

MODERN APPROACHES TO THE TREATMENT OF BRONCHIAL ASTHMA

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Abstract

Bronchial asthma is one of the most common chronic diseases worldwide, affecting more than 100 million people. It occurs in all countries regardless of the level of economic development and represents a significant medical and social problem for both children and adults. Asthma may develop at any age, although it often begins in childhood. The prevalence of the disease is associated with environmental deterioration, exposure to allergens, infections, and genetic predisposition. Modern approaches to the treatment of bronchial asthma include pharmacological and non-pharmacological methods aimed at controlling inflammation of the airways and preventing exacerbations. The purpose of this article is to review the etiology of bronchial asthma and modern therapeutic strategies used for disease control.

Keywords: asthma, wheezing, genes, infections, allergens.

Introduction

Bronchial asthma (BA) is a chronic inflammatory disease of the respiratory tract involving many cells and cellular elements. Chronic inflammation leads to bronchial hyperreactivity, which causes recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing, especially at night or early in the morning. These episodes are usually associated with widespread but variable airway obstruction in the lungs, which is often reversible spontaneously or under the influence of treatment.

The disease affects millions of people worldwide and has a significant economic impact on healthcare systems. Therefore, improving diagnostic methods and treatment strategies remains one of the most important tasks of modern medicine.

Etiology of Bronchial Asthma

Both **internal** and **external factors** influence the development and manifestations of bronchial asthma.

Internal factors include: gender; obesity ; genetic predisposition

; genes associated with atopy and bronchial hyperreactivity

External factors include: allergens ; infections (mainly viral) ;occupational exposure; smoking ; air pollution ; nutrition



Among these factors, allergens play a key role in the development and progression of bronchial asthma. They sensitize the respiratory tract, trigger the onset of the disease, and maintain its course. Therefore, identification and elimination of allergens are essential components of successful treatment.

The most common household allergens are **house dust mites**, which are found in carpets, bedding, soft toys, and upholstered furniture. Asthma associated with dust mites is characterized by year-round exacerbations, with attacks occurring mainly at night.

Animal allergens such as fur, feathers, dander, saliva, and waste products of animals (cats, dogs, birds, rabbits, and others) are also widely распространены. Even after removal of animals from the home, allergen levels may remain elevated for several years.

Another important group of allergens includes **fungal allergens**, which cause sensitization to mold and yeast fungi. These microorganisms are commonly found in damp environments such as bathrooms and basements.

Pollen allergens are also significant triggers of asthma and may originate from trees, grasses, and weeds. Seasonal peaks of asthma exacerbations are often associated with the flowering periods of these plants.

Other factors that may contribute to asthma development include respiratory infections, environmental pollution, chemical substances, medications, and certain foods.

Smoking, including passive smoking, is one of the most powerful risk factors for asthma. Psychological stress and physical exertion may also provoke asthma attacks.

Therapy of Bronchial Asthma

Treatment of bronchial asthma is **comprehensive** and includes an anti-allergic regimen, pharmacological therapy, and non-pharmacological treatment. The choice of basic therapy depends on the level of asthma control.

Modern treatment strategies recommend a **stepwise approach**, in which therapy intensity increases as the severity of the disease increases. The aim of this approach is to achieve asthma control using the smallest effective number of medications.

Medications used for asthma treatment are divided into two main groups:

1. **Basic (controller) medications**
2. **Reliever medications used for exacerbations**

Inhaled Corticosteroids

Currently, the most effective medications for asthma control are **inhaled glucocorticosteroids (ICS)**. These drugs reduce airway inflammation and significantly decrease the frequency and severity of exacerbations.



Common inhaled corticosteroids include:

- beclomethasone dipropionate
- budesonide
- fluticasone propionate
- flunisolide
- triamcinolone acetonide
- mometasone furoate

ICS exert anti-inflammatory effects by suppressing inflammatory cells and mediators, reducing cytokine production, and decreasing vascular permeability in airway tissues.

An important property of these medications is **lipophilicity**, which allows them to accumulate in airway tissues and provide prolonged anti-inflammatory action with minimal systemic effects.

Combination Therapy

If asthma control remains insufficient, **long-acting β_2 -agonists (LABA)** are added to inhaled corticosteroids.

The most commonly used LABA medications include:

- salmeterol
- formoterol

Combination inhalers containing both ICS and LABA have become central to modern asthma therapy. These medications improve treatment adherence and provide better symptom control.

Examples include:

- **Seretide Multidisk** (salmeterol + fluticasone)
- **Symbicort Turbuhaler** (budesonide + formoterol)

Additional Pharmacological Treatment

Short-acting β_2 -agonists remain the primary drugs for rapid relief of acute asthma symptoms.

Other pharmacological options include:

- leukotriene receptor antagonists
- cromones
- anti-IgE therapy (omalizumab)
- systemic corticosteroids during severe exacerbations

Non-Pharmacological Treatment



Non-pharmacological therapy plays an important role in asthma management and includes:

- breathing exercises and respiratory therapy
- physical rehabilitation
- massage and physiotherapy
- speleotherapy and climate therapy
- acupuncture
- herbal therapy
- psychological support
- spa treatment

Patient education and self-monitoring are essential components of asthma control. Monitoring lung function using **peak flowmetry** allows early detection of exacerbations and timely adjustment of treatment.

Conclusion

Bronchial asthma is a widespread chronic disease requiring long-term management. Modern therapeutic strategies focus on controlling airway inflammation and preventing exacerbations through inhaled corticosteroids, combination therapy, and patient education. A stepwise approach to treatment allows physicians to achieve effective disease control while minimizing medication use and improving patients' quality of life.

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