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КОРРЕКЦИЯ АЛИМЕНТАРНОГО СТАТУСА БЕРЕМЕННЫХ ЖЕНЩИН С ПОМОЩЬЮ ОПТИМАЛЬНОГО СОЧЕТАНИЯ ГЕМОПОЭТИЧЕСКИХ МИКРОНУТРИЕНТОВ В РАЦИОНАХ ПИТАНИЯ

CORRECTION OF NUTRITIONAL STATE OF PREGNANT WOMEN USING OPTIMAL COMBINATION OF HEMATOPOIETIC MICRONUTRIENTS IN DIETS

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Аннотация

Нерациональное питание беременных женщин, характеризующееся существенным дефицитом в их рационе многих макро- и микронутриентов, приводит к неблагоприятным условиям внутриутробного развития и нарушению состояния здоровья новорожденных. В связи с этим в изучении алиментарного статуса беременных женщин исследование содержания железа, меди и ряда витаминов в их рационах питания занимает особое место. Целью настоящего исследования являлась возможность коррекции алиментарного статуса и снижения частоты железodefицитных состояний, в том числе и гиповитаминозов, беременных женщин с помощью оптимального сочетания гемопоэтических микроэлементов (железо, медь) и витаминов. Анализ пищевого статуса беременных женщин г. Орла и Орловской области в разные сроки гестации был произведен с помощью метода анкетирования и изучения индивидуальных дневников питания. Результаты, полученные в ходе исследования, подтвердили, что у большинства беременных женщин, особенно к концу гестационного периода, а также в зимне-весенний сезон, проявляются признаки латентного дефицита железа вследствие недостаточного потребления его с пищей. Указанный недостаток железа зачастую наблюдался на фоне нарушений в образе жизни (курения), а также низкой обеспеченности организма аскорбиновой кислотой и рядом других витаминов. В связи с выявленными нарушениями стала очевидной необходимость в коррекции алиментарного статуса беременных женщин, которая осуществлялась с помощью оптимального сочетания гемопоэтических микроэлементов и витаминов в разработанных нами рационах питания. После соблюдения рекомендаций беременными женщинами по коррекции питания анализируемые показатели пищевого статуса улучшились.

Ключевые слова: беременные женщины, алиментарный статус, витаминный статус, железodefицитные состояния, гемопоэтические микронутриенты.

Abstract

Improper feeding of pregnant women characterized by significant deficiency of many macro- and micronutrients in their diet leads to unfavorable conditions of intrauterine development and abnormality of health status of newborns. In this regard, the study of iron and copper content and a number of vitamins in pregnant women diets occupies a special place in the research of the nutritional state. The purpose of the research was the possibility of correction of nutritional state and reduction of the frequency of iron deficiency conditions of pregnant women, including hypovitaminosis, with the help of optimal combination of hematopoietic trace elements (iron, copper) and vitamins. Analysis of the nutritional state of pregnant women in Orel and the Orel region at different gestation periods were performed using the survey method and study of individual nutrition diaries. The results obtained during the study confirmed that most pregnant women show signs of latent iron deficiency especially towards the end of the gestational period, as well as in winter-spring season due to insufficient intake of iron with food. This lack of iron was often observed against the background of lifestyle disorders (smoking), as well as low provision of ascorbic acid and a number of other vitamins. In connection with the revealed violations, the necessity of correction of nutritional state of pregnant women became obvious. It was carried out with optimal combination of hematopoietic trace elements and vitamins in the diets developed by the authors. The analyzed indicators of nutritional state improved after the recommendations on nutrition correction were followed by pregnant women.

Key words: pregnant women, nutritional state, vitamin status, iron deficiency conditions, hematopoietic micronutrients.

The provision of the human body with nutrients is the most important indicator of the alimentary status, which is formed due to the proteins, fats, carbohydrates, vitamins, macro- and microelements that come with food. At present, there are questions regarding the need to diagnose the level of nutrients in the human body [2; eleven; 13; fifteen]. Monitoring of nutritional status is due to the development of personalized medicine and the development of individual diets that ensure the effectiveness of therapeutic and preventive measures [1; 3; 5; 7; 9; 12; fourteen; 16]. A special place in the study of nutritional status is occupied by the study of the content of iron and hematopoietic micronutrients (iron, copper and a number of vitamins) in the diets of pregnant women.

During pregnancy, iron metabolism disorders often occur, which is associated primarily with a high level of estrogen in a woman's body during gestational period, which inhibit the formation of red blood cells. Frequent complications of pregnancy with iron deficiency include the threat of miscarriage and premature birth, preeclampsia, chronic placental insufficiency, which is associated with chronic hypoxia and intrauterine growth retardation syndrome. Unfavorable conditions of intrauterine development caused by complicated course of pregnancy and childbirth, irrational nutrition of pregnant women, a significant deficiency in their diet of many nutrients, including iron, lead to a violation of the health of newborns. As modern medical and demographic studies show, iron deficiency is the most common form of nutritional deficiency in populations [8].

When studying the nutritional status of pregnant women, it is also worth considering the complex effect of many genetic factors, pathological layers of the social order (overstrain of the nervous system, stressful effects, learning environment, occupational diseases, alcohol, smoking) and a number of other environmental conditions that together determine antenatal and postnatal development of the fetus. The most important task in optimizing nutritional status is to reduce the negative impact of the above factors on the health of a pregnant woman and unborn child.

The aim of this study was the possibility of correcting the alimentary status and reducing the frequency of iron deficiency conditions, including hypovitaminosis, in pregnant women with the help of an optimal combination of hematopoietic microelements (iron, copper) and vitamins.

For the primary analysis of the nutritional status of pregnant women and the assessment of their nutritional status, actual nutrition was studied in detail. Analysis of the actual nutrition of pregnant women in the city of Orel and the Oryol region at different gestation periods was carried out using the questionnaire method and the study of individual nutrition diaries. The research materials were statistically processed using the Statistica - 6 package and MS Excel capabilities. The choice of statistical processing methods was determined by the nature of the distribution of the studied features and the type of data.

As a result of the research, it was found that the majority of pregnant women, especially towards the end of the gestational period, as well as in the winter-spring season, showed signs of latent iron deficiency due to insufficient intake of it with food. This lack of iron was often observed against the background of a low supply of ascorbic acid and a number of other vitamins to the body.

In addition, lifestyle disorders were found in a significant proportion of pregnant women: 36% of the surveyed continued to smoke during pregnancy. As is known, cyanides contained in cigarette smoke disrupt the metabolism of vitamins B6 and B12, which can lead to deficiency of these micronutrients [10]. It should be noted that women who smoke during gestation are more likely to be iron deficient than non-smokers. This fact was confirmed by our research: out of 53 women with identified iron deficiency conditions, 35 people (66%) continued to smoke during pregnancy.

In connection with the identified violations, the need to correct the nutritional status of pregnant women became obvious. It was assumed that the prevention of these deficiencies can be facilitated by the introduction of rational combinations of nutrients that provide the physiological needs of a pregnant woman and a growing fetus in nutrients and energy and, at the same time, have an antioxidant and stimulating hematopoiesis orientation [4]. The diets developed on the basis of the above data were rich in proteins, vitamins E, C, B vitamins, mineral salts, zinc, iron and copper.

The use of optimized diets was aimed at providing the body of the expectant mother with a balanced diet, taking into account the characteristics of metabolism at different stages of pregnancy. When substantiating the need of pregnant women for basic nutrients and the calorie content of the diets developed by us, indicators were used for pregnant women of the 1st and 2nd groups of labor intensity at the age of 18 to 29 years in accordance with the "Norms of physiological needs for energy and nutrients for various groups population of the Russian Federation" [6]. The basis for the choice of these indicators was the results of a survey and questioning of the examined women during pregnancy.

When compiling optimized diets, the features of the synergistic interaction of macro- and micronutrients in foods and dishes with antioxidant and antihypoxic properties were also taken into account. These properties are especially important when correcting the nutrition of women who continue to smoke during pregnancy in order to reduce the damaging factor of smoking itself and its consequences, including hypoxia and the risk of varying degrees of iron deficiency in women during gestation and subsequent lactation.

Sausage products, canned meat and fish, smoked meat and fish products were not recommended for pregnant and lactating women, as they cannot serve as good sources of complete animal proteins. At the same time, the above products are also sources of nitrites used as food additives, which, in combination with poor nutrition and smoking, can provoke hypoxia and, as a result, cause iron deficiency. The increased content of this group of products in the diets of pregnant women, which we found in the study of their actual nutrition, is an alarming fact. Simultaneously with this violation, monitoring of actual diets showed that during the entire period of pregnancy, the consumption of cottage cheese, fish, meat and eggs containing compounds with an antioxidant effect (cysteine, taurine) was at a low level.

In the diets recommended by us, mineral substances were present in sufficient quantities, which made it possible to compensate for the manifestations of hypoxia resulting from iron deficiency. These properties are mainly possessed by iron, zinc and copper, which are necessary for normal hematopoiesis and tissue respiration, and magnesium, which activates energy metabolism

enzymes and has a vasodilating effect. As sources of macro- and microelements, pectin, fiber, vitamins, especially ascorbic acid, fresh vegetables, fruits and berries were included in the recommended diets. Even with a normal pregnancy, women usually have reduced intestinal motility, so the diet should be enriched with dietary fiber. In addition to vegetables and fruits, wholemeal bread, natural unclarified juices with pulp, which have also been included in optimized diets, are good sources of dietary fiber.

In addition, fresh vegetables, fruits and berries rich in ascorbic acid (cabbage, citrus fruits, black currants, etc.) increase the absorption of iron from plant sources. With a high content of ascorbic acid in some plant foods, iron can be well absorbed from vegetarian dishes. The absorption of non-heme iron from plant foods can be improved by meat dishes (including fish dishes, liver and poultry dishes) when they are consumed together in one meal, as a result of which these dishes were also included in our recommended corrective nutrition. Fermented milk products, including those enriched with bifidus and lactobacilli, were present in the optimized diets of pregnant women. These products are designed to normalize the intestinal microflora, reduce the manifestation of autointoxication from the intestinal canal, which can also help prevent iron deficiency.

The diets recommended by us contained increased amounts of pyridoxine, cyanocobalamin, niacin, since these vitamins normalize the process of hematopoiesis in the mother and fetus, maintain a normal level of red blood cells, thereby preventing the occurrence of hypoxia. The need to increase the content of vitamins in the diet of pregnant women with iron deficiency is due not only to antihypoxic properties due to the activation of enzyme and coenzyme systems, but also to their participation in the correction of tissue respiration of biological oxidation, oxidative phosphorylation, as well as direct participation in the metabolism of basic nutrients.

The result of the correction of vitamin status and iron deficiency conditions with the help of optimized nutrition was an improvement (in some cases, significant) in the indicators of the provision of vitamins and iron to the body of women who used it from the 1st trimester of pregnancy. It was also found that the regular use of optimized diets by women during pregnancy contributed to a decrease in their level of hypovitaminosis conditions. Thus, compared with the control level, the content of ascorbic acid in the blood plasma of women who used the recommended diets throughout pregnancy increased by 2 times. Since vitamin C affects the absorption and transport of iron, an increase in its concentration in the blood plasma also contributed to an improvement in the indicators of iron supply to the body of pregnant women.

Thus, after following the recommendations by pregnant women on nutrition correction, the analyzed indicators of nutritional status improved. It can be concluded that the use of optimized diets by pregnant women containing the optimal combination of hematopoietic trace elements (iron, copper) and vitamins can reduce the incidence of iron deficiency, including hypovitaminosis.

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