ASTHMA

(CHAPTER 18.3)

QUESTION 1

Define asthma.

ásthma (labored breathing)

ASTHMA

"a **chronic inflammatory disease** of the airways of the lungs"

QUESTION 2

Describe some risk factors of asthma.

Asthma is a **multifactorial** disease, involving both genetic predisposition and environmental factors.

There is a strong **genetic component**; those with at least one parent with asthma are **3-6 times** more likely to develop asthma themselves.

Asthma is also more common in those with **respiratory allergies**, as these can trigger inflammation in those with predisposition for asthma.

QUESTION 3

Describe the pathophysiology of asthma.

Asthma consists of three basic pathophysiologic processes, all of which work together to inhibit airflow:

inflammation of the airways

hypersecretion of mucus

bronchoconstriction (or bronchospasm)

Inflammation of the airways can be acute, but often progresses to a chronic inflammatory state where the airways are partially constricted even at baseline.

This long-term inflammation can lead to **airway remodeling**, where structural changes such as fibrosis permanently alter the function of the airways.

The inflammatory process also leads to **hypersecretion** of mucus in the airways, with this excess fluid further contributing to respiratory obstruction.

These inflamed airways become **hypersensitive** to allergens, resulting in **bronchoconstriction** in which the smooth muscle around the airway constricts, further reducing the lumen and seriously obstructing airflow.

QUESTION 4

Describe the symptoms of asthma.

Dry cough, **wheezing**, **shortness of breath**—often worsened by exercise or by exposure to allergens, smoke, etc.

Can also present with other symptoms of allergies such as **allergic rhinitis**.

QUESTION 5

Why would flu vaccination be important for an asthma patient?

Asthma patients are at increased risk for developing **serious complications** of influenza.

Flu infections can trigger or worsen asthma, causing even more extensive narrowing of the airways.

Airway obstruction due to asthma can lead to the development of **pneumonia** during a flu infection.

QUESTION 6

Why would beta-adrenergic agonists be used in the treatment of asthma?

Smooth muscles of the airway are controlled by the **autonomic nervous system**.

The **parasympathetic** nervous system constricts the muscles of the airway, and the **sympathetic** nervous system relaxes them.

β-adrenergic agonists such as **albuterol** (short-acting) and **salmeterol** (long-acting) trigger the SNS, causing relaxation of the airway smooth muscle.

These drugs **work quickly**, and thus short-acting β-adrenergic agonists are commonly used in "rescue inhalers" for treating acute asthma attacks.

QUESTION 7

Why would inhaled anti-inflammatory drugs (corticosteroids) be used in the treatment of asthma?

Anti-inflammatory drugs are used in the management of patients with **persistent** (not intermittent) asthma.

Inhaled corticosteroids such as **fluticasone** can, over time, reduce the chronic airway inflammation associated with persistent asthma.

These drugs take effect gradually over the course of months, and are **not suitable** for treating acute asthma attacks.

QUESTION 8

Is asthma a restrictive or obstructive disease?

Asthma interferes with the flow of air **inside** the airways, making it an **obstructive** pulmonary disease.