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Chronic obstructive pulmonary disease (COPD)

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) is an umbrella term used to describe progressive lung diseases including emphysema, chronic bronchitis, and refractory (non-reversible) asthma. This disease is characterized by increasing breathlessness.

COPD is a progressive and (currently) incurable disease, but with the right diagnosis and treatment, there are many things you can do to manage your COPD and breathe better. People can live for many years with COPD and enjoy life. This is in contrast to the variable airways obstruction seen in asthma which can be reversed by drug treatment. The airflow obstruction in COPD is due to damage to the lung structure and destruction of lung tissue (emphysema). This is normally due to smoking, but recurrent infection also contributes to the process. Whilst preventable (COPD is mainly caused by smoking) and increasingly treatable, the airflow obstruction seen in COPD is usually progressive. More recently the systemic effects of more severe COPD have been recognized, including weight loss, nutritional disturbances and abnormal skeletal muscle function. There are different types of COPD.

Each type may affect how well different treatments work, how your symptoms affect your everyday life, and how they progress. If you have another health condition in addition to COPD (co-morbidity), such as high blood pressure, heart disease, heartburn, depression, or diabetes, this can also affect your COPD and how it is managed. Chronic Obstructive Pulmonary Disease (COPD) stands for chronic obstructive pulmonary (lung) disease. COPD is a term applied to a family of diseases that includes emphysema, chronic bronchitis, and emphysema due to alpha-1 antitrypsin deficiency. The symptoms, causes, and diagnosis of COPD are discussed.

Keywords: COPD (Chronic obstructive pulmonary disease), Diseases, signs and symptoms, asthma

Introduction

The World Health Organization (WHO) defines chronic obstructive pulmonary disease (COPD) lung disease characterized by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible. This is in contrast to the variable airways obstruction seen in asthma which can be reversed by drug treatment. The airflow obstruction in COPD is due to damage to the lung structure and destruction of lung tissue (emphysema). This is normally due to smoking, but recurrent infection also contributes to the process. Whilst preventable (COPD is mainly caused by smoking) and increasingly treatable, the airflow obstruction seen in COPD is usually progressive. More recently the systemic effects of more severe COPD have been recognized, including weight loss, nutritional disturbances and abnormal skeletal muscle function. COPD is also frequently associated with, and may contribute towards, numerous co-existing diseases such as heart disease, osteoporosis and diabetes, which influence morbidity and mortality.

Common symptoms of COPD include chronic cough, sputum production and shortness of breath. People with COPD are at increased risk of chest infections, some of which will be severe enough to require hospitalization. Measurement of lung function using spirometer confirms the diagnosis and helps to classify the severity of the disease. Spirometer measures the amount (volume) and speed (flow) of air that can be inhaled and exhaled, and is also useful to monitor the progress of the disease and the response to treatment.

Definition

Chronic obstructive pulmonary disease (COPD) is a lung disease characterized by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible. The more familiar terms 'chronic bronchitis' and 'emphysema' are no longer used, but are now included within the COPD diagnosis. COPD is not simply a "smoker's cough" but an under-diagnosed, life-threatening lung disease.

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Signs and symptoms

In its early stages, COPD may not cause any symptoms, or they may be so mild that the individual does not notice them at first. The symptoms and severity of COPD can also vary from person to person. However, because the disease is progressive, symptoms often get worse over time.

The early signs and symptoms of COPD can include:

Chronic cough

- A persistent, or chronic, cough is often one of the first symptoms of COPD. A person may experience a chesty cough that does not go away on its own. Doctors generally consider a cough that lasts for longer than 2 months to be chronic.
- Coughing is a protective mechanism that typically occurs in response to irritants, such as inhaled cigarette or tobacco smoke, getting into the lungs. Coughing also helps remove phlegm, or mucus, from the lungs.

Shortness of breath and tiredness

- The obstruction of the air passages can make it more difficult for a person to breathe, which can lead to shortness of breath. This is another common symptom of COPD.
- At first, shortness of breath may only occur after exercise, but it can worsen over time. Some people cope with their breathing difficulties by becoming less active, which can lead to them becoming less physically fit.
- Because their lungs are not functioning normally, people with COPD are more likely to experience chest infections, including the common cold, flu, and pneumonia.

Causes of COPD

Cigarette smoke is by far the most common reason people get COPD. You can also get it from tobacco products, such as cigar and pipe smoke, especially if you breathe in the smoke.

Pollution and fumes

You can get COPD from air pollution. Breathing in chemical fumes, dust, or toxic substances at work can also cause it.

Genetics

In rare cases, people with COPD have a defect in their DNA, the code that tells your body how to work properly.

This defect is called “alpha-1 antitrypsin deficiency,” or AAT deficiency. When you have this, your lungs don't have enough of a protein needed to protect them from damage. This can lead to severe COPD.

Diagnosis

Spirometer: A test called spirometer can help show how well your lungs are working.

You'll be asked to breathe into a machine called a spirometer after inhaling a medication called a bronchodilator, which helps widen your airways.

The spirometer takes two measurements: the volume of air you can breathe out in one second, and the total amount of air you breathe out. You may be asked to breathe out a few times to get a consistent reading.

Chest X-ray

- A chest X-ray can be used to look for problems in the lungs that can cause similar symptoms to COPD.

- Problems that can show up on an X-ray include chest infections and lung cancer, although these don't always show up.

Blood tests

A blood test can pick up other conditions that can cause similar symptoms to COPD, such as low iron levels (anemia) and a high concentration of red blood cells in your blood (polycythemia).

Further tests

Sometimes more tests may be needed to confirm the diagnosis or determine the severity of your COPD.

- An electrocardiogram (ECG) – a test that measures the electrical activity of the heart.
- An echocardiogram – an ultrasound scan of the heart.
- A peak flow test – a breathing test that measures how fast you can breathe out, which can help rule out asthma.
- A blood oxygen test – a peg-like device is attached to your finger to measure the level of oxygen in your blood.
- A computerized tomography (CT) scan – a detailed scan that can help identify any problems in your lungs.
- A phlegm sample – a sample of your phlegm (sputum) may be tested to check for signs of a chest infection.

Management

The associations of weight loss and muscle wasting in COPD patients have been shown to increase morbidity and mortality. Nutrition supplement therapy along with exercise is advised in such patients. Screening for malnutrition: The patients with COPD should be monitored for the presence of pulmonary cachexia or weight loss approximately every 6 to 12 months or at the time of routine visits. Patients are assessed for a weight lesser than 90% of ideal body weight or BMI \leq 20.

General measures: Reducing the work of breathing by optimizing the lung function. This reduces the caloric requirement and expenditure and also increases patient's adherence to exercise.

Regular exercise: This not only stimulates appetite, but also improves the effectiveness of nutritional therapy.

Prevention

Primary prevention of COPD:

Avoidance of tobacco exposure (both active and passive measures) and toxic fumes are of invaluable importance in primary prevention of COPD. All smokers should be offered interventions aimed at smoking cessation, including pharmacotherapy and counseling. Although smoking cessation may be associated with minor short-term adverse effects such as weight gain and constipation, its long-term benefits are unquestionable. For disease due to occupational exposures, primary prevention is achieved by elimination or reduction of exposures in the workplace.

Secondary prevention of COPD

Use of calcium and other medication may be necessary to prevent or treat osteoporosis in some patients, especially older women on long-term corticosteroid therapy. Bone density scans are done to evaluate progression of this condition.

Prognosis

Though you're facing a life-threatening lung disease, knowing

that you have it means you can start taking action. That puts you ahead of another 12 million Americans who don't yet know they may have COPD.

Early disease

There is no such thing as an average case of COPD. One person's experience may differ dramatically from another's. In general, lung function declines slowly but steadily, until there's a sudden worsening of symptoms. That speeds up lung damage. To monitor someone with COPD, doctors keep tabs on their current symptoms, lung function tests, and other conditions such as heart disease and diabetes that are often also seen in people with COPD.

Later disease

At first, this just means being short of breath after strenuous exercise. Later, it means getting out of breath from walking in a hurry, or from going up a flight of stairs. Eventually, someone with COPD has to stop for breath after walking slowly for just a few minutes. In the end, dressing and undressing becomes difficult.

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