Number 1:

Chronic obstructive pulmonary disease

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What is it?

Chronic obstructive pulmonary disease (COPD) is the term given to chronic lung conditions in which there is a limitation of airflow in the lungs – sometimes it is termed chronic airflow limitation (CAL). The main disorders that constitute this group of conditions are chronic bronchitis, emphysema and chronic asthma.

Chronic Bronchitis

Chronic bronchitis, as its name implies, is a chronic inflammation of the airways (bronchi), usually caused by smoking. The airway walls become thickened and the bronchial mucous glands are over productive, leading to cough with sputum production and airway narrowing, which causes difficulty in breathing (dyspnea). Patients are subject to infections, and colds are usually associated with increases in sputum that may persist for longer than usual. In addition to smoking, chronic bronchitis occurs more frequently than expected in people in several occupations such as mining, and in areas of high pollution.

Emphysema

In emphysema, the airsacs or alveoli deep in the lung become distended and their walls break down, leading to poor lung function in which the exchange of gases (oxygen taken in to the bloodstream and carbon dioxide given out) becomes inefficient. This condition is also caused by smoking, but there is also a familial condition (alpha-one antitrypsin deficiency) in which severe emphysema occurs even in nonsmokers. The main symptom of emphysema is shortness of breath on exertion.

Asthma

Asthma is characterized by variable airflow limitation because of an allergic inflammation in the airways, leading to attacks of wheezing that are generally controlled by appropriate treatment. However, sometimes it can lead to a more-or-less chronic shortness of breath.

Commonly, it is possible to recognize some features of all these conditions in a given patient, who may have a chronic productive cough (bronchitis), be very short of breath on exertion because of emphysema and yet has some variability to suggest an asthmatic component to their problem. Finally, in children the combination of productive cough, recurrent chest colds and disability may be because of cystic fibrosis.

How is COPD diagnosed?

COPD is recognized by the occurrence of the above symptoms, and its severity is measured mainly by a simple lung function test that measures expired airflow expressed as the forced expiration volume in 1 s (FEV₁), usually as a percentage of that expected for the patient's sex, age and height. Other lung function tests can assess the severity of emphysema and asthma. These tests are now readily available at your doctor's request.

How does it progress and what other effects does it have?

Usually patients with COPD show a gradual progression in disability and worsening lung function that is two or three times greater than the usual deterioration that everyone experiences with advancing age; in patients who stop smoking, the deterioration is lessened. With the accompanying decrease in activity, secondary changes occur in muscles, leading to fatigue and greater shortness of breath. Also, the effects of poor lung function on gas exchange lead to a lowering of blood oxygen and increase in blood carbon dioxide, which indirectly leads to effects on kidney and heart function, with retention of fluid in the body (ankle swelling and liver congestion).

What can be done to slow this progression?

There are many measures that can reduce the deterioration in lung function and increasing disability. None is more effective than stopping smoking; your doctor has access to several programs to help you quit. Other measures that are important are the use of airway dilators in the form of inhalers (puffers) and tablets, antibiotics for chest infections, preventive vaccination against pneumonia and influenza, rehabilitation and muscle strengthening exercises, oxygen where necessary to maintain activity and prevent heart problems, and in selected cases, surgery to improve lung function. All of these measures will be the subject of future presentations in this series.

Resources available to patients with COPD

COPD is one of the medical conditions for which resources are well developed, both within the health care system and outside it. As well as using the professional expertise of your family physician, referral to a respirologist may be helpful and the resources of a local pulmonary function laboratory are available by request to your physician. You should enquire whether referral to a physiotherapist for breathing exercises and a therapeutic exercise program is indicated in your case, and whether there is a local pulmonary rehabilitation program. Your pharmacist will be able to advise you on the best way to take medications including inhalers. Your local lung association (Christmas Seals) may run a 'Better Breathing Club' and programs to help you quit smoking; this organization also has educational material specifically targeted to patients.

If you have access to the Internet, there are several web sites that provide information for patients, of which the following is a partial listing:

- Canadian Lung Association – www.lung.ca; this is an excellent site with a lot of advice under 'chronic obstructive pulmonary disorder' in the A-Z of pulmonary disorders
 - Respiratory Therapy Society of Ontario – www.rtso.org
 - British Lung Foundation – www.lunguk.org
 - American Lung Association – www.lungusa.org
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