Faqs

1. What are Vitamins? How are they classified?
Ans: Vitamins are organic substances present in small amounts in food. Vitamins are considered essential, the word vita means 'life' in Latin. Vitamins were discovered based on their function and chemical nature and were designated as A, B, C, D. Vitamins are classified based on their solubility as fat-soluble and water-soluble vitamins. Water-soluble vitamins are not accumulated in the body, but are readily excreted. Water-soluble vitamins are members of the B-complex and vitamin C (ascorbic acid). Most of the B-complex group can be further divided according to general function: energy releasing or hematopoietic. Other vitamins cannot be classified this narrowly because of their wide range of functions.

Water Soluble Vitamins
2. Discuss about the deficiency of Vitamin C.
Ans: Prolonged deficiency of vitamin-C produces a disease condition called as 'scurvy' in both infants and adults. Scurvy is typically manifested when the total body vitamin-C pools fall below about 300mg and plasma vitamin-C concentrations drop to <0.2mg/dL. Scurvy is fatal if untreated. The four Hs—hemorrhagic signs, hyperkeratosis of hair follicles, hypochondriasis (psychological manifestation), and hematologic abnormalities (associated with impaired iron absorption)—are often used as a mnemonic device for remembering scurvy signs

3. Explain about Infantile and Adult Scurvy.
Ans: a. Infantile scurvy: In Infantile scurvy loss of appetite will be present, failure to gain weight, irritability, palor, defective growth of bones. Haemorrhage occurs under the skin. There will be defective formation of teeth and gums will be swollen (Figure). The ends of the ribs become prominent resulting in beaded appearance called scorbutic rosary.

Figure: Scorbutic gums in vitamin C deficiency gums are swollen, ulcerated, and bleeding
b. Adult Scurvy:
i.General manifestations are fever, susceptibility to infection, lethargy, fatigue, rheumatic pains in the legs, muscular atrophy and delayed wound healing.
ii.Anaemia: Microcytic hypochromic anaemia develops due to failure of absorption of iron.
iii.Gums become spongy and bleed easily. Gums become swollen, ulcerated and eventual tooth loss.
iv.The blood vessels become fragile and porous due to defective formation of collagen. Joints become swollen and tender.
v.Clinical symptoms appear when total body pool of vitamin-C decreases. Skin becomes rough and dry. There will be small petechial hemorrhages around hair follicles (Figure).

4. What is beriberi? Mention the types of beriberi

Ans: Deficiency of thiamine is associated with low calorie intake. Severe deficiency of thiamine produces a disease known as beriberi (beri means “weakness”) (Figure). One of the first symptoms of thiamin deficiency is a loss of appetite (anorexia) and thus weight loss. As the deficiency worsens, cardiovascular system involvement (such as hypertrophy and altered heart rate) and neurological symptoms (such as apathy, confusion, decreased short-term memory, and irritability) appears.

There are three types of beriberi

a.Dry beriberi

b.Wet beriberi

c.Acute/Infantile beriberi

5. Discuss about Infantile beriberi and Wernicke-Korsakoff syndrome

Ans: Infantile beriberi occurs in first few months of life if the diet of the mother is deficient in thiamine. Symptoms are anorexia, vomiting, restlessness, sleeplessness, constipation, enlargement of the heart and breathlessness.

Thiamin deficiency is often associated with alcoholism. Wernicke’s encephalopathy or Wernicke-Korsakoff syndrome, a neuropsychological complication, is also commonly found in those with alcoholism and AIDS, and in those receiving parenteral nutrition that is high in dextrose and low or absent in thiamin. People with alcohol dependency are particularly prone to thiamin deficiency because of:

- decreased intake of the vitamin from decreased food consumption
- increased requirement for the vitamin because of liver damage
- decreased thiamin absorption

Wernicke’s encephalopathy is characterized by ophthalmoplegia (paralysis of the ocular muscles), nystagmus (constant, involuntary eyeball movement), ataxia (impaired muscle coordination), loss of recent memory and confusion.

6. Explain the effects of Riboflavin deficiency.

Ans: A deficiency of riboflavin, known as ariboflavinosis, rarely occurs in isolation but most often is accompanied by other nutrient deficits. Riboflavin deficiency is prevalent mainly among the low income groups particularly the vulnerable group and the elderly adults. Riboflavin deficiency becomes manifest after several months of deprivation of the vitamin. Riboflavin deficiency is characterized by

i.Soreness and burning of the mouth and tongue.

ii.Lesions at the angles of the mouth called Angular Stomatitis (cracks in the skin at the corners of the mouth).

iii.The inflammation of the tongue called glossitis

iv.Dry chapped appearance of the lip with ulcers termed cheilosis.

v.The skin becomes dry and results in seborehoeic dermatitis.

vi.Photophobia, lacrimation, burning sensation of the eyes and visual fatigue.

vii.Decreased motor co-ordination
viii.Normocytic anaemia

7. Explain the three Ds of Niacin deficiency.
Ans: Deficiency of niacin causes a disease known as pellagra. It is characterized by three D's -Dermatitis, Diarrhoea and Dementia.
a.Dermatitis–Name pellagra comes from pelle-skin and agra-rough. Marked changes occur in the skin especially in the skin exposed to sun and friction areas like elbows, surfaces of arms, knees. Lesions are symmetrically distributed, in the affected parts. At first there is reddening, thickening and pigmentation of the skin. Later on there is exfoliation leading to ultimately parchment of skin –butterfly like appearance.
b.Diarrhoea–Diarrhoea enhances the deficiency state. There are structural and absorptive defects in the small intestine. Tongue appears raw, and mucous membrane of the tongue is inflammed. Gastrointestinal manifestations include glossitis, cheilosis, stomatitis, nausea, vomiting, and diarrhea or constipation.
c.Dementia–There is irritability, depression, poor concentration and loss of memory. Delirium is a common mental disturbance.
8. Explain the effects of Pantothenic acid deficiency.
Ans: Deficiency of pantothenic acid causes Burning feet syndrome. It is characterized by numbness of the toes and a sensation of burning in the feet. The condition is exacerbated by warmth and diminished with cold and is thought to result from pantothenic acid deficiency. Other symptoms of deficiency include vomiting, fatigue, weakness, restlessness, and irritability. Deficiency of pantothenic acid is thought to occur more often in conjunction with multiple nutrient deficiencies, as for example in malnutrition. Some conditions that may increase the need for the vitamin include alcoholism, diabetes mellitus, and inflammatory bowel diseases. Increased excretion of the vitamin has been shown in people with diabetes mellitus.

9. What are the types of Pyridoxine?
Ans: Pyridoxine is unique among B–complex. Pyridoxine denotes related substances such as Pyridoxine, Pyridoxal and Pyridoxamine are three forms in which it is present in our body. Pyridoxine represents the alcohol form, pyridoxal the aldehyde form, and pyridoxamine the amine form.

10. Explain the effects of Pyridoxine (B6) deficiency.
Ans: Pyridoxine (B6) deficiency leads to abnormalities in protein metabolism which is manifested as poor growth, convulsions, anaemia, decreased antibody formation and skin lesions. Severe deficiency leads to microcytic hypochromic anaemia. Symptoms such as weakness, nervousness, irritability, insomnia and difficulty in walking is predominant. Deficiency also alters calcium and magnesium metabolism, impairs niacin synthesis from tryptophan, and inhibits metabolism of homocysteine. The last results in hyperhomocysteinemia, a risk factor for heart disease. Groups particularly at risk for vitamin B6 deficiency are the elderly, who have a poor intake of the vitamin; people who consume excessive amounts of alcohol and people on a variety of drug therapies.

11. What are the effects of Biotin (B7) deficiency in humans?
Ans: Biotin deficiency in humans is characterized by lethargy, depression, hallucinations, muscle pain, paresthesia in extremities, anorexia, nausea, alopecia (hair loss), and scaly, red dermatitis. A diet devoid of biotin can result in decreased plasma biotin and in reduced biotin excretion in about 2-4 weeks. Biotin deficiency or poor biotin status, though fairly rare, occurs in various populations. People who ingest raw eggs in excess amounts are likely to develop biotin deficiency because of impaired biotin absorption. Impaired biotin absorption also may occur with gastrointestinal disorders such as inflammatory bowel disease and achlorhydria (lack of hydrochloric acid in gastric juices), in people on anticonvulsant drug therapy, or in chronic consumers of excessive amounts of alcohol. Biotin status has been shown to decline in some women during pregnancy.

12. What are the effects of Folic Acid Deficiency?
Ans: Simple folate deficiency results in the bone marrow producing immature cells (megaloblasts cells) and few matured red blood cells. This results in reduced oxygen–carrying capacity causing anaemia termed-Megaloblastic anaemia. Folate deficiency during pregnancy causes neural tube disorders of the foetus. Folate deficiency impairs the ability of the immune system to fight infection.

13. What are the effects of Vitamin B12 (Cyanocobalamin) Deficiency?
Ans: Pernicious amaemia is the major problem arising from an inadequate amount of vitamin B12. Pernicious amaemia is a condition characterized by very large, immature red blood cells with normal amounts of haemoglobin. Most deficiency signs and symptoms are of neurologic and hematologic origin; some signs and symptoms include skin pallor, fatigue, shortness of breath, palpitations, insomnia, tingling and numbness (paresthesia) in extremities, abnormal gait, loss of concentration, memory loss, disorientation, swelling of myelinated fibers, and possibly dementia. Neurological problems occur in about 75% to 90% of deficient people.

14. Discuss about the symptoms of Wet beriberi
Ans In Wet beriberi, there is enlargement of heart and the cardiac output is high. Oedema or accumulation of fluid in legs, face and trunk is observed. Palpitations are marked.

15. Discuss about Dry beriberi.
Ans: Dry beriberi is found predominantly in older adults. Deficiency is of result from a chronic low thiamin intake, especially if coupled with a high carbohydrate intake. Dry beriberi is characterized by muscle weakness and wasting, loss of appetite, tingling numbness and burning sensation in hands and feet. Calf muscles will become tender. Knee and ankle jerks will be sluggish. In later stages complete loss of sensation in hands and legs will occur. It is characterized by foot and waist drop. Mental depression and confusion occurs.