

The Role of Micronutrients in The Nutrition of School Children

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Abstract. The article is devoted to the study of the actual nutrition of 1-4 graders living in rural areas. The number of micronutrients in the daily food of the respondents was determined and compared with the relevant standards.

According to the obtained results, it was found that the amount of some vitamins in the daily diet of the subjects is much less than the norm.

In the work, necessary recommendations are also given to eliminate the lack of micronutrients and its prevention.

Key words: vitamins, micronutrients, daily diet, prevention of micronutrients

Introduction. Numerous studies have shown that micronutrient deficiencies are common in almost all population groups.

The insufficient satisfaction of the demand for micronutrients, which is especially common in children and students, is a very worrying situation.

The development of children and adolescents is divided into several periods, and at each stage, the child's body requires the consumption of an appropriate amount of micronutrients.

The need for micronutrients is relatively high in 7-10-year-olds [4,5].

Sufficient supply of micronutrients to children and students at the age of rapid growth plays a special role in their normal growth and high level of mental and physical activity.

Micronutrients are directly involved in all biochemical and physiological processes in the body, and are considered one of the necessary components of these processes.

Although vitamins and minerals are taken in very small amounts, their importance for the body is immeasurable.

Inadequate satisfaction of the demand for one or another vitamin, microelement creates the basis for the emergence of scurvy, rickets, goiter, anemia, dermatitis and many other diseases in the body.

In a word, micronutrient deficiency derails all vital processes in the body [4,6].

In accordance with what was said, our state is carrying out a number of effective actions to prevent micronutrient deficiency among the population and eliminate the consequences of the lack of these substances.

In particular, the decisions No. 4887 adopted in 2020 "On additional measures to ensure healthy nutrition of the population" can be cited as a proof of our opinion. These official documents envisage further strengthening of the state policy on ensuring healthy nutrition and physical activity of the population, increasing the efficiency of the work carried out in the prevention of non-communicable diseases, forming and improving the culture of healthy nutrition and physical activity in every person [1-3].

Based on the above, we set ourselves the goal of studying the actual nutrition of children.

Research Objects And Methods

Observations were conducted among primary school students of general secondary schools No. 30 in Mirishkor village, Boyovut district, Sirdarya region, and No. 29 in Osmanabad village. The examinees consisted of 65 (7-10 years old) 1-4 graders. Observations and studies were carried out during the years 2022-2023, in the autumn, winter and spring seasons.

Research methods. The actual nutrition of 7-10-year-old children was studied using questionnaire-survey methods that allow to determine and evaluate the amount of micronutrients in their daily food intake [6].

The amount of micronutrients in the subjects' daily food was calculated on the basis of special tables with the chemical composition of food products [2].

The obtained results were statistically processed in Microsoft Excel and compared with relevant norms.

Results And Their Analysis

Our observations and studies have shown that there are a number of specific changes in the actual diet of the respondents.

Table 1 below shows the results of the subjects' vitamin intake status.

1-table

The amount of vitamins in the daily food of 7-10-year-old students (average result for autumn, winter, spring seasons)

№	Vitamins	norm	obtained result	difference	
				In numbers	In percent
1	Retinol (A), mg	0,5	0,38±0,1	-0,12mg	76
2	Calciferol (D), µg	5	1,33±0,14	-3,67µg	26,6
3	Ascorbic acid (S), mg	35	45,7±1,88	-10,7mg	130
4	Cyanocobalamin (V12), µg	1,8	1,9±0,09	+0,1µg	105

From the results presented in the table, it is known that the demand of primary school students for studied vitamins is not sufficiently met in some cases.

In particular, if the demand for vitamin A, i.e. retinol, was met by 76% (0.38±0.1 mg was taken instead of the usual 0.5 mg), the demand for vitamin D, i.e. calciferol, was met by only 26.6%. only (1.33±0.14 µg instead of the usual 5 µg).

Such a situation is particularly alarming, as the demand for calciferol is sharply lower than the normal level.

It is natural that such deficiency in 7-10 year old students has a negative impact on their growth and development, normal functioning of the body, mental and physical work ability, and health.

The seriousness of the problem is that the need for vitamin D, i.e. calciferol, was met at a very low level in all three seasons (25.2%, 32.6% and 22.4% in autumn, winter and spring seasons, respectively).

It can be concluded that there are very few products rich in calciferol in the daily diet of the subjects.

In fact, vitamin D is relatively rare in food. However, by consuming foods such as egg yolks, liver, fish products, cheese, and butter, the requirement for calciferol can be met as needed.

If the satisfaction of the demand for vitamin A, i.e. retinol, in the subjects is considered according to the seasons, a different situation is revealed.

That is, the demand for retinol was higher than the norm in the autumn season (108%), much less than the norm in the winter season (74%) and very less than the norm in the spring season (only 50%).

Therefore, the satisfaction of the demand for this vitamin among the respondents decreases or increases depending on the season.

Of course, this is also not a positive situation, that is, when organizing the normal diet of the subjects, it is necessary to take into account the specific characteristics of each season, to take measures to meet the demand for necessary nutrients with the help of products grown in that season.

In particular, in our republic, in early spring, there are opportunities to meet the demand for retinol using greens, various vegetables or products such as cream, butter, egg yolk, and liver. The amount of ascorbic acid (vitamin C) and cyanocobalamin (vitamin V12) in the students' daily food did not significantly deviate from the norm.

No sharp differences were observed in all three seasons. In the course of observation and research, along with vitamins, the amount of some mineral substances in the food of the subjects was also studied.

Table 2 below shows the results obtained for mineral substances.

2-table

The amount of mineral substances in the daily food of 7-10-year-old students (average result for autumn, winter, spring seasons)

№	Minerals	Norm	Obtained result	Difference	
				In numbers	In percent
1	Calcium (Ca), mg	1100	415±16,5	-685mg	37,7
2	Phosphorus (R), mg	1650	1226±41,8	-424mg	74,3
3	Iodine (J), µg	120	33,9±1,53	-86,1µg	28,3
4	Zinc (Zn), mg	10	6,4±0,66	-3,6mg	64

It is known from Table 2 that the students' requirement for mineral substances is very low.

The worst indicator is related to calcium and iodine elements. According to the average results of all three seasons, the demand for calcium was met by 37.7%, and the demand for iodine by 28.3%.

The satisfaction of calcium requirement is very low in all three seasons (39.5%, 30.2% and 43.5% in autumn, winter and spring seasons, respectively).

The fulfillment of the demand for element iodine looks even worse by seasons (30.6%, 24% and 30% in autumn, winter and spring seasons, respectively).

It is worth noting that the above observed changes in actual nutrition have a serious negative effect on the body of the examined subjects, especially of students of junior school age. For example, since calciferol from vitamins is involved in the control of calcium-phosphorus metabolism, its deficiency affects the activity of the musculoskeletal system and leads to rickets. It is important for students to use sunlight to prevent this condition.

Because under the influence of sunlight, the synthesis of calciferol in the skin accelerates, and in this way, the body's need for this vitamin can be adequately met.

And retinol (vitamin A) is involved in growth and development, night vision, maintaining the normal function of the skin.

Its deficiency has a negative effect on growth and development in children, lowers immunity, and causes scurvy.

This vitamin is found abundantly in spinach and carrots, as well as in carrots, parsley, spinach and other greens

Summary. The obtained results and their analysis allow us to conclude that there are very serious changes in the actual nutritional status of the subjects.

In particular, it is a matter of concern that the amount of vitamin calciferol, and the amount of calcium and iodine in the students' food is less than the norm in all three seasons.

This, in turn, negatively affects the normal functioning of the child's body, normal growth and development, the formation of the nervous system and musculoskeletal system, and causes various diseases in the body.

Similarly, deficiency of retinol (vitamin A), phosphorus and zinc from minerals also leads to a number of negative changes.

In order to prevent the aforementioned negative situations, it is of great practical importance to form and improve the culture of nutrition among the subjects, as well as to explain and promote healthy eating among students' parents, school management and teachers

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