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**STRUCTURAL AND EPIDEMIOLOGICAL ANALYSIS OF IRON DEFICIENCY ANEMIA IN SCHOOLCHILDREN OF THE FERGANA VALLEY AND STRATIFICATION BY SEVERITY LEVELS**

**Nizom Jumakulovich Ermatov**

DSc, Professor Department of Hygiene of Children, Adolescents and Nutrition  
Tashkent State Medical University, Tashkent, Uzbekistan

**Mavlonjon Ziyomiddinovich Nasirdinov**

Head of the Department of Physiology and Pharmacology, PhD, Independent  
Researcher (DSc) Central Asian Medical University, Fergana, Uzbekistan

**Introduction.** Iron deficiency anemia (IDA) is the most prevalent micronutrient deficiency in the pediatric population, leading to impaired physical development, reduced cognitive performance, and decreased academic achievement. The distribution of disease severity among school-aged children reflects both the depth of the epidemiological process and the effectiveness of early diagnostic systems. In the Fergana Valley, characterized by high population density, the analysis of the structural indicators of IDA provides an important scientific basis for optimizing regional public health policy.

**Keywords:** Iron deficiency anemia, structural analysis, severity level, epidemiological stratification, schoolchildren, age and sex factors, public health.

**Study Objective.** To determine the structural distribution of iron deficiency anemia by severity levels among schoolchildren in the Fergana Valley and to statistically assess the epidemiological significance of age and sex factors.

**Materials and Methods.** The study was conducted using a cross-sectional epidemiological design. A total of 201 schoolchildren aged 8–17 years were examined. IDA was diagnosed in 101 children and classified into mild, moderate, and severe forms according to clinical criteria. The control group consisted of 100 healthy schoolchildren.

Disease severity was assessed based on hemoglobin levels and erythrocyte count in accordance with standard clinical criteria. Stratification was performed by age groups (7–10; 11–14; 15–17 years) and by sex.

Statistical analysis included the  $\chi^2$  test (for categorical variables), Odds Ratio (OR) with 95% confidence interval, and trend analysis across severity levels. A p-value <0.05 was considered statistically significant.

**Results.** Among schoolchildren diagnosed with IDA, the structural distribution of disease severity was as follows: mild – 25.7%, moderate – 67.3%, and severe – 6.9%. The predominance of the moderate severity level suggests a largely subclinical and chronic course of the disease.

Age-based analysis demonstrated a higher likelihood of IDA detection in the 11–14-year age group ( $p < 0.05$ ). Girls exhibited a significantly higher risk of moderate and severe IDA compared to boys, with sex emerging as an independent epidemiological determinant ( $OR > 1.5$ ;  $p < 0.05$ ).



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Although severe cases constituted a relatively small proportion, they were clinically significant and manifested with functional impairments such as fatigue, decreased academic performance, and difficulties in social adaptation.

**Discussion.** The findings indicate that IDA among schoolchildren in the Fergana Valley predominantly presents in the moderate form. This suggests either insufficient early detection or limited effectiveness of preventive measures. The identified age- and sex-related differences can be explained by increased biological and physiological demands. In particular, the sharp rise in iron requirements during adolescence contributes to higher morbidity rates.

The elevated risk observed in girls may be associated with reproductive and hormonal factors. The structural epidemiological model indicates that the high proportion of moderate cases increases the risk of progression to severe forms. This underscores the necessity of implementing early screening and differentiated preventive programs. Furthermore, the possibility of individual predisposition factors, including genetic determinants, contributing to the development of severe IDA cannot be excluded.

**Conclusion.** In schoolchildren of the Fergana Valley, iron deficiency anemia predominantly occurs in the moderate form and demonstrates statistically significant associations with age and sex factors. The obtained epidemiological findings highlight the need to strengthen regional screening programs and to develop differentiated preventive strategies.

