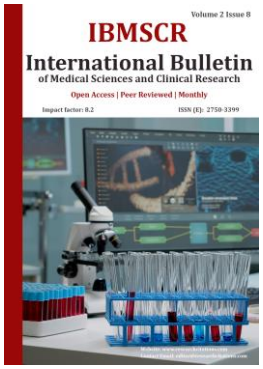

IRON DEFICIENCY ANEMIA IN CHILDREN, CAUSES AND PREVENTION MEASURES

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Abstract: This article discusses the causes and effects of iron deficiency in children. It contains information about the fact that anemia is mainly recorded in children, its causes and treatment measures.

Key words: anemia, syndrome, epithelial, hematology, dyspeptic, tachycardia

Iron deficiency anemia in children is a clinical and laboratory syndrome that develops with iron deficiency in the body due to an imbalance in the processes of its intake, absorption and consumption. Iron deficiency anemia in children is manifested by astheno-vegetative, epithelial, immunodeficiency, cardiovascular and other syndromes. The main laboratory criteria for diagnosing iron deficiency anemia in children are Hb concentration, color index, erythrocyte morphology, iron and ferritin content in blood serum. Treatment of iron deficiency anemia in children includes following a diet and regimen, taking iron supplements, and rarely, transfusion of red blood cells.

Iron deficiency anemia in children is a type of deficiency anemia, which is based on absolute or relative deficiency of iron in the body. The prevalence of iron deficiency anemia among children in the first 3 years of life is 40%; among teenagers – 30%; among women of reproductive age - 44%. Without exaggeration, we can state that iron deficiency anemia is the most common form that specialists in the field of pediatrics, obstetrics and gynecology, therapy, and hematology have to deal with.

During intrauterine development, iron enters the child's body from the mother through the placenta. The most enhanced transplacental transport of iron occurs in the period from 28 to 32 weeks of pregnancy. By the time of birth, the body of a full-term baby contains 300-400 mg of iron, while a premature baby contains only 100-200 mg. In a newborn, neonatal iron is consumed for the synthesis of Hb, enzymes, myoglobin, regeneration of the skin and mucous membranes, compensation of physiological losses through sweat, urine, feces, etc. The rapid growth and development of young children determines the body's increased need for iron. Meanwhile, increased consumption of iron from the depot leads to rapid depletion of its reserves: in full-term infants by the 5th–6th month of life, in premature infants by the 3rd month.

For normal development, the daily diet of a newborn should contain 1.5 mg of iron, and the diet of a child 1–3 years old should contain at least 10 mg. If the loss and consumption of iron exceeds its intake and absorption, the child develops iron deficiency anemia. Lack of iron and iron deficiency anemia in children contributes to hypoxia of organs and tissues, decreased immunity, increased infectious morbidity, and impaired neuropsychic development of the child. Antenatal and postnatal factors may be involved in the development of iron deficiency anemia in children.

Antenatal factors include the immaturity of the iron depot in the prenatal period. In this case, iron deficiency anemia usually develops in children under 1.5 years of age. The early development of anemia in a child can be facilitated by toxicosis, anemia of a pregnant woman, infectious diseases of a woman during gestation, threat of miscarriage, fetoplacental insufficiency, placental abruption, multiple pregnancy, premature or late ligation of the umbilical cord in a child. The most susceptible to the development of iron deficiency anemia are children born with a large birth weight, premature babies, and those with lymphatic-hypoplastic diathesis.

Postnatal iron deficiency anemia in children is associated with factors acting after the birth of the child, primarily insufficient intake of iron from food. Children who are bottle-fed with unadapted formula, goat's or cow's milk are at risk for developing iron deficiency anemia. Nutritional causes of iron deficiency anemia in children also include late introduction of complementary foods, lack of animal protein in the diet, unbalanced and irrational nutrition of a child at any age.

Iron deficiency anemia in children can be caused by external and internal bleeding (gastrointestinal, abdominal, pulmonary, nasal, traumatic), heavy menstruation in girls, etc. Iron deficiency accompanies diseases that occur with impaired absorption of microelements in the intestine: diseases Crohn's, ulcerative colitis, Hirschsprung's disease, enteritis, intestinal dysbiosis, cystic fibrosis, lactase deficiency, celiac disease, intestinal infections, giardiasis, etc.

Excessive iron loss is observed in children suffering from skin allergies and frequent infections. In addition, the cause of iron deficiency anemia in children may be a violation of iron transport due to a decrease in the content and insufficient activity of transferrin in the body.

The clinical picture of iron deficiency anemia in a child is nonspecific and can occur with a predominance of astheno-vegetative, epithelial, dyspeptic, cardiovascular, immunodeficiency, and hepatolienal syndrome. Astheno-vegetative manifestations in children with iron deficiency anemia are caused by hypoxia of organs and tissues, including the brain. In this case, muscular hypotonia, a child’s lag in physical and psychomotor development (in severe cases, intellectual failure), tearfulness, irritability, vegetative-vascular dystonia, dizziness, orthostatic collapse, fainting, and enuresis may be observed.

Epithelial syndrome in iron deficiency anemia in children is accompanied by changes in the skin and its appendages: dry skin, hyperkeratosis of the skin of the elbows and knees, the appearance of cracks in the oral mucosa (angular stomatitis), glossitis, cheilitis, dullness and active hair loss, brittleness and striation of nails.

Dyspeptic symptoms in iron deficiency anemia in children include decreased appetite, anorexia, dysphagia, constipation, flatulence, and diarrhea. Characteristic changes in the sense of smell (predilection for strong odors of gasoline, varnishes, paints) and taste (desire to eat chalk, earth, etc.). Damage to the gastrointestinal tract leads to disruption of iron absorption, which further aggravates iron deficiency anemia in children. Changes in the cardiovascular system occur with severe iron deficiency anemia in children and are characterized by tachycardia, shortness of breath, arterial hypotension, cardiac murmurs, and myocardial dystrophy. Immunodeficiency syndrome is characterized by prolonged unmotivated low-grade fever, frequent acute intestinal infections and acute respiratory viral infections, and severe and protracted infections.

Hepatolienal syndrome (hepatosplenomegaly) usually occurs in children suffering from severe iron deficiency anemia, rickets and anemia. Various specialists are involved in the diagnosis of iron deficiency anemia and its causes in children: neonatologist, pediatrician, hematologist, pediatric gastroenterologist, pediatric gynecologist, etc. When examining a child, attention is paid to the presence of pallor of the skin and visible mucous membranes (oral cavity, conjunctiva), acrocyanosis or perioral cyanosis , dark circles under the eyes.

The most important laboratory criteria that allow us to judge the presence and degree of iron deficiency anemia in children are: Hb (<110 g/l), CP (<0.86), serum iron (<14 μmol/l), total iron-binding capacity of serum (> 63), serum ferritin (<12 μg/l), etc. To establish the factors and causes associated with iron deficiency anemia in children, a bone marrow puncture may be required; FGDS, colonoscopy; Ultrasound of the abdominal organs, ultrasound of the pelvic organs; radiography of the stomach, irrigoscopy, stool examination for dysbacteriosis, occult blood, helminth eggs and protozoa.

The basic principles of treating iron deficiency anemia in children include: eliminating the causes of iron deficiency, correcting the regimen and diet, and prescribing iron supplements. The diet of children suffering from iron deficiency anemia should be enriched with foods rich in iron: liver, veal, beef, fish, egg yolk, legumes, buckwheat, oatmeal, spinach, peaches, apples, etc.

Elimination of iron deficiency in a child's body is achieved by taking iron-containing medications. For young children, it is convenient to prescribe iron supplements in the form of liquid dosage forms (drops, syrups, suspensions). Iron supplements should be taken 1-2 hours before meals, washed down with water or juices. Complex therapy of iron deficiency anemia in children must include vitamin and mineral complexes, adaptogens, and herbal infusions.

In case of severe iron deficiency anemia, children are given parenteral administration of iron supplements and red blood cell transfusions. The main course of treatment for iron deficiency anemia in children is usually 4-6 weeks, with maintenance for another 2-3 months. Simultaneously with the elimination of iron deficiency, it is necessary to treat the underlying disease. Adequate treatment and elimination of the causes of iron deficiency anemia in children leads to normalization of peripheral blood counts and complete recovery of the child. Children with chronic iron deficiency experience delayed physical and mental development and frequent infectious and somatic morbidity.

Antenatal prevention of iron deficiency anemia in children consists of the pregnant woman taking iron supplements or multivitamins, preventing and treating pregnancy pathologies, a balanced diet and the routine of the expectant mother. Postnatal prevention of iron deficiency anemia in children involves breastfeeding, timely introduction of necessary complementary foods, organization of proper care and regimen for the child.

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