

**DEFICIENCY OF VITAMINS AND MINERALS
DURING THE PREGNANCY**

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Pregnant women have an increased risk of hypovitaminosis due to their increased vitamin requirements. Hypovitaminoses of C, B6, B1 and folic acid are the most common. When prescribing vitamins, it should be remembered that these drugs can cause adverse events, and some of them have a potential teratogenic effect. Vitamins in complex multivitamin-mineral complexes may enter into ambiguous interactions with their other components. The more complex the composition of a vitamin preparation, the more difficult is the absorption of each vitamin separately and the more difficult it is to assess the positive and negative mutual influences of all components of the complex [6,7,8,9].

Keywords: pregnancy, vitamins, multivitamin complexes.

Vitamins are exogenous substances, mostly not formed in the body. Some vitamins (folic acid, cyanocobalamin, pantothenic acid, vitamin K) can be synthesized by the bacterial flora of the intestine, but these amounts do not cover the body's need for them. An exception is vitamin D, which is synthesized in the skin under the influence of ultraviolet rays. Depletion of vitamin reserves in the body causes the development of diseases such as rickets, megaloblastic anemia, scurvy, pellagra, beriberi, xerophthalmia [3,4].

One of the causes of avitaminosis is insufficient vitamin intake from food. However, avitaminosis caused by malnutrition is mainly observed in countries with low economic levels. In developed countries, avitaminosis due to dietary deficiencies has become rare. People living below the poverty line and people who restrict their diets for various reasons, such as dieting, anorexia or alcoholism, are at risk of developing vitamin deficiencies due to low vitamin content. Vitamin deficiencies can develop even when the intake of vitamins from food is normal, as a result of the body's increased need for them. One of such conditions leading to relative vitamin deficiency is pregnancy. The need for vitamins during pregnancy increases approximately 1.5-2 times, which is due to the intensification of metabolic processes in the mother's body, as well as the use of part of the vitamins to meet the metabolic needs of the growing fetus. If vitamin deficiency (regardless of the reasons) reaches a critical level, the activity of enzymes, of which vitamins are a part, decreases. This entails biochemical and functional disorders that manifest themselves under stress. Complete depletion of

body reserves leads to damage to tissues and organs with the development of clinical symptoms of vitamin deficiency [9,10,11,12].

In practice, only folic acid and thiamine deficiency leads to the development of clinically pronounced avitaminosis in pregnant women. For other vitamins, we can speak of hypovitaminosis, a state of less profound deficiency. Since hypovitaminosis reflects a state of subclinical vitamin deficiency, it, unlike “classical” avitaminosis, is not accompanied by the development of specific clinical syndromes. Hypovitaminosis can manifest itself in the form of symptoms such as lack of appetite, fatigue, difficulty concentrating, irritability, apathy, sleep disorders. The nonspecificity of symptoms creates serious difficulties in establishing a diagnosis. Help in the diagnosis of hypovitaminosis can be provided by calculating the vitamin content in the diet of the pregnant woman. However, more reliable ways to confirm the presence of hypovitaminosis are to measure the concentration of a vitamin or its metabolite in biological fluids and tissues or to assess the activity of enzymes involved in vitamin metabolism. In everyday practice, laboratory tests are too expensive to perform, and calculating the intake of vitamins from food is too complicated, so vitamins are prescribed for prophylaxis without proving their deficiency [1,2,3].

The basis for prevention is statistical data on the insufficient intake of vitamins from modern foods, their low content in the body of pregnant women and the perception of increased vitamin consumption during pregnancy. The need for vitamins depends on age, sex, labor, living conditions, daily physical activity, climatic conditions, physiological state of the organism, composition and value of the diet and many other factors. Therefore, daily vitamin requirements may vary considerably from country to country and from region to region [6,7,8].

The daily intake of vitamins corresponds to a level that satisfies the vitamin requirements of a healthy person with a probability of 95-97%. But a lower intake of vitamins will not necessarily cause a deficiency, although the long-term risk of vitamin deficiency increases in proportion to the degree of dietary deficiency. Because of the wide variation among individuals, it is difficult to predict the true vitamin requirements of an individual without a thorough assessment of his or her clinical and nutritional status. For prophylactic purposes, vitamins are used in doses close to the norms of daily requirement. In the existing vitamin deficiency, resulting from disease or chronic malnutrition, the consumption of vitamins in such doses can not always compensate for the deficiency. Therefore, for therapeutic purposes, vitamins are prescribed in doses that are 5-10 times higher than the daily requirement. Such drugs are used on the recommendation and under the supervision of a doctor. The inclusion of trace elements in vitamin preparations often violates the stability of the latter, since some trace elements are heavy metals that catalyze the destruction of a number of vitamins (retinol and its esters, riboflavin, pantothenic acid and its salts, pyridoxine hydrochloride,

ascorbic acid and its salts, folic acid, cholecalciferol, ergocalciferol, rutin) [3.4.5].

One of the options for solving the problem is the distribution of the daily dose of vitamins and mineral elements in different tablets based on information about their antagonism and synergism. When choosing a complex multivitamin preparation, it is important to evaluate not only its composition, balance and compliance of the content of components with the recommended daily allowance, but also the possibility of various interactions between its components [1.2].

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