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BRONCHIAL ASTHMA

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Abstract:

Bronchial asthma is a chronic inflammatory disease of the airways characterized by reversible airflow obstruction, bronchial hyperresponsiveness, and recurrent episodes of wheezing, breathlessness, chest tightness, and coughing. It is a major global health problem affecting individuals of all age groups. This article explores the underlying pathophysiology, clinical manifestations, triggering factors, diagnostic approaches, and modern management strategies of bronchial asthma.

Introduction:

Bronchial asthma is one of the most common chronic respiratory diseases worldwide. It involves inflammation and narrowing of the bronchial airways, leading to episodic airflow limitation. The condition can vary from mild intermittent symptoms to severe persistent disease affecting quality of life.

Asthma is influenced by genetic predisposition and environmental exposures such as allergens, pollution, and infections. Despite advances in treatment, poor disease control remains a challenge in many patients.

Pathophysiology: The Inflamed Airways

- Asthma is primarily an inflammatory disorder involving:
- Airway inflammation: Infiltration by eosinophils, mast cells, and T-lymphocytes
- Bronchoconstriction: Contraction of smooth muscles
- Mucus hypersecretion: Blocking airways
- Airway remodeling: Thickening of bronchial walls in chronic cases

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- These changes result in reversible airway obstruction and increased sensitivity to stimuli.

Triggers and Risk Factors

- Asthma symptoms can be triggered by:
- Allergens (dust, pollen, animal dander)
- Respiratory infections
- Cold air and exercise
- Air pollution and smoke
- Stress and emotions
- Certain drugs (e.g., aspirin, beta-blockers)

Risk factors include family history, atopy, and urban living conditions.

Clinical Features

- Typical symptoms include:
- Wheezing (whistling sound during breathing)
- Shortness of breath (dyspnea)
- Chest tightness
- Cough (often worse at night or early morning)

Symptoms are usually episodic and reversible, either spontaneously or with treatment.

Diagnosis

1. Diagnosis is based on:
2. Clinical history and symptoms
3. Physical examination (wheezing on auscultation)
4. Pulmonary function tests:
5. Spirometry showing reversible airflow obstruction
6. Peak expiratory flow rate (PEFR) monitoring
7. Allergy testing (in selected cases)

Classification of Asthma Severity

8. Asthma is classified as:
9. Intermittent
10. Mild persistent
11. Moderate persistent
12. Severe persistent
13. This classification helps guide treatment.

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Management Strategies

1. Avoidance of Triggers

Reduce exposure to allergens and irritants

2. Pharmacological Treatment

Reliever medications:

Short-acting β_2 agonists (e.g., salbutamol)

Controller medications:

Inhaled corticosteroids (first-line)

Long-acting β_2 agonists

Leukotriene receptor antagonists

Severe cases:

Oral corticosteroids

Biologic therapy (e.g., anti-IgE)

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3. Patient Education

Proper inhaler technique

Adherence to treatment

Action plan for acute attacks

Prognosis

With proper treatment, most patients achieve good control. However, untreated or poorly managed asthma can lead to significant morbidity.

Complications

- Status asthmaticus (life-threatening severe attack)
- Respiratory failure
- Airway remodeling in chronic cases

Conclusion

Bronchial asthma is a chronic but manageable disease. Understanding its inflammatory nature, identifying triggers, and adhering to appropriate therapy are key to effective control. Advances in pharmacological treatments and patient education continue to improve outcomes and quality of life for asthma patients.

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