

BRONCHIAL EPITHELIAL REMODELING IN CHILDREN WITH BRONCHIECTASIS: MORPHOLOGICAL AND IMMUNOHISTOCHEMICAL FINDINGS

Sulaymanova Mariya Zholdasbay kzy

Samarkand State Medical University, Uzbekistan

Bronchiectasis in children is accompanied by persistent inflammation and structural remodeling of the bronchial wall. Epithelial injury and impaired differentiation of bronchial epithelial cells may contribute to the progression of chronic respiratory changes. Bronchiectasis in children is characterized by pronounced remodeling of the bronchial epithelium, including epithelial desquamation, loss of ciliated cells, basal-cell hyperplasia, and pathological regeneration. The CK5/6 $\uparrow$ /CK8/18 $\downarrow$ pattern reflects impaired epithelial maturation and formation of a functionally incomplete epithelial layer.

Keywords: bronchiectasis, children, bronchial epithelium, epithelial remodeling, epithelial differentiation, CK5/6, CK8/18, immunohistochemistry, morphology.

Background

Bronchiectasis in children is accompanied by persistent inflammation and structural remodeling of the bronchial wall. Epithelial injury and impaired differentiation of bronchial epithelial cells may contribute to the progression of chronic respiratory changes. Immunohistochemical assessment of epithelial markers provides additional information about the mechanisms of epithelial remodeling in bronchiectasis[1-3].

Objective

To characterize morphological changes and epithelial differentiation in the bronchi of children with bronchiectasis using histological and immunohistochemical methods.

Materials and Methods

The study included 53 children with bronchiectasis and 10 control cases. Surgical lung specimens obtained during lobectomy or segmentectomy were examined histologically and immunohistochemically. The morphological assessment focused on the condition of the bronchial epithelium, epithelial desquamation, ciliary cell loss, basal-cell hyperplasia, and regenerative changes. Immunohistochemical expression of CK5/6 and CK8/18 was evaluated to characterize basal and differentiated epithelial cell populations.

Results

Histological examination demonstrated pronounced structural remodeling of the bronchial epithelium in children with bronchiectasis. The epithelial lining showed focal desquamation, reduction or loss of ciliated cells, basal-layer hyperplasia, and pathological regenerative changes. These findings indicated disruption of the normal process of epithelial differentiation.

Immunohistochemical analysis demonstrated a marked imbalance in the expression of epithelial cytokeratins. CK5/6 expression increased by more than threefold, reflecting expansion of basal and poorly differentiated epithelial cells. In contrast, CK8/18 expression decreased approximately 1.5-fold, indicating a reduction in mature differentiated epithelial cells. Thus, the increased CK5/6 expression combined with decreased CK8/18 expression was associated with incomplete epithelial maturation and remodeling of the bronchial lining.

The identified morphological and immunohistochemical changes indicate that bronchiectasis in children is accompanied not only by inflammatory alterations but also by significant impairment of epithelial differentiation and regeneration.

Conclusion

Conclusion. Bronchiectasis in children is characterized by pronounced remodeling of the bronchial epithelium, including epithelial desquamation, loss of ciliated cells, basal-cell hyperplasia, and pathological regeneration. The CK5/6 $\uparrow$ /CK8/18 $\downarrow$ pattern reflects impaired epithelial maturation and formation of a functionally incomplete epithelial layer. Assessment of these markers may serve

as an additional morphological criterion for evaluating epithelial remodeling and the severity of pathological changes in pediatric bronchiectasis.

References

1. Khamidova F. M. et al. Structural components and immunohistochemical features of the respiratory organs in children with bronchiectasis //Reports of Morphology. – 2025. – T. 31. – №. 3. – C. 37-46.
2. Tiddens H. A. W. M. et al. Airway dimensions in bronchopulmonary dysplasia: implications for airflow obstruction //Pediatric pulmonology. – 2008. – T. 43. – №. 12. – C. 1206-1213.
3. Zhovliyeva M. B., Khamidova F. M. Morphological features of bronchial mucosa remodeling based on a model of bronchiectatic disease //Медицинский журнал молодых ученых. – 2024. – №. 12 (12). – C. 131-146.