Patient

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Breathlessness

Synonym: dyspnoea

Breathlessness is the distressing sensation of a deficit between the body's demand for breathing and the ability of the respiratory system to satisfy that demand. Breathlessness can be classified by its speed of onset as [1]:

- Acute breathlessness: develops over minutes, hours, or days.
- Chronic breathlessness: develops over weeks or months and lasts more than one month [2].

Chronic refractory dyspnoea is defined as breathlessness daily for three months at rest or on minimal exertion where contributing causes have been treated maximally. Common causes include chronic obstructive pulmonary disease (COPD), heart failure, advanced cancer and interstitial lung diseases [3].

Physiologically, we are all aware of breathlessness when we exercise beyond our normal tolerance but pathologically it can occur with little or no exertion. Afferent sources for the sensation of breathlessness arise from receptors in the upper airway, lungs and chest wall as well as autonomic centres in the brain stem and motor cortex. It is almost always associated with fear and, when chronic, can be disabling and severely diminish quality of life [4].

Aetiology

Approximately two thirds of cases of dyspnoea in adults are due to a pulmonary or cardiac disorder. In about a third of cases, diagnosis will be multifactorial [5].

Acute causes of breathlessness [6]

Cardiac causes

- Severe pulmonary oedema.
- Acute myocardial infarction.
- Cardiac arrhythmia.
- Pericarditis and pericardial effusion.

Pulmonary causes

- Pneumonia.
- Pneumothorax.
- Pulmonary embolism.
- Asthma.
- Acute exacerbation COPD.
- Acute respiratory distress syndrome.
- Large airway obstruction - eg, anaphylaxis, foreign body, lung cancer and epiglottitis.

Other causes of acute breathlessness

- Pain.
- Diabetic ketoacidosis.
- Drugs - eg, aspirin overdose.
- Trauma - eg, to the larynx.
- Hyperventilation and panic attack.
- Thyrotoxicosis.
- Altitude sickness.

Chronic causes of breathlessness [5]

Cardiac causes

- Left ventricular disease.
- Heart valve disease (mitral and aortic stenosis).
- Arrhythmias.
- Pericardial disease.

Pulmonary causes

- Asthma.
- COPD.
- Lung fibrosis.
- Pleural effusion.
- Emphysema.
- Lung cancer.
- Bronchiectasis.

Other causes

- Severe anaemia
- Psychogenic - eg, anxiety.
- Neuromuscular causes - eg, myasthenia gravis, Guillain-Barré syndrome.
- Thromboembolic disease.
- Thyroid disease.
- Obesity[7].

Epidemiology

Next to pain, breathlessness is the most common symptom for which patients seek help and relief from their doctor. Peak incidence of chronic dyspnoea occurs in the 55 to 69 year-old age bracket[5].

History

- Duration of breathlessness and speed of onset, ie acute, chronic.
- Timing of breathlessness - eg, diurnal variation with asthma.
- Any known precipitating events - eg, trauma, palpitations, chest pain, exercise.
- Past medical history - allergy, chest or cardiac disease, anxiety-related disorder.
- Family history, especially heart disease.
- Lifestyle/occupation - smoking history, occupation, pets, close contact with birds.
- Drug exposure (beta-blockers, amiodarone, nitrofurantoin, methotrexate, heroin).

Assessment

Try to quantify exercise tolerance (eg, breathlessness at rest, with talking, dressing, distance walked or number of stairs climbed). There are a number of simple scales to assess the severity of breathlessness - eg, the modified Medical Research Council (MRC) dyspnoea score[7]:

- Grade 0: not troubled by breathlessness except on strenuous exertion.
- Grade 1: short of breath when hurrying on level ground or walking up a slight incline.
- Grade 2: walks slower than contemporaries because of breathlessness, or has to stop for breath when walking at own pace.
- Grade 3: stops for breath after walking about 100 metres or stops after a few minutes of walking on level ground.
- Grade 4: too breathless to leave the house or breathless on dressing or undressing.

NB: there is no accepted gold standard for measuring breathlessness - unidimensional tools such as the above are recommended for assessing severity but multidimensional tools are required to capture the impact on quality of life[8].

Examination

Should include:

General

- Patient distress, colour of skin and lips, cyanosis, clubbing, lymphadenopathy, tremor, flap.
- Respiratory rate.
- Pulse - rate, rhythm.
- Height and weight (body mass index).

Chest

- Trachea - central, deviated to one side.
- Shape of chest - eg, kyphosis.
- Movement of chest - symmetrical, asymmetrical.
- Percussion note - eg, stony dull over a pleural effusion, hyper-resonant over a pneumothorax.

Auscultation of chest

- Wheezing/rhonchi - eg, asthma, COPD, heart failure, bronchiolitis.
- Crepitations - eg, pneumonia, bronchiectasis, fibrosis.
- Stridor - eg, foreign body, acute epiglottitis, anaphylaxis, trauma.
- No added sounds - eg, anaemia, pulmonary embolus, metabolic acidosis, neuromuscular causes.

Investigations[5]

These will be dependent on the findings of the history and examination but may include:

- Lung function tests - eg, peak flow measurement, spirometry.
- Pulse oximetry.
- CXR.
- Venous blood tests: FBC, brain natriuretic peptides (BNPs).
- Arterial blood gases.
- ECG.
- Imaging:
    - Echocardiogram.
    - High-resolution CT scan.
    - V/Q scan.
    - Radioallergosorbent test (RAST) measurement or skin prick testing to common aero-allergens.

Management

This is dependent on the underlying cause.

In an acute situation, breathless individuals should be assessed rapidly and treated with high-flow oxygen (>60%) unless there is a known history of COPD, in addition to any specific therapy for the underlying condition. If unstable, transfer to hospital should be arranged as an emergency.

In the chronic situation, the underlying cause should be addressed and treated. Frequently breathlessness is a common end point of non-reversible disease and symptomatic relief should be sought instead.

Strategies for relieving breathlessness (of respiratory origin)

Reassure and educate the patient and caregivers to increase confidence in their ability to control and interpret symptoms.

Controlled breathing technique counteracts the fast, shallow, inefficient breathing associated with dyspnoea:

- Control respiratory rate.
- Use diaphragmatic breathing.
- Relax shoulders and upper chest.

Sit upright: leaning forward when standing or nursing a bed-bound patient as upright as possible can help to relieve breathlessness.

Modify activities of daily living, lifestyle and expectations in line with disability but avoid excessive restrictions on activity.

Cognitive behavioural therapy (CBT) seeks to modify the patient's response to the symptom. Anxiety and panic can be reduced often by using techniques such as distraction or relaxation.

Pulmonary rehabilitation

Individuals with severe breathlessness become less active and their general fitness levels diminish, causing a cycle of worsening breathlessness with less and less physical exertion.

Supervised pulmonary rehabilitation programmes of exercise training have been shown to be beneficial in COPD, improving both dyspnoea and fatigue levels [9]. Rehabilitation should not be neglected in a palliative setting [10].

Nutrition

Patients with severe respiratory disease tend to be cachectic and have such generalised muscle weakness that the work of breathing is extremely demanding. Addressing nutritional support with a dietician may be helpful.

Oxygen therapy

Ongoing or intermittent oxygen therapy via a face mask or nasal prongs may be of benefit in some selected cases. In chronic heart and lung disease, benefit is only evident where there is confirmed hypoxia or pulmonary hypertension. Consistent benefit of oxygen therapy in advanced lung cancer or cardiac failure patients has not been shown [11].

Partial ventilation support - continuous positive airway pressure (CPAP) can be used for several hours a day to rest chest muscles but is intrusive and of temporary benefit only.

Palliative care and symptomatic treatments [12]

- Consider using a strong opioid in people who need symptomatic treatment of dyspnoea, especially those with shortness of breath who are near the end of life.
- Anxiolytics can relieve dyspnoea by depressing hypoxic or hypercapnic ventilatory responses and altering the emotional response to dyspnoea.
- Corticosteroids may be necessary in emergency situations involving airway obstruction but otherwise should ideally be initiated only by, or on the advice of, a specialist.

Further reading & references

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