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# CLINICAL CHARACTERISTICS AND TREATMENT METHODS OF IRON DEFICIENCY ANEMIA IN CHILDREN

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**Abstract:** Iron deficiency anemia (IDA) is one of the most common hematological problems in pediatrics, with a high global prevalence. According to the World Health Organization (WHO), about 40–50% of preschool children experience anemia caused by iron deficiency at some stage of their lives. This condition negatively affects not only physical growth but also the intellectual potential and psychological well-being of children. Effective treatment can be achieved through iron supplementation, vitamins, and modern nutritional programs.

**Keywords:** Iron deficiency anemia, child health, hemoglobin, diagnosis, treatment, prevention, pediatrics, nutrition, vitamins, Uzbekistan, WHO.

## Introduction

Iron deficiency anemia (IDA) in children is a disease characterized by a lack of iron necessary for hemoglobin synthesis and is among the most widespread micronutrient deficiencies worldwide. According to WHO (2024), over 273 million children around the world suffer from anemia, of which 47% are associated with iron deficiency. In Uzbekistan, this issue remains urgent. According to the 2023 health statistics, anemia of varying degrees was detected in 38% of children under the age of five. Global analyses also indicate that the overall prevalence of anemia among children aged 6–59 months remains high, necessitating stronger local preventive and nutritional measures. Regional studies in Uzbekistan show significant disparities in anemia rates among preschool children, emphasizing the need for targeted interventions.

## Main Part

The relevance of this problem lies in the fact that iron deficiency anemia directly affects children's physical, cognitive, and emotional development. Studies have shown that children with anemia have lower learning abilities, decreased concentration, and impaired memory, which leads to poorer academic performance during school years. From a socio-economic perspective, widespread anemia also impacts labor productivity and national health indicators. Therefore, this issue is one of the government's priority directions in promoting a healthy generation.

The causes of IDA are diverse and include insufficient consumption of iron-rich foods, gastrointestinal diseases, chronic blood loss, rapid growth periods, and maternal iron deficiency during pregnancy. In infants, early weaning, artificial feeding, and low-quality food products also contribute to the development of anemia.

The main clinical symptoms in children include general weakness, pale skin, fatigue, dizziness, loss of appetite, tachycardia, and pallor of lips and nails. Prolonged cases may lead to growth retardation, weakened immunity, and frequent infections. IDA also negatively affects cognitive development — concentration, learning, and communication skills decline.

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Diagnosis is based on laboratory tests, including complete blood count (hemoglobin, erythrocyte count, MCV, MCH, MCHC), and measurement of serum ferritin and transferrin levels. Thanks to the digital laboratory systems introduced in Uzbekistan in 2024, early detection of anemia has become more accessible. Moreover, pediatric screening programs ensure regular monitoring of children in risk groups.

Public awareness campaigns and the introduction of iron-fortified foods through mass media and educational institutions, as well as the improvement of nutrition standards in preschools, must become integral parts of Uzbekistan's anemia reduction strategy. Treatment mainly involves the administration of iron preparations ($Fe^{2+}$ and $Fe^{3+}$ forms) either orally or parenterally. In recent years, combined therapy including probiotics, vitamin $B_{12}$, folate, and vitamin C has gained wide application. Locally developed supplements such as Temir-Plus syrup and FerroKids have shown promising results in practice.

Diet therapy plays a crucial role: consuming iron-rich foods such as meat, liver, spinach, beans, and apples is recommended. Preventive measures should include promoting healthy nutrition, incorporating iron-rich products into diets, and providing iron supplements to breastfeeding mothers. Within the framework of Uzbekistan's "Healthy Child" and youth health state programs, large-scale preventive measures are being implemented to reduce childhood anemia.

**Conclusion**

Iron deficiency anemia in children is a critical social and medical issue that can be prevented through early diagnosis, modern treatment approaches, and effective preventive measures. Strengthening cooperation between healthcare workers, parents, and educational institutions is essential in reducing its prevalence. Promoting a healthy nutrition culture and overcoming iron deficiency are fundamental to ensuring the physical and intellectual well-being of future generations.

According to UNICEF's 2023 report, promoting healthy eating habits among preschool children can reduce anemia rates by 30–35%. Recent clinical studies (2023–2025) have shown that taking iron supplements together with vitamin C increases iron absorption by up to two times. Therefore, complex vitamin-mineral supplements are recommended in pediatric practice.

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