Age and Ageing 2004; **33:** 419–421
DOI: 10.1093/ageing/afh137

CLINICAL UPDATE

Current initiatives in the management of patients with chronic obstructive pulmonary disease: the NICE Guidelines and the recent evidence base

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Introduction

Chronic obstructive pulmonary disease (COPD) is a major cause of hospital admission, morbidity disability and high healthcare usage in old age [1–5]. Worldwide prevalence of COPD is estimated at 9.3 per 1000 males and 7.3 per 1000 females in all age groups [1–3]. COPD has been projected to increase in prevalence to become the fifth leading cause of disability and fourth leading cause of mortality by 2020 [5]. A recent study of the economic burden of COPD in developed countries estimated the annual societal cost (indirect cost including loss of productivity) at $3511 per patient in the UK [6]. The report also confirmed COPD as being relatively undiagnosed in the elderly, especially in the UK compared with other countries [6].

Acute exacerbations (AECOPD) are a common cause of hospital admission in patients with COPD. A patient with moderate to severe COPD is most likely to have on average three exacerbations per year [7–9] with an average length of hospital stay of 11 days, corresponding to a million hospital bed days in UK hospitals [3]. There were approximately 10,000 AECOPD admissions per million population of 75–84 year olds in England in 2000, 10 times the corresponding figure for 45–64 year olds [3]. A wide range of other factors have been reported as predictors of hospital admissions in COPD patients: these include low forced expiratory volume, impaired quality of life, physical disability and clinical anxiety as well as atmospheric pollution and flu outbreaks [8, 9]. Length of hospital stay is predicted by depression, number of co-morbidities and advanced age [9, 10].

The aims of this review are to explore recent initiatives in the management of patients during acute exacerbations and in the stable condition in moderate to severe chronic obstructive pulmonary disease. The review is timely given the current interest in COPD management as highlighted by the very recent publication of the National Institute of Clinical Excellence (NICE) guidelines [**11**] for the management of the condition.

Hospital at home

Increasing pressure on hospital beds especially in winter months, an ageing population and exponential healthcare costs associated with acute hospital care have led to a search for alternatives to inpatient hospital care. This in turn has produced alternative care initiatives for patients with acute exacerbations of COPD usually termed 'hospital at home' or Acute Respiratory Assessment Services (ARAS) led by nurse specialists. Patients with high pyrexia, severe tachypnoea or tachycardia, clinical or radiological evidence of pneumonia, severe hypoxia or acidosis, acute confusion, or inadequate social support are excluded (i.e. admitted to hospital for standard care) [**12–14**, 15, **16**, 17]. If the patient satisfies these evidence-based entry and exclusion criteria for hospital at home support he/she is allowed home with a full package of treatment, which may include antibiotics, corticosteroids, nebulised bronchodilators and if necessary oxygen (by concentrator on loan) and is supported with daily home visits by a respiratory nurse until discharge from the scheme (at least 3 days).

Many AECOPD patients can be successfully managed by respiratory nurses at home in a similar manner to conventional inpatient hospital care, with no excess mortality. Follow-up data reveals no difference between hospital care and ARAS schemes in terms of hospital re-admission or use of other services, for example attendance by general practitioners.

Patients' and GPs' satisfaction in the above studies was generally reported as good. Indeed Ojoo and co-workers [17] investigated patients' and carers' preferences for hospital or ARAS care in some detail. AECOPD patients were randomised to ARAS *versus* standard inpatient hospital care. Patients' preference for care during future episodes of

AECOPD strongly favoured ARAS (96.3%) in those who had experienced the domiciliary arm. Even among those who had experienced the conventional arm 59.3% said they would prefer ARAS care in the future. Similar figures were seen in the carers of the respective groups.

The ARAS model is spreading rapidly across UK practice, fuelled by the perceived need to reduce length of hospital stay, the drive for intermediate care initiatives for elderly patients and proven cost-effectiveness [18], and supported by a strong evidence base.

Pulmonary rehabilitation

The national and international situation is however less encouraging when it comes to the equally well-evidenced area of pulmonary rehabilitation. A wealth of studies have shown that outpatient pulmonary rehabilitation improves exercise capacity and health-related quality of life, reduces physical disability [19, 20], reduces hospital admission and is cheaper than inpatient rehabilitation [21, 22]. However a recent UK national study [**23**] from our department, which investigated the availability of pulmonary rehabilitation programmes in UK revealed that only one-third of acute hospitals provide such programmes. In addition the mean age of subjects in existing pulmonary rehabilitation programmes was usually under 70 years, despite the demographic characteristics of the condition. Two other national surveys (from the USA and Canada) have reported similar findings [24, 25]. These three surveys taken together suggest that only 1–2% of all COPD sufferers have access to pulmonary rehabilitation per annum, a finding that, given the evidence base, physicians, geriatricians and healthcare providers in general cannot be proud of.

Maximising independence

Improving independence within the community may improve exercise capacity in patients with COPD. It has been hypothesised that outreach care in the community by respiratory nurses may increase compliance in self-management behaviour with improved knowledge of the disease, of medication usage, and of inhaler technique, and (possibly) by enabling earlier self-identification of signs of exacerbation. However a Cochrane review by Smith and colleagues [26] of home care by outreach nursing teams was inconclusive in its findings. Some benefit was reported in health-related quality of life in moderate COPD patients but no improvements were noted in patients with severe COPD, and the intervention failed to reduce hospital readmission [26, 27]. Others have reported self-management education has no effect in reducing hospital admissions, days lost from work and lung function decline in patients with COPD, but have shown some benefits in reduced usage of rescue medication [28]. This area needs more exploration in elderly patients.

Pharmacotherapy advances

Tiotropium is a new-generation, long-acting (once daily administration) anticholinergic bronchodilator with M_1 and M_3 receptor subtype selectivity. In a variety of recent clinical trials in patients with COPD it has achieved superior bronchodilatation and greater improvements in dyspnoea and quality of life than salmeterol, together with reduction in exacerbation frequency and time to first exacerbation [29–32, **33**, **34**]. However in all the above studies the mean age of patients was 66 years or less, despite the fact that, with ageing, muscarinic activity becomes a relatively more important influence on airway tone than beta-receptor activity [35] (i.e. tiotropium would be expected to have even greater relative benefits over beta-agonists in the elderly). Furthermore, the inhaler device through which the drug is delivered requires a relatively complex series of manoeuvres to activate it, and there are as yet no published data concerning its use in elderly patients. Tiotropium, as the first bronchodilator consistently shown to affect exacerbation rate and improve quality of life, may prove to be a major therapeutic advance in COPD, but the evidence base in the elderly needs development.

After several years of debate concerning the potential disease-modifying effect of inhaled corticosteroids in COPD (i.e. whether they slow the rate of increase in airways obstruction) several large, well-conducted trials have clearly shown no benefit in this regard [**36**, **37**, 38, 39]. Nonetheless the place of inhaled steroids in *severe* COPD (FEV1 less than 50% of predicted), where repeated exacerbations are common, is now proven. Inhaled steroids, when given regularly to this patient subgroup (which includes very many elderly patients) improve quality of life and reduce exacerbation frequency [39, **40**]. Those of us who have spent many years trying to get our elderly patient with irreversible COPD off inhaled steroids will need to think again and change our practice.

Non-invasive positive pressure ventilation

Recent British Thoracic Society guidelines recommend non-invasive positive pressure ventilation (NIPPV) for patients admitted with hypercapnic respiratory failure secondary to acute exacerbation of COPD, as an acceptable and practical alternative to intubation and invasive ventilation [**41**], in those without *severe* acidosis, i.e. *not* recommended for those with arterial pH below 7.25 (in such patients invasive ventilation is recommended if clinically appropriate). Two meta-analyses [**42**, **43**] have confirmed NIPPV as the first line intervention in selected patients admitted with acute exacerbations and with respiratory failure, to supplement standard medical care. These reviews further reported that early intervention with NIPPV has the potential to reduce length of stay, decrease the rate of endotracheal intubation and may prevent intensive care admissions and reduce in-hospital mortality. A large UK randomised controlled trial found that NIPPV was highly cost effective and reduced mortality compared to standard treatment [44]. Non-invasive ventilation needs to be carried out in defined units with expertise in its use, though not necessarily in intensive care or high dependency units [**45**]. Although few very elderly patients have been included in the trials there is little reason to suppose they will benefit to any lesser degree (though again more research in this age group is needed).

The service is currently expanding rapidly across the UK, and it thus behoves geriatricians to become familiar with this facility in order to ensure fair access for their elderly patients. There is clearly an ethical issue in terms of those not considered suitable for invasive ventilation who are nonetheless given a trial of NIPPV, and more evidence regarding patients' and relatives' attitudes to this is needed.

Summary

Hospital at home schemes are an alternative strategy to reduce length of hospital stay, and are safe and acceptable to patients and carers in selected patients referred to hospital with acute exacerbations of COPD. Current pulmonary rehabilitation provision in the UK is inadequate and provision of the service for those who are aged 70 years and above is limited. Tiotropium is a promising drug for patients with COPD, improving quality of life and reducing dyspnoea and frequency of exacerbations. Its efficacy in older patients is worthy of investigation. Early NIPPV intervention in those patients admitted with acute exacerbations and with respiratory failure improves quality of life and reduces inpatient hospital mortality.

Key points

- Hospital at home services reduce hospitalisation and length of stay for elderly patients with AECOPD.
- The provision of pulmonary rehabilition services for older people in the UK is currently inadequate.
- Both inhaled corticosteroids and the long-acting muscarinic antagonist tiotropium have a place in reducing exacerbation rate and improving quality of life in selected patients.
- Early NIPPV during hospitalisation for AECOPD reduces mortality and improves quality of life.

Conflicts of interest

Dr Connolly is a member of the Respiratory Section of the British Geriatrics Society. The Respiratory Section receives organisational support and funding for its meetings from Allen and Hanbury's Ltd. Dr Connolly is (or has been) in receipt of research grants from Boehringer Ingelheim, Glaxo Inc USA, Ciba-Geigy, Allen and Hanbury's Ltd, The Astra Foundation, Merck Sharpe and Dohme, Pfizer UK and Schering AG.

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PLEASE NOTE: The very long list of references supporting this Clinical Update has meant that only the most important are listed here and are represented by **bold type** throughout the text. The full list of references is available on the journal website (http://www.ageing.oupjournals.org/).

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Received 26 September 2003; accepted in revised form 12 February 2004