic expression control by synthesis and repair of DNA, RNA and protein.

It is required for cell division, growth and differentiation, performance, development and aging in animals. Within visceral organs zinc is present in traces but skin, hair and wool contain zinc in high quantities. Zinc in serum is totally bound with protein with most of it (60%) bound to albumin.

Increased zinc levels

Gastro-intestinal disorders associated with nausea, vomition, high fever and metallic taste.

Decreased zinc levels

-Low dietary intakes

-Low bioavailability

-Malabsorption syndrome

Clinical significance: Deficiency of zinc may lead to following clinical anomalies:

-There is inappropriate growth of bones and the bones remain fragile due to decreased osteoblastic activity in zinc deficiency.

-Zinc responsive dermatitis in which alopecia and generalized dermatitis may be seen around the head and neck region.

-Zinc deficiency and excess calcium may cause imperfect keratiniztion of the skin epithelial cells known as parakeratosis.

-Other clinical signs of zinc deficiency include acrodermatitis, low immunity, diarrhea, poor healing.

Diagnosis

-History of diet

-Clinical findings

-Estimation of zinc level

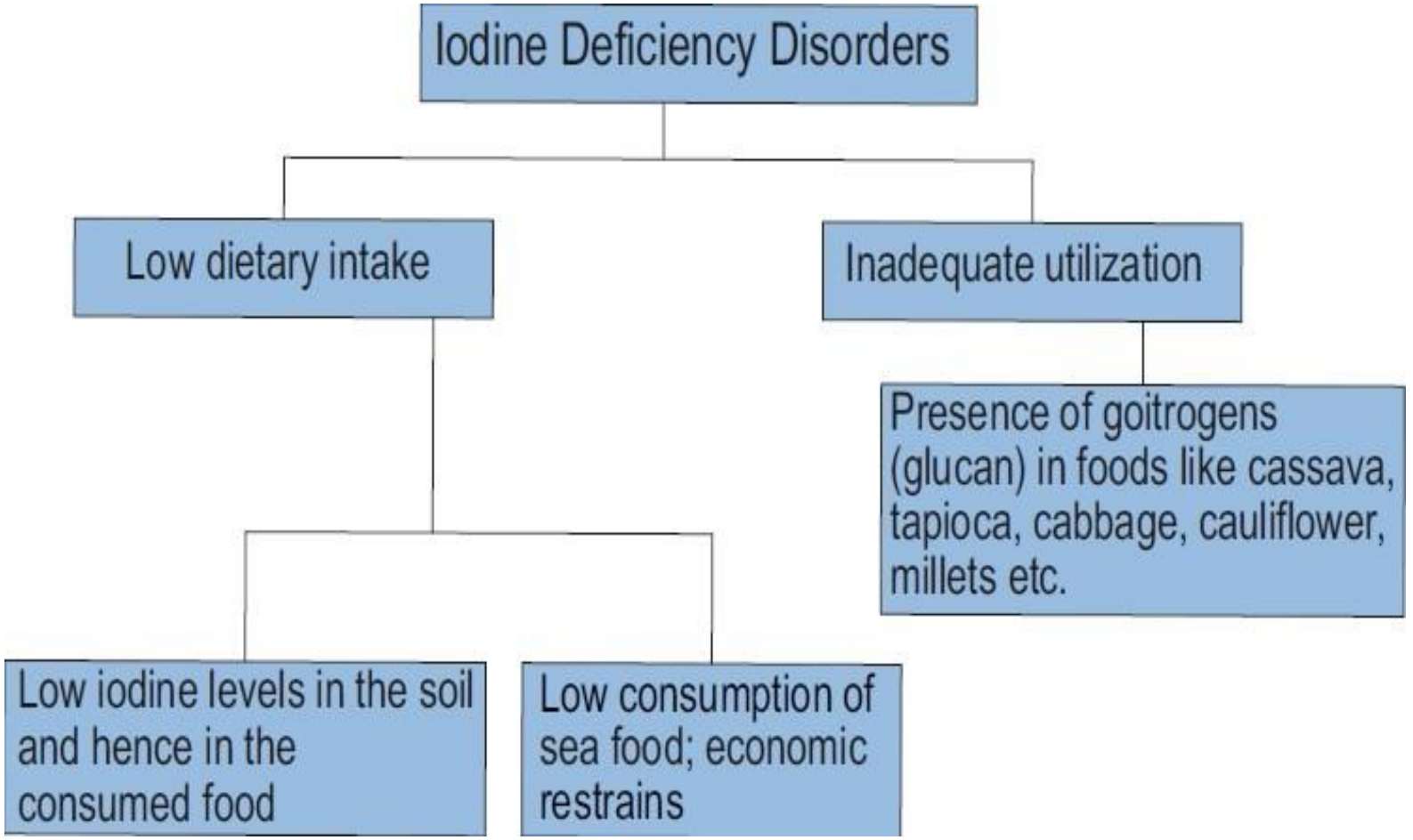
-Zinc deficiency may cause reduction in alkaline phosphatase and carbonic anhydrase level of serum

Iodine is a micronutrient of crucial importance for the health and well-being of all individuals. It is a trace element, just 5 gm of which are sufficient to meet the life-time needs of an individual with a life-span of 70 years. Iodine is mostly concentrated in thyroid gland. A healthy adult body contains 15-20 mg of iodine, 70-80% of which is stored in the thyroid gland.

Function

Iodine is an essential component of the thyroid hormones, triiodothyronine (T_3) and thyroxine (T_4), and is therefore essential for normal thyroid function.

Iodine deficiency disorders: the two major factors responsible for IDD are inadequate iodine intake and inadequate iodine utilization.



Acute toxicity

Acute iodine poisoning is rare and usually occurs only with doses of many grams.

Symptoms of acute iodine poisoning include burning of the mouth, throat, and stomach, fever, nausea, vomiting, diarrhea, a weak pulse, cyanosis, and coma.

Excessive iodine intakes:

-Risk of iodine-induced hyperthyroidism in iodine-deficient individuals:

Iodine supplementation programs in iodine-deficient populations have been associated with an increased incidence of iodine-induced hyperthyroidism (IIH), especially in older people with multi-nodular goiter. IIH symptoms include weight loss, tachycardia (high pulse rate), muscle weakness, and skin warmth.

-Risk of hypothyroidism in iodine-sufficient individuals:

In iodine-sufficient individuals, excess iodine intake is most commonly associated with elevated blood concentrations of thyroid-stimulating hormone (TSH) that inhibit thyroid hormone production, leading to hypothyroidism and goiter.

Thank you for listening