MORPHOLOGICAL CHANGES OF THE NASAL MUCOSA IN CHILDREN WITH ALLERGIC RHINITIS

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Objective of the study. The aim of this study was to identify the characteristics of morphological changes occurring in the nasal mucosa of children with allergic rhinitis, to evaluate their relationship with the inflammatory process, and to scientifically substantiate the role of these changes in the pathogenesis of the disease.

Materials and methods. The study included 30 children aged 6 to 14 years diagnosed with allergic rhinitis (study group) and 15 conditionally healthy children (control group). Patient selection was based on clinical, anamnestic, and allergological examination data. The diagnosis of allergic rhinitis was confirmed by clinical symptoms (nasal obstruction, rhinorrhea, sneezing, itching), as well as by total serum IgE levels and skin allergy test results.

For morphological analysis, biopsy samples were obtained from the nasal mucosa. The collected tissues were processed using standard histological techniques, fixed in 10% neutral formalin, and embedded in paraffin blocks. Sections of 5–7 μm thickness were prepared using a microtome and stained with hematoxylin and eosin. The specimens were examined under a light microscope at ×100 and ×400 magnifications.

Morphological assessment included evaluation of epithelial integrity, degree of desquamation, number of goblet cells, hypertrophy of mucous glands, inflammatory cell infiltration in the stroma, and vascular condition. The quantity of eosinophils, lymphocytes, and mast cells was assessed using a semi-

quantitative method (mild, moderate, severe). In addition, the degree of mucosal edema was also determined.

Results. As a result of the conducted morphological study, significant structural changes in the nasal mucosa were identified in children with allergic rhinitis, which differed reliably from those in the control group ($p<0.05$). In particular, in the study group, disruption of epithelial integrity was observed, with frequent desquamation and dystrophic changes. A reduction in the number and functional activity of cilia in epithelial cells was detected, which led to impaired mucociliary clearance.

An increase in goblet cell number and hypertrophy of mucous glands resulted in enhanced secretory activity. These changes were clinically associated with the severity of rhinorrhea. In the stromal component, a marked increase in inflammatory cell infiltration, especially eosinophils, was observed. The number of eosinophils in the study group was several times higher than in the control group, and this difference was statistically significant ($p<0.05$).

In addition, an increase in lymphocytes and mast cells was also detected, confirming the activity of the allergic inflammatory process. Vasodilation and increased vascular permeability led to the development of mucosal edema. These morphological changes constitute the pathogenetic basis of nasal obstruction.

Overall, the obtained results demonstrated that structural remodeling of the nasal mucosa plays a crucial role in the development of allergic rhinitis in children and confirms the cellular mechanisms of the inflammatory process.

Conclusion. Thus, the results of the study confirmed that allergic rhinitis in children is accompanied by profound and multifaceted morphological changes in the nasal mucosa. The identified changes were characterized by disruption of epithelial integrity, desquamation, and decreased functional activity, as well as goblet cell hyperplasia, and hypertrophy and hypersecretion of mucous glands. These processes resulted in impaired mucociliary clearance,

which creates conditions for prolonged retention of allergens on the mucosal surface and contributes to chronicity of the inflammatory process.

In addition, a pronounced infiltration of eosinophils, lymphocytes, and mast cells in the mucosal stroma was observed, reflecting the cellular mechanisms of allergic inflammation. Biologically active mediators released by eosinophils further aggravate epithelial damage and intensify destructive tissue changes. Vasodilation and increased vascular permeability lead to mucosal edema, playing an important role in the pathogenesis of clinical manifestations, particularly nasal obstruction.

The identified morphological changes are closely associated with the severity and duration of allergic rhinitis, indicating that structural remodeling processes are essential in the course of the disease. From this perspective, assessment of the morphological state of the nasal mucosa is important not only for a deeper understanding of pathogenesis but also for early diagnosis, selection of individualized treatment strategies, and development of preventive measures.

Thus, morphological alterations observed in allergic rhinitis in children represent an integral pathogenetic component of the disease, and their comprehensive study provides opportunities to improve diagnostic and therapeutic approaches in clinical practice.