

Proper Nutrition and Identifying Signs of Micronutrient Deficiencies in Children

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Abstract

Nutrition is one of the most important factors determining the health of the population. Proper nutrition ensures the growth and development of children, helps prevent diseases, prolong life, increase efficiency and creates conditions for adequate adaptation to the environment [2,3,4,15]. Micronutrients are found in the human body in extremely small quantities, but nevertheless play an important role in all biochemical processes. A lack of these substances can lead to catastrophic consequences for the child's body [6,7,16]. There are several types of micronutrients, each of which performs its own specific function. However, the main purpose of all components included in the groups is to protect the body from the adverse effects of the environment [1,12,13,14].

When considering the role of microelements in the processes of growth and development of a child, one cannot fail to mention the importance of such an element as iodine. According to WHO (World Health Organization), 30% of the world's population is at risk of developing iodine deficiency diseases. Iodine is actively involved in the development of a child's cognitive processes [8,9,17].

Many foods of plant and animal origin contain natural antioxidant micronutrients, but their quantity, and therefore the degree of impact on health, varies widely. The most well-known antioxidant micronutrients are vitamins A, C, E, and selenium. Zinc and alpha-lipoic acid, although they do not have a direct antioxidant effect, when entering the body, they are either actively involved in biochemical reactions that provide antioxidant protection, or are converted into compounds with a powerful antioxidant effect [7,18].

According to statistics, risk groups for micronutrient deficiency are children under 3 years old, preschoolers 5-7 years old, and adolescents 11-15 years old. Children who are frequently ill are a special risk group [4,5,19].

In subsequent periods of childhood, nutrition as the main source of vitamins and microelements should be balanced and rational, taking into account age-related needs. And the nutrient needs of children are much higher than those of adults. That is why, in addition to the basic diet, a mandatory supplement of vitamins and micronutrients is required [10,11,20].

Key words school-age children, nutritional status, micronutrients, overweight.

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Purpose of the work: to study the nutritional status of school-age children with excess body weight.

Materials and methods of research. 130 schoolchildren were divided into 2 age groups: children 8 years 6 months – primary school age (subgroup A) and children 14 years 6 months – middle school age (subgroup B). As a result of anthropometry, 1A (relatively healthy group) included children with height and body weight at the median level, or within ± 1 standard deviation (1SD) according to the standards of anthropometric indicators. Group 2A included children with an increase in weight and body mass index (BMI) in relation to age within $+2$ SD from the median according to the standards (children with excess body weight). The division of the middle school age group was carried out identically into 1B and 2B. Clinical signs of micronutrient deficiency were identified in students of groups 1A and 1B, respectively, 34.2% - 37.3%, while among representatives of groups 2A and 2B the figure was 51.3% - 53.7%. Clinical signs of micronutrient deficiency were noted both in the primary school age group and in the middle school age group. A diet that does not correspond to age characteristics was noted both among overweight schoolchildren and among schoolchildren with normal weight, respectively: (32.4% - 51.4%). Changes were also noted in a decrease in the frequency of meals (43.7% - 63.7%), breaks between meals of 5-8 hours or more (23.7% - 49.3%), skipping meals (29.3% - 33.3%), which leads to a decrease in the frequency of consumption of basic products and dishes and a decrease in the level of nutritional status. The correlation between dietary indicators and indicators of physical development of schoolchildren has been established.

Deficits in calorie intake were identified in 59.5-74.8% of students, protein intake - in 62.8-74.6%, fat intake - in 21.1-37.2%, vitamin C - in 89.5-96.3 %, vitamin B - in 47.3-52.5%, which is typical for insufficient nutritional status of children. A statistically significant correlation between the frequency of consumption of biologically valuable products and dishes and the prevalence of clinical signs of micronutrient deficiency in school-age children has been established.

Conclusions. Clinical signs of micronutrient deficiency were identified in 54% of primary and secondary school students, with a greater prevalence of signs in overweight children (51.3% - 53.7%). A diet that does not correspond to age characteristics was 39% more likely to be observed among overweight schoolchildren (32.4% - 51.4%). Nutrient deficiency was noted in both age groups with a more frequent occurrence in overweight children (36% - 57%). The use of biological testing methods for indicators of nutritional status, the inclusion of nutritional factors in the system of social and hygienic monitoring ensures the identification of signs of micronutrient deficiency at an early stage, allows timely development of proposals for nutrition correction, and objective assessment of the effectiveness and efficiency of the measures taken.

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