

Chronic obstructive pulmonary disease in older patients

Chronic obstructive pulmonary disease (COPD) is a common disorder in patients over the age of 35 who have an associated risk factor (generally smoking) and characteristic respiratory symptoms. It has been projected to become the third leading cause of death worldwide by 2020.¹ Here, we summarise the current approach to diagnosis of COPD and management of the acute and chronic phases, including recent changes in guidance from the National Institute for Health and Clinical Excellence. Publication of a National Strategy for COPD is expected later this year.

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Chronic obstructive pulmonary disease (COPD) is used to describe clinical syndromes associated with lung destruction with consequent airflow obstruction that is not fully reversible. The airflow limitation is usually insidious in onset and progresses over years or decades. As it worsens, the risk of complications and exacerbations increases. Attempts to define the epidemiology of COPD have been hindered by under-reporting.² A systematic review and meta-analysis from 2006 suggests that the prevalence of physiologically defined COPD in adults over 40 years is 9–10%.³ About 900,000 people have been diagnosed in the UK and a further two million people are estimated to be undiagnosed.⁴

Cigarette smoking is by far the most important known cause of COPD, and the risk tends to increase with exposure. Cigarette smokers have a greater annual rate of decline in FEV1 and a greater COPD mortality rate than non-smokers.¹ Exposure to occupational dusts and chemicals (for example coal dust) can cause COPD, and exacerbations

are associated with periods of heavy atmospheric pollution.⁵ In addition, indoor smoke pollution from biomass fuels (derived from plant-based materials) in poorly ventilated dwellings is an important risk factor, especially in developing countries.¹

In a small number of cases, hereditary deficiency of α 1-antitrypsin causes increased neutrophil elastase activity in the airways, resulting in proteolytic damage and potentially pan-acinar emphysema. These individuals are advised never to smoke.

Although cough is often the first symptom of COPD, persistent and slowly progressive shortness of breath is the most common reason that patients seek medical attention.¹ The dyspnoea is usually worsened in exacerbations, which may be associated with increased or more purulent sputum production; wheezing and non-specific chest tightness may also be prominent features. Occasionally there may be signs of cor pulmonale, such as raised jugular venous pressure, tricuspid regurgitation, hepatomegaly and peripheral oedema.

Diagnosis

The diagnosis of COPD should be considered in any current or former smoker aged over 35 years who presents with symptoms of exertional breathlessness or impaired exercise tolerance, chronic cough, regular sputum production, wheeze or frequent chest infections. Patients under the age of 35 are highly unlikely to have had time to develop sufficient lung damage to make the diagnosis. Most patients with COPD have a history of at least 20 pack years of smoking.

If the diagnosis seems probable, spirometry should be performed to confirm the presence or absence of airflow obstruction (Table 1). Spirometry is considered possible in approximately 85% of older adults, impaired cognitive function being one of the main reasons for inadequate results.

A diagnosis of airflow obstruction can be made if the FEV1/FVC ratio is <0.7 . The recently updated NICE guidelines propose that post-bronchodilator spirometry should be performed

Table 1: Severity of COPD and predicted FEV1⁹

Severity of COPD	% predicted FEV1
Mild	≥80
Moderate	50–79
Severe	30–49
Very severe	<30%

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for confirmation; this reduces the potential for misdiagnosing a reversible lung disease such as asthma. An FEV1/FVC ratio of greater than 0.7 suggests the presence of a restrictive lung disease such as interstitial lung disease or musculoskeletal disorders (including kyphosis and obesity).

In addition, FEV1/FVC ratios fall progressively with age, and strict spirometric definitions of COPD will overestimate the prevalence in

older adults, leading to inappropriate diagnostic labels in some patients.⁶ Therefore, alternative diagnoses should be considered in older patients who meet the spirometric diagnostic criteria but who have no symptoms of COPD. The important differential diagnoses of COPD are shown in Table 2.

A chest X-ray should be performed in all suspected cases of COPD, mainly to exclude other conditions. If signs of cor pulmonale

are present on examination, an ECG may show features of right-sided heart strain. Finally, the clinician should have a high index of suspicion for left ventricular dysfunction, which is present in approximately 20% of COPD patients aged over 65.⁷

Management

It is imperative that patients who continue to smoke are encouraged to stop, and are supported throughout this process with the help of appropriate therapies (such as nicotine replacement therapy, bupropion or varenicline). Stopping smoking has been shown to significantly reduce the age-related decline in FEV1 in middle-aged smokers with mild airway obstruction.⁸

Pneumococcal vaccination and annual influenza vaccinations should be offered to all patients with COPD.

Stable COPD

The updated NICE guidance sets out a stepwise approach to the management of stable COPD.⁹ Symptoms can initially be controlled using a short-acting bronchodilator (β -agonist or anticholinergic) as required. For patients with persistent symptoms, a long-acting agent can be used: again, either a β -agonist (such as salmeterol or formoterol) or an anticholinergic (such as tiotropium); note that short- and long-acting anticholinergics should not be prescribed together.

Recent data from the UPLIFT study has shown that use of the long-acting anticholinergic bronchodilator tiotropium once daily improves quality of life and reduces exacerbations of COPD (hazard ratio for first exacerbation 0.86 [95% confidence interval: 0.81–

Table 2: Differential diagnosis of COPD

Condition	Suggested features
Asthma	Young age, atopy, non-smoker, nocturnal symptoms, family history, reversibility of airflow obstruction
Congestive cardiac failure	Orthopnoea, CXR evidence of pulmonary oedema, bibasal crackles, history of ischaemic heart disease
Interstitial lung disease	Dry cough, fine crackles basally, history of connective tissue disease, industrial exposure, drug toxicity
Tuberculosis	Weight loss, fever, haemoptysis, night sweats, immunosuppression, characteristic CXR changes
Bronchiectasis	Cough, frequent infections, larger volume sputum production, coarse crackles

0.91] compared with placebo).¹⁰ Tiotropium has also been associated with a 12% reduction in the risk of all-cause mortality, and a 23% reduction in cardiovascular mortality.¹¹ In contrast, concern has been raised regarding the cardiovascular safety profile of the antimuscarinic bronchodilator ipratropium bromide.¹²

If the FEV1 is less than 50% or if patients remain breathless or have exacerbations despite the use of longer-acting agents, then the use of inhaled corticosteroids should be considered, usually in combination with a long-acting β -agonist (LABA). A Cochrane review has shown that, in patients with stable COPD, this combination reduces exacerbations by 9% and mortality by about 20%, compared with steroids alone.¹³

Ensuring an effective inhaler technique is crucial to optimal drug delivery. In patients with impaired cognitive or executive function, the simpler the device, the more chance there is of success.

If exacerbations or breathlessness persist, the next step is maximal inhaled therapy, usually a long-acting muscarinic plus long-acting β -agonist plus inhaled corticosteroid. If symptoms still persist, oral theophylline may be considered.

Theophylline doses should generally be kept low in older people to avoid gastrointestinal side-effects and the risk of drug interactions, particularly with antibiotics during exacerbations.

In a few patients with advanced COPD who are unable to be weaned off corticosteroids following an exacerbation, maintenance oral corticosteroids may be required. If sputum management is problematic, a trial of mucolytic therapy (eg, carbocysteine) can be considered.

Pulmonary rehabilitation should be offered to all patients who consider themselves functionally disabled (usually Medical Research Council grade 3 and above). The proven benefits of pulmonary rehabilitation include improved exercise capacity, reduced severity of dyspnoea and improved health status.¹⁴

In severe COPD, and in anyone with signs of cor pulmonale, referral for home oxygen may be considered. Short burst therapy improves symptoms of breathlessness, and long-term therapy (LTOT) for at least 15 hours a day has been shown to improve survival in patients with severe COPD and persistent hypoxaemia.^{15,16} A simple screening test is to refer those with an oxygen saturation of <93%, or <95% and possible cor pulmonale.

LTOT should be prescribed in a period of clinical stability to current non-smokers if the following conditions are met: PaO₂ <7.3 kPa; or PaO₂ 7.3–8.0 with evidence of secondary polycythaemia, pulmonary hypertension, peripheral oedema or nocturnal hypoxaemia.

Patients with COPD must be monitored, which is why most primary care centres have disease registers. The Department of Health has finished consulting on the National Clinical Strategy for COPD, and suggests that once a person has a diagnosis of COPD, the following should be recorded on a disease register:¹⁷ FEV1, whether the readings are pre- or post-bronchodilator and severity characterisation according to GOLD guidelines; other symptoms that contributed to the diagnosis of COPD (cough, sputum and breathlessness); functional impairment (eg, MRC dyspnoea scale); exacerbation frequency; body-

mass index (BMI); smoking history and status; oxygen and blood gas assessment; educational knowledge of COPD; co-morbidities (including psychological conditions); ethnic group; and wishes for palliative and end-of-life care when identification of advanced disease has taken place.

COPD should be managed by a multidisciplinary team to ensure that all relevant areas are covered. For example, if the BMI is low, nutritional supplementation and dietetic review may be needed. Clinicians should be aware of the possibility of significant anxiety and depression, especially in older patients. Finally, it is important to recognise when a patient is in their last year so they can be added to an end-of-life care register and offered appropriate palliation.

Acute exacerbations

Acute exacerbations of COPD are characterised by increased breathlessness, cough, volume or purulence of sputum production, wheeze and chest tightness. They account for up to 10% of all medical admissions to UK hospitals¹⁸, and severe exacerbations are associated with an adverse effect on an individual's health status.¹⁹

They may be caused by viruses, bacteria or environmental pollutants, although in many cases the cause will remain unclear. The most common bacterial causes of exacerbations are *Haemophilus influenzae*, *Streptococcus pneumoniae*, and *Moraxella catarrhalis*.

Treatment with antibiotics for exacerbations with increased cough and sputum purulence reduces the risk of short-term mortality by 77% and decreases the risk of treatment failure by 53%.²⁰ A meta-analysis has shown that antibiotics reduce in-hospital mortality compared

with placebo.²¹ Local guidelines will determine initial choice of antibiotic therapy, but amoxicillin or doxycycline are commonly used. It is, however, reasonable to withhold antibiotics if there is no sputum purulence and only one of either increased sputum volume or breathlessness.²²

Patients admitted with an acute exacerbation should be given oxygen to maintain saturation between 88% and 92%. Most doctors are aware of the possible danger of giving too much oxygen to the patient with longstanding CO₂ retention (depressing hypoxic drive to breathe and worsening acidosis).

Initial management with systemic corticosteroids has been shown to reduce treatment failure and length of hospital stay, compared with placebo.²¹ Another study showed that oral prednisolone was not inferior to intravenous therapy as initial therapy for treatment failure in acute exacerbations,²³ and treatment should be continued for 7–14 days depending on severity. Generally, corticosteroids should be part of the package offered to someone with an exacerbation. Standby courses of antibiotics and corticosteroids are recommended for patients who frequently exacerbate as part of their self-management plan.

For admitted patients, non-invasive ventilation (NIV) is considered in those with a pH <7.35 despite maximal medical therapy. Compared to standard treatment, NIV reduces mortality, the need for intubation and length of stay.²¹

Conclusion

COPD is a common condition affecting the elderly, but it may be more difficult to diagnose in this

age group.

Treatment of stable disease is managed using a stepwise approach based on inhaled therapies, and NICE has recently updated its guidance on this. A multidisciplinary approach is important throughout, involving professionals from different backgrounds to ensure a broad and comprehensive assessment from diagnosis to end-of-life care.

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