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EVALUATION OF CLINICAL INDICATORS IN ASSESSING THE SEVERITY OF ANEMIA IN CHILDREN OF THE ARAL SEA REGION (LITERATURE REVIEW)

Karakalpak Medicine institutes Laboratory science
1st year master's student, ***Satullaeva Aziza Nietulla qizi***
aziza.satullaeva@mail.ru
Republican multi-branch medical center named after U. Halmuratov
Head of Hematology Department, Ph.D.
Almaganbetova Ulbosyn Kartzhanova

Summary

Iron deficiency anemia clinical manifestations appear that are explained the development of anemic hypoxia, which in turn increases the metabolic changes and trophic disorders present in the body. Updated criteria allow for early diagnosis and treatment before the development of damage to internal organs.

Key words: Iron-deficiency anemia, diagnostics,trace element

Relevance. Anemia is a pathological condition characterized by a decrease in the number of red blood cells and hemoglobin per unit volume of blood [13]. Among all anemias in childhood, the most common; iron deficiency form of anemia and heoccupies a leading place among anemias in the general population, however, the prevalence of iron deficiency anemia (IDA) varies significantly depending on age and gender [6;12]. Before 6 months of age, IDA is extremely rare, with the exception of premature newborns, in which the risk of IDA increases significantly after doubling birth weight. The highest prevalence of IDA is observed in children aged 6 months to 3 years (1st incidence peak) and adolescent girls over 12 years of age (2nd incidence peak). The relevance of the problem of iron deficiency anemia is due to the impossibility of normal functioning of the human body under conditions of iron deficiency [3].

According to the World Health Organization (2020), almost 2 billion people in the world suffer from IDA and another 3.6 billion people have latent iron deficiency [4]. The frequency of iron deficiency in children averages 7.5% in schoolchildren and 30-60% in young children - during the period of the most intense processes of final differentiation of maturation tissues of various organs and systems of the formation of the central nervous system. Epidemiological studies conducted in various regions of Uzbekistan have shown that the detection of manifest iron deficiency in the form of IDA among the most vulnerable risk groups is impressive. At the same time, IDA is significantly common in risk groups in the regions of the Southern Aral Sea region,

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which is an area of environmental distress. IDA in Uzbekistan is found in 80% of pregnant women, 60% of women of fertile age and 57% of school-age children [1].

The importance of the problem is explained not only by the high prevalence of this disease, but also by the pronounced pathological changes occurring in the body. For the first time, the variety of clinical manifestations of iron deficiency anemia was described by the German physician Johann Lange back in 1554 using the example of a sick girl: “weakness, low mood, palpitations, and shortness of breath when climbing stairs.” In 1615, the definition of “chlorosis” appeared to describe the green tint of pallor of the skin [3].

One of the main tasks of hematopoiesis is to maintain a constant quantitative and qualitative composition of individual components and links of the blood system, which, accordingly, blood diseases can be considered as a violation of the law of cellular balance. Physiological mechanisms of adaptive restructuring of a child’s body in environmentally unfavorable conditions naturally lead to shifts in elemental homeostasis. A deficiency of one micronutrient can lead to an imbalance of other micronutrients [2].

With iron deficiency in the body, not only the supply of oxygen to tissues is disrupted, but also the activity of tissue respiration enzymes decreases, that is, almost all cells of the body suffer, which causes the “variegation” of clinical manifestations of iron deficiency. A decrease in the activity of a number of iron-containing enzyme systems (cytochromes, catalase, peroxidase) leads to disruption of cellular and tissue metabolism, a decrease in hemoglobin synthesis and saturation of erythrocytes with it. Anemic hypoxia develops, which in turn increases the metabolic changes and trophic disorders present in the body [7].

It should be especially emphasized that issues of timely diagnosis Zh D Aare most acute in pediatric practice. At the same time, the relevance of the problem of IDA in pediatrics is due not only to its widespread prevalence, but also to the significant adverse effect of iron deficiency on the health of children. It has been proven that IDA causes dysfunction of many organs and systems of the body. This is due to the fact that iron is part of many proteins (hemoglobin, myoglobin, cytochromes, iron sulfur proteins, oxidases, hydroxylases, superoxide dismutase, etc.) that ensure systemic and cellular aerobic metabolism and redox homeostasis of the body as a whole. Thus, cytochromes and iron sulfur proteins are necessary for electron transport, and hemoglobin is necessary for oxygen transport. In turn, iron-containing proteins such as oxidases, hydroxylases and superoxide dismutases provide an adequate level of redox reactions in the body [6]. It has been established that insufficient iron content in the body adversely affects metabolic processes, which leads to disruption of the functioning of various organs and systems. At the same time, it has been proven that progressive IDA is accompanied by anemia, impaired growth and development of

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children, in particular psychomotor development, changes in behavior, decreased intelligence, immune dysfunction and other pathological manifestations [9,11].

Recently, the problem of iron deficiency without anemic syndrome has begun to be given great independent importance, as evidence has emerged that clinically iron deficiency plays a role in the development of such conditions in children as Sleep disturbances and emotional lability occurred in approximately half of the children, regardless of age. The child's brain is very sensitive to iron deficiency and the identified behavioral disorders are caused primarily by sideropenia. Physical development was below average in 12 children [4,5].

Typical manifestations of sideropenia in children of the first three years of life were decreased and/or perverted appetite, tachycardia and functional systolic murmur, intestinal dyspepsia, muscle hypotonia, including hypotonia of the abdominal wall and diaphragm muscles [8].The latter led to a relatively low position of the liver and spleen and in some cases created a false impression of their enlargement. Most patients experienced dry skin, hair, fragility and hair loss, and less commonly, angular stomatitis and glossitis. Trophic changes in the gastrointestinal tract, skin, its appendages, as well as muscle weakness, including myocardial weakness, are caused by tissue iron deficiency, leading to metabolic disorders in cells [1].

A number of authors have shown that long-term iron deficiency in young children leads to slower motor development and impaired coordination, delayed speech development and scholastic achievements, psychological and behavioral disorders, and decreased physical activity [10].

Thus, the clinical manifestations of iron deficiency in young children are diverse and not specific. However, for timely diagnosis of iron deficiency, it is important to identify such clinical symptoms as dry skin, hair and their fragility, muscle weakness, systolic murmur, retardation in physical and mental development, which must be compared with hematological changes.

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