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ASSESSMENT OF THE RISK OF DISEASES ASSOCIATED WITH INTESTINAL MICROFLORA COMPOSITION AND IMMUNE SYSTEM IN EARLY CHILDHOOD

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Abstract: The composition of intestinal microflora in early childhood plays a crucial role in maintaining general health and regulating the immune system. When the balance of intestinal microbiota is disturbed, the body's defense mechanisms weaken, increasing the risk of allergic, inflammatory, and autoimmune diseases. This propedeutic observation examined the main components of intestinal microflora in children, their influence on the formation of immune response, and the clinical significance of dysbiosis. The results of the study highlight the importance of normalizing intestinal microflora and strengthening the immune system in early childhood to prevent diseases.

Keywords: intestinal microflora, immune system, dysbiosis, microbiota balance, propedeutic observation, allergic diseases, autoimmune diseases, Bifidobacterium, Lactobacillus, celiac disease, prevention, intestinal infections, parasitic diseases.

Introduction: The organism of young children undergoes an intensive development phase during which the composition of intestinal microflora and the formation of the immune system are closely interrelated. Intestinal microbiota plays a key role not only in digestion but also in shaping the body's defense mechanisms. Disruption of the microflora balance in children may lead to insufficient immune response formation, allergic reactions, chronic inflammation, and increased risk of autoimmune diseases. Therefore, propedeutic monitoring of intestinal microflora in early childhood, identifying its relationship with the immune system, and developing preventive measures remain among the urgent issues in medicine.

Main part: Research aimed at identifying the relationship between intestinal microflora and the immune system in young children revealed the following:

Microbiota composition and child health
A study conducted in the United States involving 412 children found that only 24% had normal microbiota. Among these children, those with Bifidobacterium deficiency were three times more likely to develop allergies, asthma, or eczema by the age of two compared to those with healthy microbiota. Analysis of intestinal microbiota in 1–11-month-old children (approximately 300 participants) showed that low levels of "high-risk" microbiota forms — such as Bifidobacterium, Akkermansia, and Faecalibacterium — were associated with later development of allergies and asthma.

Effect of intestinal microbiota on the immune system
Disturbance of microbiota balance can reduce the activity of T-regulatory cells and increase levels of signals promoting allergic reactions (e.g., interleukin-4). In a study involving 465 children, those with higher alpha-diversity in microbiota identified in stool samples at 6 weeks of

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age had a lower risk of developing infectious or respiratory diseases during the first year of life.

Preventive aspects and risk factors
Mode of delivery: In infants born via cesarean section, decreased diversity of intestinal microbiota and a 1.5–2.2-fold higher risk of developing allergic diseases were recorded.
Maternal antibiotic use: A multicenter study involving 45,575 vaginally delivered infants found that maternal antibiotic use during delivery altered neonatal microbiota, increasing the risk of immune-related diseases later in childhood.
Nutrition and breastfeeding: The mother's microbiota affects that of the infant. Breastfed infants were found to have higher concentrations of Bifidobacterium.

Findings from Uzbekistan (additional section)
Studies conducted in Uzbekistan indicate that disorders of intestinal microflora and immune-related diseases are widespread among young children. In a study of 179 children aged 2–7 years in the Khorezm region, intestinal infections were recorded in over 60% of cases, most of which involved disrupted microflora balance. Allergic diseases were found in 25–30% of children. Celiac disease symptoms were identified in 5.3% of cases. Among children in the Aral Sea region, environmental factors were frequently associated with weakened immunity and changes in intestinal microbiota. These findings underscore the need for preventive measures to maintain healthy intestinal microflora, detect parasitic and infectious diseases early, and strengthen the immune system in children.

Conclusion: The relationship between intestinal microflora composition and the immune system in early childhood plays a crucial role in healthy development. Studies show that disruption of microbiota balance significantly increases the risk of allergic, inflammatory, and autoimmune diseases due to inadequate immune response formation. Particularly, deficiency of beneficial bacteria such as Bifidobacterium and Lactobacillus increases susceptibility to infections and destabilizes immune balance. Therefore, propedeutic monitoring of intestinal microflora, promoting healthy nutrition, breastfeeding, cautious antibiotic use, and adherence to hygiene measures are essential from early childhood. Maintaining microbiota balance not only strengthens the immune system but also prevents chronic and autoimmune diseases later in life. Overall, establishing a healthy intestinal microflora forms the foundation for strong immunity, a healthy lifestyle, and long-term well-being in children.