“Tafakkur Academy Global Press”
nashriyoti



“Ilm-fan taraqqiyoti”
respublika ilmiy konferensiyasi

Tafakkurconference.uz

Smorphological alternations of the bronchopulmonary system under chronic exposure to nicotine-containing oral products

Boltaeva Z.F.

Bukhara State Medical Institute, Bukhara, Uzbekistan

Keywords. Nicotine intoxication, bronchial epithelium, lung tissue, morphology, emphysema, fibrosis

Relevance. The widespread use of nicotine-containing products remains a major global health concern. While the harmful effects of tobacco smoke are well established, the impact of nicotine-containing oral products on the respiratory system has not been sufficiently studied. Chronic exposure to such products may lead to progressive structural damage to bronchial and lung tissues, requiring detailed morphological investigation.

Aim of the study. To investigate morphological and morphometric changes in the bronchopulmonary system under chronic exposure to nicotine-containing oral products.

Materials and methods. The study was carried out on 120 white outbred rats of both sexes. The animals were divided into control and experimental groups. Chronic intoxication was modeled by daily administration of a nicotine-containing solution into the oral cavity. Morphological and morphometric analyses of bronchial and lung tissues were performed at different time intervals.

Results: Chronic exposure to nicotine-containing oral products resulted in progressive and stage-dependent structural alterations in the bronchopulmonary system. In the early stages, morphological changes were characterized by thickening of the serous membrane, initial deformation of the bronchial epithelium, and an increase in goblet cell activity, indicating a compensatory hypersecretory response. With continued exposure, more pronounced pathological changes developed. These included significant thickening of interalveolar septa, a decrease in alveolar density, and disruption of the normal spatial organization of the lung parenchyma. Structural changes in the bronchial wall were accompanied by epithelial desquamation, hyperplasia of mucus-producing cells, and alterations in the connective tissue framework. Vascular involvement became increasingly evident, with signs of vascular remodeling, thickening of vessel walls, and accumulation of perivascular collagen fibers, indicating the development of perivascular fibrosis. These alterations were associated with inflammatory cell infiltration, including macrophages and lymphocytes, reflecting the activation of chronic inflammatory processes in lung tissue. At advanced stages, destructive and irreversible changes predominated. These included the formation of emphysematous areas due to the destruction of interalveolar septa, expansion of air spaces, and a marked increase in fibrotic tissue components. The combined presence of emphysema and fibrosis reflected deep structural remodeling and loss of functional integrity of the lung tissue.

Conclusion. Chronic exposure to nicotine-containing oral products leads to progressive and stage-dependent morphological damage of the bronchopulmonary system, culminating in emphysema, fibrosis, and persistent structural remodeling of lung tissue.

Bibliography

1. Pashinyan G.A., Sorokina O.A. Morphological and morphometric characteristics of the bronchi in laboratory rats. // Bulletin of Human Morphology. - 2020. - Vol. 26, No. 1. - P. 81–88.

2. Nuraliyev N.A., Bektimirov A.M., Alimova M.G., Suvanov K.Zh. Rules and methods of working with laboratory animals in microbiological and immunological studies. - Method. manual. - Tashkent: Ministry of Health of the Republic of Uzbekistan, 2016. - 42 p.
3. World Health Organization. Global report on trends in prevalence of tobacco use 2000–2025. – Geneva: WHO, 2021.
4. Barnes P.J. Mechanisms of development of chronic obstructive pulmonary disease // American Journal of Respiratory and Critical Care Medicine. – 2016.