

Fat Soluble Vitamins: Vitamins A, D, E, and K

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Introduction

Fats are the body's most concentrated source of energy (37 kJ/g). They also help to absorb fat-soluble vitamins such as A, D, E, and K, as well as other fat-soluble biologically active components. Because they are soluble in organic solvents and are absorbed and transported in a way comparable to fats, vitamins A, D, E, and K are known as fat-soluble vitamins. Vision, bone health, immunological function, and coagulation are just a few of the physiological processes that fat-soluble vitamins play a part in. The biochemistry, transport, and functions of these vitamins are discussed in this review, with a focus on deficient disorders and potential toxicities. They absorb in the lymph, are transported in the circulation via carrier proteins, and can be stored in the liver and fatty tissues since they are fat soluble.

Vitamin A

Vitamin A deficiency can cause nyctalopia (night blindness) and keratomalacia, the latter leading to permanent blindness if not treated. It is the leading cause of preventable childhood blindness. Oversupplementation, wild game liver eating, and isotretinoin therapy are the most common causes of vitamin-A toxicity. Intracranial swelling caused by hypervitaminosis A causes headaches, papilledema, and seizures. Arthralgias, baldness, dry mucous membranes, skin desquamation, hypercalcemia, and liver impairment are among the other symptoms. Because of the risk of spontaneous abortion and birth abnormalities in the foetus, isotretinoin acid, an acne therapy, is contraindicated in women who are pregnant or may become pregnant.

Vitamin D

Vitamin D deficiency is common. Most foods do not contain vitamin D, indicating that a deficiency will occur unless people get sunlight

exposure or eat manufactured foods purposely fortified with vitamin D. Although rare, vitamin-D toxicity can occur in people who take a lot of vitamin-D supplements and eat a lot of fortified foods. Hypercalcemia produced by increased calcium absorption in the duodenum and distal convoluted tubule causes the bulk of hypervitaminosis D symptoms. Gastrointestinal difficulties such as decreased appetite, diarrhoea, nausea, vomiting, and constipation are common clinical symptoms. Polyuria, polydipsia, pruritus, and the formation of kidney stones are all symptoms of hypercalcemia. Pain in the bones, muscles, and joints are other typical symptoms.

Vitamin E

Vitamin E deficiency is rare, occurring as a consequence of abnormalities in dietary fat absorption or metabolism, such as a defect in the alpha-tocopherol transport protein, rather than from a diet low in vitamin E.

Vitamin K

Vitamin K deficiency as a consequence of low dietary intake is rare. A deficient state can be a result of fat malabsorption diseases. Signs and symptoms can include sensitivity to bruising, bleeding gums, nosebleeds, and heavy menstrual bleeding in women.

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