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THE ROLE OF VITAMINS IN HUMAN HEALTH

Murtazayeva Xadicha Nuriddinova
Teacher of Termez branch of Tashkent medical academy
Abrayqulova Ruxshona Zafar qizi
The 1 st year student of Termez branch of Tashkent medical academy

Annotation: This article examines the importance of vitamins for human health, their biological functions and their role in the body. The negative consequences of a deficiency of various vitamins and methods of their elimination are analyzed. Recommendations are also given on the sources of vitamins, the amount of daily needs and their correct use. The article includes measures to prevent and treat vitamin deficiency-related diseases and focuses on the role of vitamins in a healthy lifestyle.

Keywords: Vitamins, vitamin deficiency, vitamin A B C D, healthy lifestyle, nutrient sources, daily vitamin intake, vitamin-rich foods, rickets, osteomalacia, immune system.

Introduction

Vitamins are biologically active substances that are important for the normal functioning of the human body and for a healthy life. Vitamins are biologically active substances necessary for the normal functioning of the body. Vitamins (lot. vita-Amine of life and Amine, amines of life) are high - molecular compounds that perform very important biochemical and physiological functions in a living organism. Vitamins are expressed through the Latin alphabet A, B, C, D, E and other initials. The term ‘vitamins’ was introduced by Polish scientist K. Funk in 1912, based on the earlier studies of Russian scientist N.I. Lunin. They regulate the processes of metabolism, ensure the restoration of cells, play an important role in strengthening immunity and protecting the body from the harmful effects of the external environment. Vitamins enhance the chemical reactions that occur in the body and affect nutrient uptake. Enzymes are involved in the regulation of their function by entering the structure.

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Vitamins are needed by the body in very small quantities and are not synthesized or very poorly synthesized in the body.

Biological functions: Vitamins are important organic compounds that regulate biochemical processes in the body. Each of them performs its own biological functions in the body. Below is a detailed description of the biological functions of the main vitamins: 1. Vitamin A (Retinol) Biological functions:

Synthesizes the rhodopsin pigment needed to absorb light in the retina of the eye, providing vision (especially in the dark). Maintains the health of the skin and mucous membranes, controls the regeneration processes in them. Strengthens the immune system and helps in the fight against infections. Supports fetal development and bone growth.

2. **Vitamin D (Calciferol) Biological functions:**

Controls the absorption of calcium and phosphorus in the intestine, which ensures the strength of bones and teeth. Normalizes the calcium content in the blood, which plays an important role in muscle contraction and the passage of nerve impulses. Participates in bone renewal and osteoporosis prevention.

3. **Vitamin C (Ascorbic Acid) Biological functions:**

Participates in collagen synthesis, which ensures the strength of the skin, blood vessels, pores and bones. As an antioxidant, it neutralizes free radicals and restores the activity of other antioxidants (such as vitamin E). Strengthens the immune system and improves the fight against infections. Increases the absorption of iron in the intestine and prevents anemia.

4. **B vitamins**

Vitamins in this group play an important role in the nervous system, energy metabolism and other processes:

B2 (Riboflavin): helps in energy production and promotes cell growth. B6 (Pyridoxine): participates in the synthesis of proteins and neurotransmitters, supports the circulatory system B12 (cobalamin): participates in the process of blood formation, protects nerve fibers and promotes DNA synthesis.

Vitamin deficiency

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Deficiency of vitamins (hypovitaminosis or avitaminosis) causes problems in various biological processes and functions in the body. These problems cause various diseases and conditions. The following is an extensive and accurate overview of diseases and symptoms caused by vitamin deficiency:

1. Vitamin A (Retinol) deficiency

Vitamin A is necessary for Vision, growth, immunity and cell renewal.

Diseases and consequences:

Night blindness (Nyctalopia): this disease is a decrease in vision at night or in the dark. The most common cause of night blindness is a lack of vitamin A. Xerophthalmia: build up in the pupil and mucous membrane of the eye, which can lead to further deterioration of vision. In severe cases, complete eyesight is observed. Chorate (keratomalation): the mucous membrane of the eye dries out completely and ulcers appear. Skin changes: dry, itchy, reddening or scarring of the skin. Weakened immune system: Vitamin A deficiency reduces the body's ability to fight infections. In particular, it leads to respiratory infections, flu and lung inflammation. Growth delay: growth and development in children slows down, including bone formation.

2. Vitamin D (Calciferol) deficiency

Vitamin D is needed to absorb calcium and phosphorus and maintain bone strength.

Diseases and consequences:

Rickets: Vitamin D deficiency causes softening and deformation of bones in children. In children with rickets, the bones bend and deform (e.g. flexion of the bones of the feet).

Osteomalacia: softening and weakening of bones in adults, they break easily. This condition is similar to osteoporosis, but the bones are not completely mineralized.

• Osteoporosis: reduced bone density, mild bone fractures and joint problems occur. It often occurs in women in menopause and old age. Muscle weakness and pain: Vitamin D deficiency can lead to muscle weakness and pain.

3. Vitamin C (Ascorbic acid) deficiency

Vitamin C supports collagen synthesis and provides the body with antioxidant protection.

Diseases and consequences:

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• Scurvy: Vitamin C deficiency leads to bleeding of the gums of a child or adult, blood clots in the skin, kissing teeth and general fatigue. In scurvy, the skin and internal organs are often inflamed. • Decreased immunity: Vitamin C is important for the immune system, and its deficiency reduces the body's chances of fighting infections. Slow healing of wounds and lesions: collagen development slows down, which leads to a long duration of wounds and scars.

4. Lack of B vitamins

B vitamins, especially B1 (thiamine), B2 (Riboflavin), B3 (niacin), B6 (Pyridoxine), B9 (folic acid), and B12 (cobalamin), are important for energy production and the nervous system.

Diseases and consequences:

Vitamin B6 (Pyridoxine) deficiency: problems in the nervous system and blood formation process (anemia and weakening of the nervous system). Vitamin B12 (cobalamin) deficiency: anemia (anemia) and damage to the nervous system (nerve damage). Vitamins play an important role in maintaining the normal functioning of the body. Their deficiency can cause many serious diseases in the body, so a balanced diet rich in vitamins is necessary.

About the daily needs of vitamins and their natural sources

I will tell you in detail below about the daily needs of vitamins and their natural sources. Vitamins are essential to support different biological processes and can be obtained through different foods.

1. Vitamin A (Retinol)

• Men: 900 micrograms (mcg) retinol activity (RAE , women: 700 mcg RAE Animal sources: liver, fish oil, dairy products (milk, cheese, yogurt). Plant sources: vegetables (sauerkraut, carrots, broccoli), green leafy vegetables (spinach, Calia), yellow and red vegetables (cabbage, pepper).

2. Vitamin D (Calciferol) Daily need:

• Men and women (ages 19-70): 600 IU(15 mcg

Animal sources: fish (salmon, macarel), fish oil, liver, egg yolk, milk and dairy products. Plant sources: sunlight (vitamin D is synthesized in the body using sunlight), as well as vegetable fats and some fortified nutrients (soy milk, food).

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3. Vitamin C (Ascorbic Acid) Daily need:

- Men: 90 mg women: 75 mg

Plant sources: citrus fruits (orange, lemon, grapefruit), strawberries, kiwi, green and red peppers, broccoli, spinach, cabbage. Animal sources: Vitamin C is mainly derived from plants, but is also found in some foods (such as liver).

- 4. B vitamins

Vitamin B2 (Riboflavin)

- Daily need: men: 1.3 mg, women: 1.1 mg

* Sources • dairy products (milk, cheese, yogurt), meat, eggs, green leafy vegetables, cereals.

Vitamin B6 (Pyridoxine)

- Daily need: men: 1.3-2 mg, women: 1.3-2 mg

* Sources: meat, fish, legumes, cereals, potatoes, bananas.

Vitamin B12 (Cobalamin)

Daily need: men and women: 2.4 mcg

Sources: meat, fish, eggs, dairy products.

General recommendations: for vitamins, A balanced diet is necessary to meet daily needs. Vitamin-rich nutrients should be obtained from different food groups.The need for vitamins can vary depending on various factors (age, sex, physical activity, pregnancy and breastfeeding), so it is important to take into account nutritional needs.

Prevention measures:

1.Vitamin supplements: taking supplements as directed by a doctor if there is a vitamin deficiency.

2.Maintaining a healthy lifestyle: good sleep, physical activity, stress management, and proper nutrition help ensure the body's need for vitamins.

3.Health check: regularly check vitamin and mineral levels and identify existing deficiencies in the body. Note: If there are any deficiencies associated with vitamins and nutrients, it is necessary to consult a doctor.

Product	**Key vitamins**	**Retention in Raw Form**	**Retention in Fried Form**

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Tomatoes	C, A, K, E	Vitamin C is wellretained, A and E moderately	Vitamin C decreases, A and E remain stable
Cucumbers	C, K	Vitamin C is well-retained, K moderately	Vitamin C significantly decreases, K remains stable
Carrots	A(beta-carotene), K, B6	Beta-carotene is well-retained, K and B6 moderately	Beta-carotene becomes more bioavailable, B6 slightly decreases
Onions	C, B6	Vitamin C is wellretained, B6 moderately	Vitamin C significantly decreases, B6 partially retained
Greens	C, K, A	Vitamin C is well-retained, K moderately	Vitamin C decrease, K remains stable

The result of the study:

Natural (raw) consumption is the most effective way to preserve many vitamins, especially for vitamin C. But some vitamins (for example, betacarotene) are activated in heat, and in this case it is also useful to eat carrots in fried form. To prevent the reduction of vitamins at high temperatures, it is advisable to carry out the frying process for a short time and at low temperatures.

Conclusion

Vitamins are substances necessary for all systems of the human body. Adequate acceptance is an important condition for health and Prevention of various diseases. Along with taking vitamins through natural foods, it is possible to avoid problems caused by vitamin deficiency by following a healthy lifestyle and following the doctor's

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recommendations. Thus, the role of vitamins in human health is huge, and their timely intake is decisive in the fact that every person lives a comfortable life. In general, vitamins are vital nutrients necessary for the human body. Their intake in sufficient and balanced amounts is important not only to prevent disease, but also to improve overall health. And diseases caused by Vitamin deficiency can be easily avoided by treating at the right time and meeting nutritional needs. This helps maintain a healthy and active lifestyle throughout a person's life.

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