COPD Overview (Chronic Obstructive Pulmonary Disease Overview)

COPD, or chronic obstructive pulmonary disease, is primarily caused by inhaled toxins. This can come from smoking or environmentally inhaled toxins or fumes. This can also be caused by alpha-1-antitrypsin deficiency, which is an autosomal co-dominant disorder that decreases lung elasticity. Types of COPD include asthma, chronic bronchitis and emphysema, which can be diagnosed using spirometry studies. COPD is characterized by persistent airflow limitation that progresses slowly. Patients with COPD may also have emphysema, chronic bronchitis, and/or asthma.



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Causes

Inhaled Toxins

Inhaling Toxic-green-glow

The main cause of COPD is smoking, but environmentally inhaled toxins like pollution, chemical fumes, or exposure to asbestos and other toxic workplace dust can also trigger the disease.

Smoking

Cigarette

The major risk factor for COPD is cigarette smoking. Up to 15% of smokers develop COPD, and patients with a history of smoking and an age greater than 40 are at greatest risk.

AAT Deficiency

Armored Assault Tank

Alpha-1-antitrypsin (AAT) deficiency is an autosomal co-dominant disorder that leads to a deficiency of protein in the lungs and liver. Normally, AAT degrades and protects the lung from destructive enzymes including neutrophil elastase. Without alpha-1-antitrypsin, the lungs become inflamed and lose elasticity, leading to COPD. This occurs especially in tobacco smokers.

Assessment

Emphysema

M-fist-zebra

Emphysema is described as an abnormal permanent enlargement of the air spaces distal to the bronchioles. There is alveolar wall destruction, but with little fibrosis. It is important to know that with this type of COPD the lungs lose elasticity and are unable to properly push air through the bronchial tree.

Chronic Bronchitis

Crone Broccoli-on-fire

Another type of COPD is chronic bronchitis. This is defined of the presence of a chronic productive cough for three months in each of two consecutive years. The pathophysiology involves chronic inflammation of the bronchi and bronchioles, causing airflow obstruction.

Asthma

Asthma-inhaler

Asthma may also be considered COPD if the airway destruction is irreversible, and the patient has other features of COPD, described as the asthma-COPD overlap syndrome. This may be due to airway remodeling secondary to chronic inflammation. Additionally, many patients with chronic bronchitis and/or emphysema have partially reversible airway obstruction, and therefore are considered to have comorbid asthma with the overall diagnosis remaining as COPD.

Considerations

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Spirometry

Spirometer

COPD is considered in patients with chronic cough, dyspnea, and a history of smoking. Spirometry is used to confirm this diagnosis. It involves measuring air movement as a patient inhales and exhales, and allows calculation of important pulmonary values such as forced vital capacity (FVC). Knowing these values can help with diagnosis and staging of disease.

Slow Progression

Snail Progressing

COPD is a slowly progressive disease and patients develop symptoms over a long period of time. Often the severity of symptoms associated with COPD worsen, ultimately leading the patient to seek treatment because of respiratory difficulty.

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