The management of chronic obstructive pulmonary disease (COPD)

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Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a generic term that includes emphysema, chronic bronchitis, COAD and other acronyms. Each of the words of the label is carefully chosen. Chronic describes the time course of the disease. Obstructive refers to the physiological abnormality that characterises the disorder and without which it should not be diagnosed. Pulmonary is used rather than airway, because the various pathological processes can involve large airways (bronchitic component), medium airways (asthmatic component), small airways (the silent area) and the alveoli (emphysematous component). Disease is perhaps not entirely apt and the word syndrome might be a better description of this heterogeneous condition. The justification for lumping the various subtypes together is that clinical diagnosis and management is essentially the same.

COPD in the UK is almost always the result of cigarette smoking. It is responsible for 14 times as many deaths as occur from asthma and affects 7% of males and 3% of females over the age of 65. It is responsible for about 10% of all medical admissions to UK hospitals, second only to myocardial infarction [1] and it is one of the commonest reasons for consulting the GP in the over 55’s. Until recently many doctors were fatalistic about COPD. But much can be done to encourage smoking cessation and to relieve the symptoms even of severe disease. It was on this background that the British Thoracic Society drew together a multi-disciplinary committee to produce its guidelines [2], using the following definition:

“COPD is a chronic, slowly progressive disorder characterised by airflow obstruction (reduced FEV1 and FEV1/FVC ratio), which does not always change markedly over several months. Most of the lung function impairment is fixed, although some reversibility can be produced by bronchodilator (or other) therapy.”

This is a simple clinical definition but it implies that it is imperative to record spirometry as part of the diagnostic process. It is not possible to estimate lung function with any reliability on clinical grounds alone.

Spirometry

Spirometry is cheap, costing £5–10, and is available in every district hospital and in many primary care centres. There is therefore no reason why its use should not be routine. However, measurement must be done with a spirometer that produces a printout of the shape of the expiratory effort [3]. The only way to be sure that a patient has achieved reliable maximum expiratory efforts is to inspect the expirrogram to ensure the volume-time tracings are uniformly upwardly convex and to check that the FEV1 and FVC values for the best two tracings are within 100 mls of each other. Any professional intending to record spirometry should be formally trained.

In asthma Peak Expiratory Flow (PEF) measures have become widely used but this is not the case in COPD. There is a close relationship between PEF and the FEV1 in asthma but this is not true in COPD. In COPD there is a loss of elastic tissue and this means that the airways collapse more easily than in asthmatics during forced expiration even though the initial and peak flow rates may be similar. It is possible for patients with COPD to have a PEF that is 66% of predicted at the same time as having an FEV1 that is only 33% of predicted. Furthermore, a PEF cannot differentiate between an obstructive and a restrictive impairment and thus is of little value for diagnosis.

In primary [4] and secondary [5] care the use of spirometry is patchy. This lack of objectivity is almost certainly resulting in inappropriate therapy and a failure to help patients maximise their potential.
Management

Smoking cessation
COPD is a progressive disorder in those who continue to smoke, but it progresses at the rate of normal ageing in those who stop [6,7]. Even patients with severe COPD will benefit from stopping smoking with preserved function and an extended life expectancy. Effective strategies to help patients quit now exist [8].

Pharmacological management
Bronchodilators (often a beta agonist and an anticholinergic in combination) are the mainstay in early to moderate stages. Inhaler technique must be taught to patients and their understanding checked if the inhalers are to be of any benefit. There are no objective response criteria for assessing short term response because the changes in lung function are too small to be recognizable and so the use of bronchodilators depends on the patient reporting that symptoms are eased. The corollary (rarely done in practice) is that if symptoms are not eased then the treatment should be withdrawn or revised.

The role of inhaled steroids remains controversial. There is no indication in mild to moderate disease (FEV1 above 50% predicted) but it may reduce the number of acute exacerbations in more severely affected patients [9]. Physicians differ over whether this is sufficient to justify inhaled steroids routinely in severe COPD.

The new long acting beta agonists do have benefits in moderate to severe COPD with a significant and immediate improvement in quality of life scores. In contrast to the evidence for long acting beta agonists, the use of nebulisers is largely unsupported by studies. There are no randomised studies beyond a few weeks and even these provide conflicting evidence. Evidence to support their use is therefore not clear. Furthermore, a recent study showed that over half patients on nebulisers in a UK city did not fulfil the criteria for nebuliser prescription: in 40% there was not even a spirometric diagnosis and 40% of those with spirometry did not have severe COPD [10].

Long term oxygen treatment (LTOT) has substantial well documented benefits but only in those who are hypoxic and who have stopped smoking [11]. This is not an instance where doctors are rationing because of anti-smoking bias but because the evidence showed no benefit in those who continued to smoke. LTOT prevents severe nocturnal desaturation leading to pulmonary hypertension. Perhaps the biggest change in this author's career has been the virtual disappearance of severe cor pulmonale and secondary polycythaemia.

Non pharmacological treatment
COPD patients are almost always elderly with all the associated problems of old age. Pulmonary rehabilitation is a slowly growing service but with patchy availability across the UK. Exercise programmes, dietary advice, optimisation of treatments and attention to the social environment are all part of the service. Exercise in breathless patients is often a concern to patients and their relatives, who are worried that doing too much could provoke a disaster. In respiratory disease, the patients should be encouraged to exert themselves since there is no danger from becoming breathless and the more a patient keeps themselves in condition the more they are likely to be able to continue to do so. Countering this fear is an important part of helping patients to live with COPD.

The acute exacerbation
In asthma an acute exacerbation is a worsening of the underlying disease process and requires high doses of anti-inflammatory treatment. In COPD an acute exacerbation is the addition of some other problem (usually an infection) to the underlying condition. There are no absolute indications for selecting home or hospital treatment and a recent study [12] showed that patients without respiratory failure could be cared for at home with additional nursing support. Preventing an admission is politically acceptable and a good in the short term for both patient and the NHS, but after an acute episode has settled, the underlying COPD still needs to be properly addressed.

The standard treatment for an exacerbation is uncontroversial, consisting of increased bronchodilators, antibiotics if infection is likely (any two of increased breathlessness, increased volume of sputum or increased purulence of sputum) and oral steroids for those needing admission [13].

For those with respiratory failure there is a high in-hospital mortality. Aggressive treatment with non-invasive ventilation using face masks and bi-level pressure support has been shown to help patients through the crisis but it is a technique not even offered in many hospitals [5].

Conclusion
COPD is common and has for too long been treated in a haphazard manner. Objective confirmation of diagnosis with spirometry should be sought in all patients before committing patients to years of drug treatment. Smoking cessation is still the biggest gain for the patient and the NHS and anti-smoking clinics now have therapeutic weapons to aid simple counselling. But little will happen unless physicians are willing to take a lead in this important area.
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References


