



COMPARATIVE ANALYSIS OF CERTAIN MICROELEMENTS IN THE DAILY FOOD AND BLOOD SERUM OF BREASTFEEDING WOMEN IN RURAL CONDITION

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ABSTRACT

The article presents a comparative analysis of the amount of calcium, phosphorus, magnesium and iron in the daily diet of 18-29 and 30-39-year-old lactating women living in rural conditions of Kashkadarya region and their concentration in blood.

According to the results, the amount of calcium in the daily food of the 18-29-year-old group was 931.3 ± 106.0 g, phosphorus 1553.3 ± 118.2 g, magnesium 410.8 ± 24.0 g, iron 22.1 ± 1.3 g, in contrast 783.7 ± 73.8 g calcium, 1359.3 ± 101.6 g phosphorus, 366.2 ± 30.5 g magnesium and 19.3 ± 2.4 g iron for 30-39-year-old lactating women. The concentration of these minerals in the blood serum of the respondents was 3.28 ± 0.09 mmol/l (calcium), 1.32 ± 0.2 mmol/l (phosphorus), 0.73 ± 0.05 mmol/l (magnesium), 10.1 ± 0.3 mmol/l (iron) in 18-29 year olds, and 3.26 ± 0.1 mmol/l (calcium), 1.4 ± 0.1 mmol/l (phosphorus), 0.66 ± 0.05 mmol/l (magnesium), 9.3 ± 0.7 mmol/l (iron) in 30-39-year-old lactating women. When assessing the supply of lactating women with micronutrients, identifying and analyzing their above-mentioned indicators is of great scientific and practical importance.

Introduction. It is known that, the composition, quantity and quality of food consumed by lactating mothers affect the health of the mother and the composition of breast milk. Human milk is considered the most optimal food for the baby, and its quantity and quality indicators are the main factors in ensuring the normal development of the child morphologically and physiologically [1]. Mother's milk has excellent nutritional and immunological properties even when they are malnourished. When the mother's body does not get enough energy, the body uses its reserve substances to continue milk production. However, regular consumption of products with insufficient nutritional value causes a deficiency of some important substances in milk and in the mother body. This can lead to

stunting in height and weight, anemia, rickets, hypovitaminosis and various mental illnesses in children [2, 3, 4].

During lactation, the requirements of many vitamins and minerals of nursing mothers increase compared to pregnant women [3]. Calcium and phosphorus are examples of important mineral substances necessary for the body. It is known that calcium and phosphorus are biologically important in the normal morphological and physiological development of the skeletal system of the child. In recent years, due to calcium deficiency, rickets has become common among the population of Africa, tropical Asia and a number of other countries. Many scientific literatures recommend that women of reproductive age consume more calcium-rich products in their daily diet. In order to meet the demand for calcium, especially lactating women, it is recommended to additionally consume milk and fish products after every meal [2, 5, 7, 17]. During lactation, morphological, metabolic and hormonal changes occur in several tissues of the mother body. Because the main task of lactation is to control the production and secretion of milk by the mammary glands, and during this period, the necessary amount of minerals, including calcium, are taken from the minerals contained in the bones for normal milk production. For this reason, many women experience bone fragility during this period [8, 9].

Determining the concentration of mineral substances in the blood serum and studying nutritional deficiencies is important in the analysis of biochemical and physiological processes in tissues and cells. In particular, determining the amount of iron is useful in the diagnosis of hematological diseases, in the prevention of disorders related to iron metabolism in the body, and in the study of various levels of anemia. Also, the results of many scientific studies show that magnesium supply of the human body and the amount of magnesium in plasma are related to various metabolic diseases in the body [10, 11, 12].

Based on the above points, we can say that it is important to study the supply of nutrients to lactating women living in different regions of our country and to develop the necessary recommendations for maintaining the health of the mother and child. Therefore, during our observations, we aimed to determine the actual nutrition of lactating women living in Kashkadarya region and the concentration of some mineral substances in their blood serum.

Materials and methods. The study was conducted in the first 6 months of lactation of nursing mothers aged 18-29 and 30-39 living in the villages of Kashkadarya region.

A questionnaire-survey method was used to study the actual diet of nursing women. According to the questionnaire method, lactating women recorded all the food products they consumed during 1 week in a special questionnaire. The amount of some micronutrients in the products listed in the questionnaires was determined. The chemical composition of food products was calculated using special tables [13]. The Windows Microsoft Excel program was used for mathematical calculation and statistical processing of the data in the questionnaires. The obtained results were compared with relevant norms [14].

The concentration of calcium, phosphorus, magnesium and iron in the blood was determined by immunoenzyme analysis. Appropriate measurements were carried out with the help of a modern biochemical analyzer MINDRAY VA-88A. (WH-92109032. Manufacturer name SHINZHEN MINDRAY BIO-MEDICAL ELECTRONICS CO., LTD Mindray Building, Keji

12th Road South, High-Tech Industrial Park, Nshan, Shenzhen, 518057, P.R. China Shanghai International Holding Corp. GmbH (Europe) Eiffestrabe 80, 20537 Hamburg, Germany. Production time 23.02.2019).

Results and their analysis.

During the observations, the daily food lists of nursing mothers aged 18-29 and 30-39 were analyzed. In particular, the amount of some mineral substances (calcium, phosphorus, magnesium and iron) in their daily food was determined. The results of the study of the amount of mineral substances in the daily food of lactating women are presented in Table 1 below.

Table 1

The amount of some mineral substances in the daily diet of lactating women

Indicators	18-29 year olds		30-39 year olds	
	Result	Norm	Result	Norm
Ca (mg)	954,4±120,8	1500-2000	787,4±85,4	1500-2000
P (mg)	1563,4±131,9	1000	1353,3± 114,1	1000
Mg (mg)	409,5±27,7	300	366,1±31,5	300
Fe (mg)	21,3±1,6	27	19,2±2,4	27

As can be seen in the table above, the amount of calcium in the daily food of the respondents aged 18-29 years is less than the norm, and it is 954.4±120 mg on average, which is an average of 45.5% less compared to the norm. This is explained by the fact that the supply of phosphorus and magnesium of lactating women in this age group is on average 56.3 and 36.5% higher than the standard level, respectively. And their demand for iron was satisfied by 78.9%.

The average amount of calcium in the daily food of participants aged 30-39 is 787.4±85.4 mg, which indicates that they are supplied by 45.0% of the norm. It was noted that their supply with phosphorus and magnesium is equal to 135.3 and 122.0%, respectively, compared to the norm. The amount of iron in the daily diet of lactating mothers of this age group is 19.2±2.4 mg on average, and this result is explained by the fact that it is 28.9% less than the norm.

The obtained results show that the intake proportion of mineral substances contained in the daily diet of the respondents does not correspond to the norm. In particular, there is a serious deficiency in the provision of calcium element of the examinees in both age groups. When analyzing the food products taken by lactating women with their daily meals, milk and dairy products, as well as foods made from legumes such as beans and peas and products rich in iron element, were consumed in the daily diet relatively little. Therefore, it can be noted that the amount of calcium and iron in the daily diet of lactating women is less than the norm. In addition, it can be seen that the amount of phosphorus and magnesium in the daily diet is higher than the standard values due to the relatively high consumption of dough, pasta, various pastries and rice products by the respondents.

The results of the study of the concentration of certain mineral substances in the blood serum of lactating women are presented in Table 2 below.

Table 2

Concentration of some minerals in blood serum of lactating women

Indicators	18-29 year olds		30-39 year olds	
	Result	Norm	Result	Norm
Ca (mmol/l)	3,28 ± 0,09	2,1-2,6	3,26 ± 0,1	2,1-2,6
P (mmol/l)	1,3 ± 0,2	0,8-1,61	1,4 ± 0,1	0,8-1,61
Mg (mmol/l)	0,73 ± 0,05	0,66-1,07	0,64 ± 0,05	0,66-1,07
Fe (mmol/l)	10,1 ± 0,3	6,6-26	9,3 ± 0,7	6,6-26

As can be seen in Table 2 above, the concentration of Ca in the blood of 18-29-year-old participants is 3.28±0.09 mmol/l, which is an average of 26.1% higher than the upper limit of the norm and P is 19.2% lower than the upper limit of the norm, 62.5% more than the lower limit, and the average is 107.8% compared to the norm. Also, the concentration of Mg is 0.73±0.05 mmol/l, which is on average 10.6% more than the lower limit of the norm and Fe is 10.1±0.3 mmol/l, which is slightly more than the lower limit of the norm and 61.1% less than the upper limit of the norm, and compared to the norm.

The concentration of Ca among minerals in the blood serum of participants aged 30-39 years is on average 25.4% higher than the upper limit of the norm, the amount of P is 75% more than the lower limit of the norm, 13% less than the upper limit, and compared to the norm it is 116.1% on average, Mg is 3% less than the lower limit of normal, while Fe is slightly more than the lower limit of the norm and 64.2% less than the upper limit of the norm, with an average of 57.0% compared to the norm.

The obtained results show that, despite the fact that both age groups have a serious deficit in the supply of calcium and iron, the amount of calcium and iron in their blood plasma is above the norm (the norm is taken in common for lactating and non-lactating women) and within the norm, respectively.

Conclusion. In conclusion, we can say that the amount of some mineral substances (calcium, phosphorus, magnesium and iron) in the daily diet of 18-29 and 30-39-year-old lactating women living in rural conditions of Kashkadarya region, which is one of the southern

regions of our republic, differs from the norm. It was found that the amount of calcium and iron contained in the diet of the participants consisted of less than the standard level, and phosphorus and magnesium were more than the standard level. Among the mineral substances recorded in the blood serum of lactating women in the study, the concentration of calcium was higher than the norm in both age groups, the concentration of phosphorus and iron was at the normal level, in contrast, magnesium was at the normal level in 18-29-year-old lactating women, in 30-39-year-old women and it was found to be less than the norm.

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