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INDICATORS OF IRON METABOLISM IN HEALTHY CHILDREN AND ADOLESCENTS

Abstract: *According to the World Health Organization (WHO), iron deficiency (J) is in first place among the 38 most common human diseases - it affects more than 3 billion people on Earth. The highest risk of developing DF, both latent (LV), and manifest (iron deficiency anemia - IDA) in children (especially the first two years of life) and women of reproductive age. According to S. Osendarp et al., in the world about 50% of preschool children and pregnant women have anemia. It has been established that at anemia rate of 20%, DJ exists in 50% of the population. With an anemia rate of 40% and higher, the entire population has different types of GI. According to studies by D. Subramanian et al., 9% of children in their first two years of life have IDA.*

Key words: *gland, metabolism, adolescence, anemia.*

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Introduction

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Iron deficiency conditions (IDC) still remain one of the most urgent health problems around the world due to their widespread prevalence, especially among infants, adolescents, menstruating women, who are high-risk groups for the development of iron deficiency (J). According to WHO data, every 5-6 inhabitants of our planet have a JV of one or another degree of severity [2,3,7].

In young children, the development of J is mainly associated with the alimentary factor[1,3,5], and in adolescents - with puberty spurt, reduced diets, chronic diseases, against the background of which menarche occurs in girls, menstrual function disorders are registered[2,7,8], while in young men there is a rapid increase in muscle mass .

Iron deficiency occurs as a result of a long-term negative balance of iron, the reasons for which are either its insufficient intake into the body, or its increased consumption, sometimes a combination of both reasons. Iron is an essential trace element inherent in all living things on earth, it participates in the implementation of the basic functions of life support. These are, first of all, the production of iron-containing molecules (hemoglobin, myoglobin, etc.) and the normal functioning of iron-dependent reactions (involved in the production of interleukins, T-killers, T-suppressors, metalloenzymes, maintaining the pro-oxidant-antioxidant balance, etc.). Iron reserves are a buffer that protects the body from the development of J in various adverse situations.

It becomes obvious that J has a systemic effect on the vital functions of the body, especially during critical periods of growth and mental development. In young children, this is manifested by a delay in psychomotor development (delayed speech skills, impaired movement coordination, changes in behavioral reactions, etc.), in adolescents; - impaired cognitive functions and mental abilities (decrease. memory, concentration of attention and motivation for learning, emotional lability, increased anxiety, etc.), in adults-a deterioration in the quality of life (insufficient vital activity and apathy, lack of motivation to achieve goals, low self-esteem, etc. It should be noted that in many even highly developed

countries, where the diet of nursing women contains a sufficient amount of iron, " 4-6% of infants still develop JD, among adolescent girls the frequency of IDD reaches 13-14%, among young men-3-4%. After treatment with ferropreparations (AF) and replenishment of the iron depot, the impaired functions are quickly restored, but in some children the consequences of J can persist for a long time and even for life. WHO attaches global importance to this problem and requires universal attention" and actions aimed at combating iron deficiency[2,6,8].

At the same time, in our country, despite the medical examination of the children's population and the widespread introduction of laboratory tests that assess the indicators of iron metabolism, many aspects of the pathogenesis, diagnosis, consequences and treatment possibilities of IDD remain insufficiently studied from the standpoint of modern science and practice. The role of iron metabolism disorders in infectious and inflammatory diseases (IVD) is not always clearly understood. From a clinical point of view, this seriously hinders the understanding of the essence of pathophysiological processes in IDA and anemia associated with IVD, hinders the development and implementation of evidence-based laboratory markers of J, hinders the development of modern protocols for the diagnosis, treatment and prevention of IDD.

The purpose of the study. The purpose of this work was to establish the age-related features of iron metabolism and the state of hematopoiesis factors in normal and pathological conditions, including the antenatal period, and to improve the laboratory and clinical diagnosis of its disorders to justify effective treatment methods and develop optimal schemes for the prevention of IDC at the present stage.

Materials and methods of research: A large clinical material was used to study the parameters of iron metabolism in more than 105 children and adolescents from different societies and it was confirmed that in infants, iron is primarily associated with the alimentary factor and the social status of the family.

Results of the study: In accordance with this goal, during the early human ontogenesis, the values were determined and the interaction of iron-containing and iron-regulating proteins and a number of other compounds reflecting iron metabolism was studied (alkaline and acidic isoforms of ferritin, iron, Tf, EPO, rTfR, vit. B12, folates, hepcidin); the levels of cytokines (TNF-a, IL-6) involved in the regulation of iron metabolism were measured.

The examined fetuses and newborn children, depending on the gestational age (GW), were divided into groups, in each of which the values of the studied indicators were determined: in fetuses 5-10 weeks (groups 1 and 2) - in total in all tissues, in fetuses 11-15 weeks (group 3) -separately in liver and spleen tissues, in developing fetuses 26-35 weeks (groups 4 and 5), as well as in newborn children 35-41 weeks (groups 6 and 7) - in umbilical cord blood. The regularities of the formation of iron metabolism in early human ontogenesis associated with the gestational age of the fetus are established, as evidenced by a significant correlation of GW with the level of iron (g=0.9398, p<0.001), alkaline phosphatase (g=0.9597, p<0.0001), rTfR (g-0.9293, p<0.0001), hepsidin (g=0.8183, p<0.001), EPO (g=0.8889, p<0.0001), FE (g=0.8889, p<0.0001), 0.9297, p < 0.0001).

The participation of iron - containing and iron-regulating proteins in maintaining high activity of proliferative and plastic processes is confirmed by close relationships between the content of iron and alkaline phosphatase (g= -0.894, p<0.0001), alkaline phosphatase and rTfR (1=0.8399, p<0.0001), alkaline phosphatase and EPO (g=0.9193, p<0.0001), iron and hepsidin (g=0.8897, p<0.001), PE and EPO (g=0.9067, p<0.0001), which makes it possible to use the indicators of alkaline phosphatase, rTfR and hepcidin as important prognostic markers of intrauterine development disorders, and EPO and EF- to assess the degree of hypoxia.

It was found that the highest pro-inflammatory pattern of cytokines (IL-6 and TNF-a) is characteristic only for early embryogenesis (before the formation of the placenta), the further dynamics of their content during intrauterine development reflects a clear balance of the processes of alteration and apoptosis, as indicated by a reliable correlation between TNF-a and alkaline phosphatase (g=0.9197, p=0.00001), TNF-a and rTfR (g=0.8789, p<0.0001).

Conclusions: It was found that even simple dietary measures (exclusion of whole milk from the diet, inclusion of products rich in iron, their separate use with products that inhibit iron absorption) can reduce the incidence of IDA in young children by 1638%, the rehabilitation period of children and adolescents with IDA - in 80.7% of cases.

Reducing the frequency of IDD in children and adolescents is possible only with the joint work and efforts of pediatricians, parents, social services workers, which will allow timely prevention of JD in high-risk groups.

References:

1. Adamyan, J. B., Kulakov, I. I., & Andreeva, E. N. (2006). *Endometriosis*. (pp.124-135). Moscow: Medicine.
2. Afanasyev, I. B., & Korkina, L. G. (2000). *Diagnostic methods for determining oxidative stress. Method, recommendations*. Moscow: RSMU.
3. Baranov, A. A., Yakovleva, T. V., Albitsky, Yu., et al. (2008). Reduction of preventable health losses of the child population is a strategy of social pediatrics. *Vopr. modern pediatrics*., 7(4), 4-11.
4. Ardalan, V. R., Tubbs, R. S., & Shoja, M. M. (2007). The combined addition of vitamin E and selenium weakens oxidative stress in patients on hemodialysis receiving intradialysis iron infusion. *Nephrol transplantation for dialysis*, 22(3): 973-975.
5. Ballard, J. L., Kuri, J. K., Wedig, K., et al. (1991). Ballard's new assessment has expanded to include extremely premature babies. *J Pediatrics*,119: 417-423.
6. Ballin, A., Berar, M., Rubinstein, U., et al. (1992). The iron index in adolescent girls. *Am JDIS Child*, 146: 803-805.
7. Bannister, S.P., Bannister, W. H., & Rotilio, G. (1987). Aspects of the structure, function and application of superoxide diseases. *Clin Rev Biohem*, 22: 111-120.
8. Bartal, M., Mazor, D., Dvilansky, A., & Meierstein, N. (1993). Iron deficiency anemia: recovery after oxidative stress in vitro. *Aktagematol*, 90(2): 94-98.
9. Morgan, J. (1980). The pre-school child: diet, growth and obesity. *J Hum Nutr*, Vol. 34, No. 2, pp. 117-130, ISSN 0308-4329.
10. Kornienko, I.A. & Son'kin, V.D. (1999). “Biological Reliability,” Ontogeny, and Age-Related Dynamics of Muscular Efficiency. *Human Physiology*, Vol.25, No.1, pp.83-92, ISSN 0362-1197.