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THE CAUSES AND MECHANISMS OF DEVELOPMENT OF BRONCHIAL ASTHMA

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Annotation: This work explores the causes and development mechanisms of bronchial asthma, a chronic inflammatory disease of the respiratory system. It focuses on the interaction between genetic predisposition, immune system responses, and environmental factors such as allergens, air pollution, and infections. The study also describes the pathophysiological processes involved in airway inflammation, bronchial hyper responsiveness, and reversible airflow obstruction. Special attention is given to the role of inflammatory mediators and immune cells in disease progression. The research highlights the importance of early diagnosis, prevention strategies, and modern treatment approaches in controlling bronchial asthma and improving patients' quality of life.

Keywords: Bronchial asthma, chronic inflammation, respiratory system, allergens, immune response, airway obstruction, bronchial hyper reactivity, genetic predisposition, environmental factors, inflammatory mediators, pathogenesis, diagnosis, prevention, treatment.

Bronchial asthma is one of the most common chronic diseases of the respiratory system, affecting people of different ages across the world. It is characterized by inflammation of the airways, increased bronchial hyper responsiveness, and reversible airflow obstruction. Due to its chronic and recurrent nature, bronchial asthma represents a significant medical and public health problem, as it can considerably reduce the quality of life of patients and limit their daily activities. In recent decades, the prevalence of bronchial asthma has been increasing globally, which is closely associated with environmental changes, urbanization, and lifestyle factors. The disease is particularly common among children and young adults, although it can develop at any age. Its clinical manifestations, such as shortness of breath, wheezing, chest tightness, and persistent coughing, often worsen at night or early in the morning, leading to sleep disturbances and decreased physical performance.

The development of bronchial asthma is a complex process influenced by both genetic and environmental factors. Genetic predisposition plays an important role in determining individual susceptibility, while external factors such as allergens, air pollution, tobacco smoke, respiratory infections, and occupational exposures act as triggers for the onset and progression of the disease. These factors interact with the immune system, leading to chronic airway inflammation and structural changes in the bronchial wall. From a pathophysiological perspective, bronchial asthma involves a complex immune response in which various inflammatory cells, including mast cells, eosinophils, and T-lymphocytes, play a central role. The release of inflammatory mediators results in bronchoconstriction,



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mucus hypersecretion, and airway edema, which collectively contribute to airflow limitation and asthma symptoms.

The relevance of studying bronchial asthma lies in its increasing prevalence, long-term impact on health, and economic burden on healthcare systems. Understanding the causes and mechanisms of disease development is essential for improving diagnostic methods, developing effective treatment strategies, and implementing preventive measures. Therefore, this work aims to explore the causes and mechanisms of bronchial asthma development, highlighting the interaction between genetic, immunological, and environmental factors in the pathogenesis of the disease. Bronchial asthma is a chronic inflammatory disease of the respiratory system characterized by airway hyperresponsiveness and reversible airflow obstruction. The analysis of its development shows that the disease has a complex and multifactorial nature, involving genetic predisposition, immune system dysregulation, and environmental influences. Allergens, air pollution, respiratory infections, and various chemical irritants are considered the main triggering factors in the development and exacerbation of asthma. The pathogenesis of bronchial asthma is based on complex immunological mechanisms. When allergens enter the body, they are mistakenly recognized by the immune system as harmful agents, leading to the activation of immune cells and the release of inflammatory mediators such as histamine and leukotrienes. These substances cause contraction of bronchial smooth muscles, swelling of the airway mucosa, and increased mucus production, which ultimately leads to airway narrowing and breathing difficulties.

Clinically, bronchial asthma is characterized by recurrent episodes of shortness of breath, wheezing, chest tightness, and coughing. The severity of the disease varies from mild to severe forms, and in some cases, it can significantly reduce the patient's quality of life and physical performance. Therefore, early diagnosis, understanding of the disease mechanisms, and the application of modern treatment and preventive strategies are of great importance. Proper medical management, including pharmacological therapy and avoidance of triggering factors, plays a key role in controlling the disease and preventing complications.

In conclusion, bronchial asthma is a multifactorial chronic disease with a complex pathogenesis. However, with modern medical approaches, it can be effectively controlled, allowing patients to maintain a good quality of life. Prevention, early detection, and continuous management remain essential in reducing the global burden of this disease.

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