Chronic obstructive pulmonary disease: time to ditch the old mindset

Chronic obstructive pulmonary disease (COPD) has long had a negative public image, seen as a largely untreatable condition. New therapies and rigorously evidence-based guidelines now provide treatment strategies which can have a major impact on the disease.

Improving care

Airflow obstruction in COPD is not fully reversible. This issue of 'irreversibility' (in contrast to asthma) has historically led to a rather nihilistic approach to its management.

Such pessimism is misplaced. There is now unequivocal evidence for interventions that can:

1. Slow the progression of the disease
2. Significantly improve crucial aspects of lung function
3. Improve dyspnoea, exercise tolerance and quality of life
4. Reduce exacerbation and hospital admission rates
5. Have a dramatic impact on mortality.

The guidelines on the management of COPD from the National Institute for Clinical Excellence (NICE, 2004) identify controlling symptoms, improving exercise tolerance and decreasing exacerbation frequency as aims of treatment. This reflects a shift from defining success by change in forced expiratory volume in 1 second (FEV_1) to targeting treatment at patient-focussed outcomes.

Impact on patients

COPD is a progressive condition with chronic airflow limitation secondary to airway and parenchymal changes. Smoking is its primary cause.

Early signs and symptoms of COPD include cough, sputum production and breathlessness – all often unrecognized by patients. As lung function deteriorates, worsening dyspnoea and increasing exercise limitation contribute to a cycle of physical deconditioning. Advanced disease is associated with the development of cor pulmonale (right heart failure) and progressive systemic involvement, weight loss, anorexia, osteoporosis, abnormalities of skeletal muscle, and anxiety and depression. COPD also impacts patients' ability to work and impairs social activities, family life and even sexual function.

The health and economic impact of COPD

According to to the World Health Organisation (WHO, 2003), in 2002, COPD was the third leading cause of death globally among people over 60 years old. In the UK it is estimated that 900 000 people have COPD and an equivalent number undiagnosed disease. In England and Wales in 2002/3, COPD accounted for over 109 000 hospital admissions, more than 72 000 consultant episodes and over 1 million hospital bed-days. The direct cost to the NHS was £492 million. Over half of costs are associated with inpatient care, emphasizing the importance of reducing exacerbations.

Diagnosis

By the time of diagnosis severe airway obstruction may already be present. Earlier diagnosis could lead to more successful intervention. Greater use of spirometry is now encouraged in the new General Medical Services (GMS) contract for GPs and may prove effective in earlier detection of cases.

Smoking

Smoking cessation is the most important intervention in COPD. It is the only firmly established disease-modifying strategy. Patients with COPD who smoke demonstrate an accelerated decline in FEV_1. At cessation, the rate of decline reverts to that seen in a non-smoker – i.e. no more than the natural ageing process (Fletcher and Peto, 1977).

This issue must be addressed by all healthcare professionals. Bupropion, nicotine replacement therapy and psychological support improve quit rates but do not replace a firm decision by the smoker to stop.

Bronchodilators

Short-acting bronchodilators are the initial empirical treatment for relief of breathlessness but patients who remain symptomatic should receive a long-acting bronchodilator. Effectiveness should not be assessed by lung function alone but by a variety of (patient focussed) measures (NICE, 2004). The long-acting anticholinergic tiotropium and the long-acting β2 agonists salmeterol and formoterol improve symptoms, exercise tolerance and quality of life. Tiotropium may also have an impact on disease progression (Barr et al, 2005).

Inhaled corticosteroids and combination inhalers

Inhaled corticosteroids are prescribed in over 70% of patients, yet in patients with mild COPD there is little evidence for their efficacy.

Inhaled corticosteroids do not improve symptoms in mild and moderate COPD (Vestbo et al, 1999), do not alter disease progression (Vestbo et al, 1999) and have no beneficial effect on mortality (Alsaeedi et al, 2002). In moderately severe patients (FEV_1 <50%), however, inhaled corticosteroids produce an approximate 25% reduction in exacerbation rate (Burge et al, 2000).

A number of studies demonstrate a greater improvement in exacerbation rate with combination inhalers (budesonide + formoterol and fluticasone + salmeterol) than either component alone (Calverley et al, 2003a,b) although in no individual study did this trend achieve statistical significance.

If patients remain symptomatic on monotherapy, their treatment should be intensified by combining therapies (NICE, 2004).

Treatment of exacerbations

During an acute admission for an exacerbation of COPD, antibiotics, oral corticosteroids and nebulized bronchodilators are usually prescribed and are effective.

Arterial blood gases should be monitored, and supplemental oxygen delivered at a controlled rate which achieves adequate oxygenation (saturation >90%) without precipitating respiratory acidosis (NICE, 2004). In patients with pH <7.35 ventilatory support should be considered (NICE, 2004).

Exercise and pulmonary rehabilitation

Pulmonary rehabilitation is a useful treatment with few, if any, side effects. Despite the direct costs, the benefits of improved quality of life and functional exercise capacity, and reduced dyspnoea (Lacasse et al, 2003) are valuable. Pulmonary rehabilitation should be made available to all patients who are functionally disabled by COPD.

Long-term oxygen therapy

Chronic hypoxia in severe COPD leads to pulmonary vasoconstriction, increasing the 'strain' on the right side of the heart, and ultimately to cor pulmonale. This condition, usually perceived as a minor issue of ankle swelling, can be fatal. In patients with either an arterial partial pressure of oxygen (PaO_2) <7.3 kPa or a combination of moderate hypoxia (PaO_2 7.3–8.0 kPa) and cor pulmonale, reversal of hypoxia with long-term supplemental oxygen (>15 hours/day) has been demonstrated to have a major impact on 5-year mortality (Nocturnal Oxygen Therapy Trial Group, 1980; Medical Research Council Working Party and Flenely, 1981). Oxygen does not prevent COPD progression per se (as assessed by decline in FEV_1). At 10 years there was no difference in survival between the two treatment limbs in this severe group of patients.

Surgical options

In appropriately selected patients, lung volume reduction surgery has been shown to improve FEV_1, walking distance and quality of life. In a very selective subgroup there is also a survival advantage (National Emphysema Treatment Trial, 2003). Lung transplantation is an effective but limited treatment modality.

Conclusions

COPD causes considerable morbidity and mortality and for too long was considered the poor relation to asthma (Calverley and Bellamy, 2000).

New pharmaceutical agents and therapeutic interventions have been developed. Guidelines have rigorously evaluated these options and provided timely reminders of the dramatic impact previously established interventions can have on the course of the disease and indeed mortality. Treatment strategies founded on a solid evidence base are thus provided which should dislodge the old nihilistic mindset and allow clinicians to make a real difference to patients' lives. BJHM

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KEY POINTS

- Chronic obstructive pulmonary disease (COPD) is a progressive condition with chronic airflow limitation which suffers from a negative public image and is seen as a largely untreatable condition.
- COPD causes considerable morbidity and mortality.
- New therapies and rigorous evidence-based guidelines provide treatment strategies which can have a major impact on COPD.
- Success in the treatment of COPD should now be measured by patient focussed outcomes rather than change in forced expiratory volume in 1 second.
- Evidence-based treatment strategies should dislodge the old nihilistic mindset, and allow clinicians to make a real difference to the lives of patients with COPD.