Presenting symptoms in respiratory diseases

Patients with respiratory disease may present with any of the following symptoms

1. Cough
2. Sputum
3. Haemoptysis
4. Chest pain
5. Dyspnoea (Breathlessness)
6. Wheezing

Cough and sputum

Cough is the most frequent symptom of respiratory disease. It is basically a normal protective mechanism that ensures the removal of mucus and foreign particles from the airways. Impairment of cough reflex is harmful and subject the individual to the risk of aspiration.

Cough due to diseases is persistent and excessive. It is caused by stimulation of sensory nerves in the mucosa of the airways or the lung parenchyma.

Cough starts with deep inspiration, followed by strong expiration against closed glottis, which suddenly opens with explosive flow of air, followed by restoration of inspiration.

Loss of the explosive component of cough occurs in respiratory muscle paralysis and vocal cord palsy. Paralysis of the vocal cords also makes cough prolonged, low pitched and inefficient (bovine cough) commonly associated with hoarseness of voice.

Causes of cough

Cough may result from diseases originating from various parts of the respiratory tract:

1. Pharynx: postnasal discharge "rhinitis and sinusitis"
2. Larynx: whooping cough (pertussis), laryngitis and laryngeal tumour
3. Trachea: tracheitis
4. Bronchi: acute bronchitis, chronic obstructive pulmonary disease (COPD), asthma, bronchiectasis and bronchial carcinoma (lung cancer)

5. Lung parenchyma: pneumonia, tuberculosis, pulmonary oedema and pulmonary fibrosis
6. Drug side effect (angiotensin converting enzyme (ACE) inhibitors)

Characteristic features

Cough from laryngeal disease is commonly associated with hoarseness of voice, is painful, occurring in paroxysms and often associated with stridor (an inspiratory noise) or bovine cough (if the vocal cords are paralysed).

Cough of trachiitis is associated with a raw retrosternal pain aggravated by the cough.

Cough of asthma is dry (non-productive), worse at night and early morning and on exposure to irritants, often accompanied by dyspnoea and wheezing.

Cough of chronic bronchitis (in patients with COPD) can be dry or productive, worse in the morning.

Cough of lung cancer is persistent, often with haemoptysis.

Tuberculosis causes cough that is productive of purulent sputum, commonly with haemoptysis.

In bronchiectasis, cough is associated with copious sputum, mostly purulent and often induced by changing posture with intermittent haemoptysis.

In acute pulmonary oedema, cough is associated with severe dyspnoea, productive of frothy sputum.

Chronic cough

Unproductive cough lasting for more than 8 weeks in the presence of normal chest X-ray and spirometry is termed chronic cough. This type of cough occurs in 5 important conditions:

1. Postnasal discharge secondary to rhinosinusitis
2. Cough-variant asthma (where cough is the principle or exclusive manifestation of asthma)
3. Gastro-oesophageal reflux disease with aspiration
4. ACE inhibitor cough occurring in 10%-15% of patients
5. Whooping cough due to *Bordetella pertussis* infection

Haemoptysis

Coughing up blood, irrespective of its amount is called haemoptysis. It is a serious and alarming symptom to the patient. It should be differentiated from haematamesis (vomiting of blood) and form gum or nose bleed (epistaxis).

Common causes of haemoptysis are:

1. Lung cancer
2. Tuberculosis
3. Bronchiectasis
4. Pulmonary embolism
5. Acute tracheo-bronchitis
6. Pneumonia

Characteristic features

A history of repeated small haemoptysis or blood streaking of sputum is highly suggestive of lung cancer, particularly in smokers.

Haemoptysis in association with fever suggest an infectious cause. Acute fever and haemoptysis occur in pneumonia (where rust-coloured sputum is characteristic of pneumococcal pneumonia) or in acute bronchitis. Haemoptysis in a patient with longer history of fever, weight loss and night sweating suggest tuberculosis (or lung abscess).

Coughing frank blood without associated sputum suggests a vascular cause like pulmonary embolism or bleeding disorder.

Chest pain

Respiratory causes of chest pain include:

1. Pleurisy: a sharp peripheral chest pain aggravated by deep breathing or cough originates in the pleura and indicates pleural infection (as in pneumonia, lung abscess or tuberculosis) or infarction (in pulmonary embolism), but it can also result from malignant infiltration of the pleura (as in lung cancer)
2. Tracheitis (as described before)
3. Massive pulmonary embolism causes severe central chest pain with severe breathlessness

4. Musculoskeletal chest pain is exacerbated by movement and associated with local tenderness
5. Malignant infiltration of the chest wall and ribs causing gnawing continuous local pain.

Chest pain that is central is most often a manifestation of heart disease, although it can also occur in oesophageal disease, aortic dissection, as well as respiratory causes like massive pulmonary embolism, tracheitis and mediastinal tumours.

Dyspnoea (Breathlessness)

Breathlessness is feeling of uncomfortable need to breathe. Breathlessness can be physiological (during exercise) or pathological, where it is mostly due to disease of the lung or the heart.

Patients with dyspnoea may present with chronic exertional dyspnoea or in an emergency with acute severe dyspnoea.

Chronic dyspnoea

Such presentation can be due to heart disease (chronic heart failure) or to respiratory disease.

Patient with cardiac dyspnoea commonly have a history of coronary heart disease and hypertension. They also have orthopnoea (dyspnoea on lying flat) and paroxysmal nocturnal dyspnoea.

Respiratory causes of chronic dyspnoea include the following conditions:

1. In COPD, dyspnoea is mainly exertional. There is progressive loss of exercise capacity over months and years, but the disability is constant over days. Dyspnoea is less prominent overnight, but orthopnoea can occur (because the abdominal contents displace the diaphragm up on lying down making dyspnoea worse).
2. Asthma: asthmatic patients typically have variable degree of dyspnoea within and between days. Many patients are not dyspnoeic between attacks. Cough and wheezing are commonly present with dyspnoea. Nocturnal symptoms are common.
3. Interstitial lung disease (like pulmonary fibrosis) causes relentlessly progressive breathlessness, which may be present even at rest, often with dry cough

Causes of dyspnoea which are neither cardiac nor respiratory include obesity and severe anaemia.

Acute severe breathlessness

It is one of the most common and dramatic medical emergencies. Causes include the following:

1. Acute severe asthma (acute exacerbation)
2. Acute exacerbation of COPD
3. Acute pulmonary embolism
4. Acute pulmonary oedema (acute severe left heart failure)
5. Pneumothorax
6. Severe pneumonia
7. Upper airway obstruction (foreign body inhalation, laryngeal oedema as in anaphylaxis)
8. Acute respiratory distress syndrome (ARDS)
9. Metabolic acidosis (in diabetic ketoacidosis, uraemia and some types of poisoning like aspirin)
10. Psychogenic hyperventilation