Department of anesthesia

pharmacology

Lecture 4

RESPIRATORY DISORDERS

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THERAPY OF Respiratory Disorders.

- Asthma is a chronic inflammatory disease of the airways characterized by episodes of acute bronchoconstriction causing shortness of breath, cough, chest tightness, wheezing, and rapid respiration.
- Asthmatic cases was divided into two clasis:

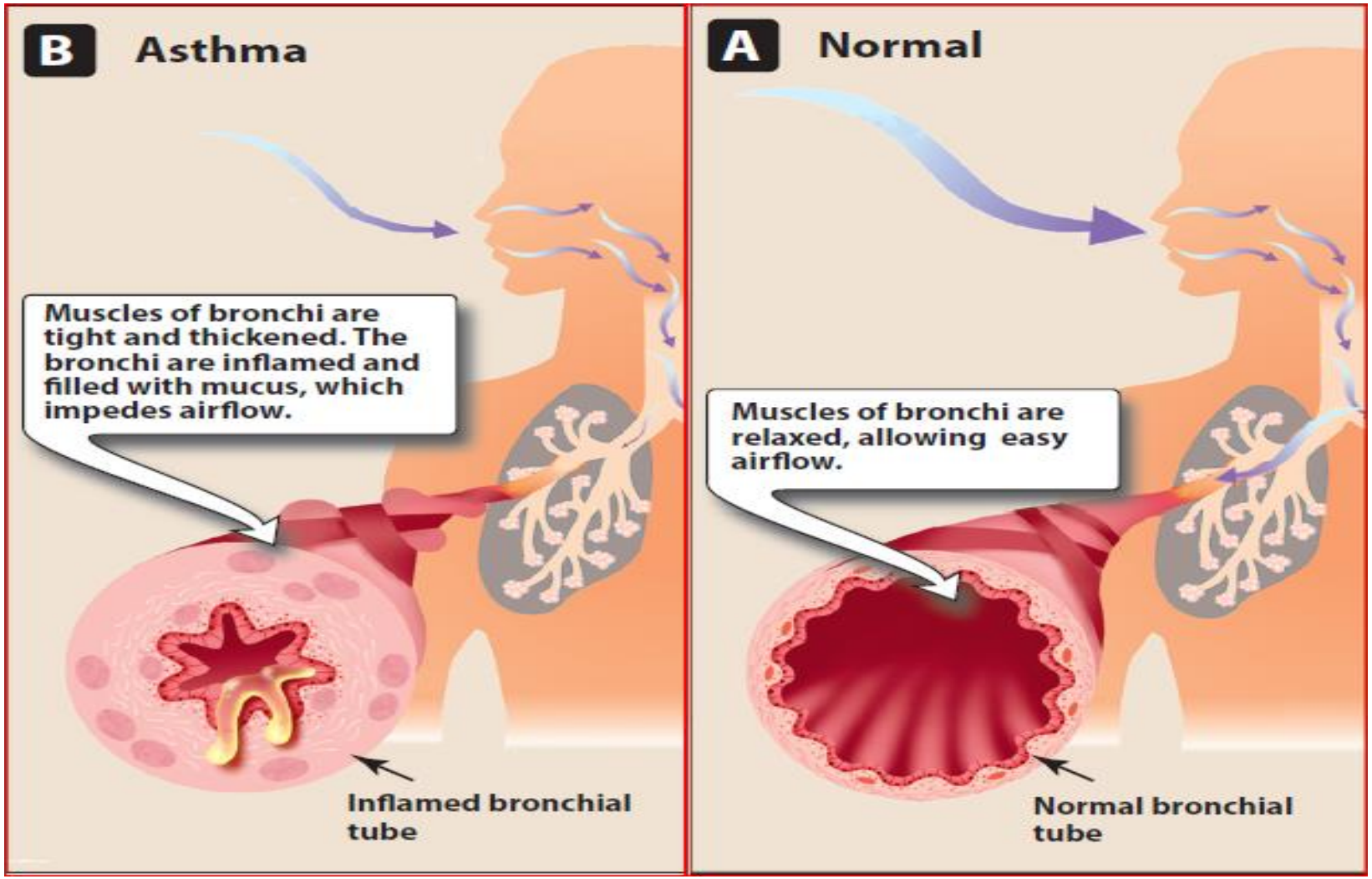
1.Acute asthmatic patients.

2. Chronic asthmatic patients.

Treatments:

Pathophysiology of asthma

Airflow obstruction in asthma is due to bronchoconstriction that results from contraction of bronchial smooth muscle, inflammation of the bronchial wall, and increased secretion of mucus, The underlying inflammation of the airways contributes to airway hyperresponsiveness, airflow limitation, respiratory symptoms, and disease chronicity. Asthma attacks may be triggered by exposure to allergens, exercise, stress, and respiratory infections. Unlike COPD, cystic fibrosis, and bronchiectasis, asthma is usually not a progressive disease (that is, it does not inevitably lead to incapacitated airways). However, if untreated, asthma may cause airway remodeling, resulting in increased severity and incidence of asthma exacerbations and/or death.


B
Asthma
Muscles of bronchi are tight and thickened. The bronchi are inflamed and filled with mucus, which impedes airflow.
Inflamed bronchial tube
A
Normal
Muscles of bronchi are relaxed, allowing easy airflow.
Normal bronchial tube

- **Goals of therapy**

The goals of asthma therapy are to decrease the intensity and frequency of asthma symptoms and the degree to which the patient is limited by these symptoms. All patients need to have a "quick-relief" medication to treat acute asthma symptoms. Drug therapy for long term control of asthma is designed to reverse and prevent airway inflammation.

- **Bronchodilators β2-Adrenergic agonists**

Inhaled β2-adrenergic agonists directly relax airway smooth muscle. They are used for the quick relief of asthma symptoms, as well as adjunctive therapy for long-term control of the disease.

1. Quick relief: Short-acting β2 agonists (SABAs) have a rapid onset of action (5 to 30 minutes) and provide relief for 4 to 6 hours. They are used for symptomatic treatment of bronchospasm, providing quick relief of acute bronchoconstriction. β2 agonists have no anti inflammatory effects, and they should never be used as the sole therapeutic agents for patients with persistent asthma, Adverse effects, such as tachycardia minimized with inhaled delivery versus systemic administration. These agents can cause β2-mediated skeletal muscle tremors.

2. Long-term control: Salmeterol and formoterol are long-acting β2 agonists and chemical analogs of albuterol. Salmeterol and formoterol have a long duration of action, providing bronchodilation for at least 12 hours. Neither salmeterol nor formoterol should be used for quick relief of an acute asthma attack. Use of LABA monotherapy is contraindicated, and LABAs should be used only in combination with an asthma controller medication. Inhaled corticosteroids (ICS) remain the long-term controllers of choice in asthma, and LABAs are considered to be useful adjunctive therapy for attaining asthma control. Some LABAs are available as a combination product with an ICS .Adverse effects of LABAs are similar to quick-relief β2 agonists.

Corticosteroids

Inhaled corticosteroids (ICS) are the drugs of choice for long-term control in patients with any degree of persistent asthma.

No other medications are as effectiveas ICS in the long-term control of asthma in children and adults. To be effective in controlling inflammation, glucocorticoids must be used regularly. Severe persistent asthma may require the addition of

a short course of oral glucocorticoid treatment.

ALTERNATIVE DRUGS USED TO TREAT ASTHMA:

1. Theophylline:

a.Theophylline is a bronchodilator that relieves airflow obstruction in chronic asthma and decreases its symptoms.

b. It may also possess anti-inflammatory activity.

c. Theophylline has been largely replaced with β2 agonists and corticosteroids due to its narrow therapeutic window, adverse effect profile, and potential for drug interactions. Overdose may cause seizures or potentially fatal arrhythmias.

2. Leukotriene modifiers (Montelukast):

a.approved for the prevention of asthma symptoms.

b. should not be used in situations where immediate bronchodilation is required.

c. Elevations in serum hepatic enzymes have occurred, requiring periodic monitoring and discontinuation when enzymes exceed three to five times the upper limit of normal.

DRUGS USED TO TREAT COUGH

- Coughing is an important defense mechanism of the respiratory system to irritants and is a common reason for patients to seek medical care. A troublesome cough may represent several etiologies, such as the common cold, sinusitis, and/or an underlying chronic respiratory disease. In somcases, cough may be an effective defense reflex against an underlying bacterial infection and should not be suppressed. Before treating cough, identification of its cause is important to ensure that antitussive treatment is appropriate. The priority should always be to treat the underlying cause of cough when possible.
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- **Opioids**

Codeine , an opioid, decreases the sensitivity of cough centers in the central nervous system to peripheral stimuli and decreases mucosal secretion. These therapeutic effects occur at doses lower than those required for analgesia. However, common side effects, such as constipation, dysphoria, and fatigue, still occur. In addition, it has addictive potential.
Dextromethorphan is a synthetic derivative of morphine that has no analgesic effects in antitussive doses. In low doses, it has a low addictive profile. However, it is apotential drug of abuse, since it may cause dysphoria at high doses. Dextromethorphan has a significantly safer side effect profile than codeine and is equally effective for cough suppression.

Guaifenesin , an expectorant, is available as a single-ingredient formulation and is also a common ingredient in combination products with codeine or dextromethorphan.

- Thanks For Listining