Primary Care Respiratory Society UK - Opinion No.16

Opinion

The management of exacerbations of chronic obstructive pulmonary disease in primary care

Definition of an acute exacerbation of Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease (COPD) is a slowly progressive condition characterised by episodes of acute exacerbations, which have dramatic effects on the patient. An exacerbation of COPD is defined as "a worsening of the patient's condition, from the stable state and beyond normal day-to-day variation that is acute in onset and necessitates a change in regular medication".[1] Typically, patients will present with acute increasing dyspnoea combined with a productive cough and a change in the amount, viscosity, and colour of their sputum.[2]

Exacerbations range in severity from mild (causing few problems) to severe (associated with respiratory failure and hospital admission). There is evidence to suggest that up to 50% of patients suffering from an acute exacerbation will not report to a health care professional.[3] Even mild exacerbations may be important and are associated with impaired health status and decline in lung function. While there is no formal classification of severity, one can classify exacerbations in terms of health care utilisation, ranging from mild (self-managed) to those involving unscheduled care:

- Visit to GP
- Out of hours visit
- A&E attendance
- Hospital admission

Cost of care

The cost of managing COPD within our society is huge, with direct costs to the National Health Service (NHS) estimated at over £800 million. Most of the costs are due to acute exacerbations. In the UK the average cost of an admission to hospital for an acute exacerbation of COPD based on current tariffs is £1,960.[4] Of the direct costs 60% are attributable to the management of acute exacerbations of COPD, and most of this is spent on secondary care treatment. In comparison, 19% of costs are for treatment, 16% for routine GP and specialist care, 6% for unscheduled consultations and 5% for investigations.[5]

Reducing the frequency and severity of acute exacerbations of COPD by adopting a proactive approach centred on the patient will not only benefit the patient but also makes good financial sense.

Management of acute exacerbations within primary care

The proactive approach to managing acute exacerbations with patients encompasses four aspects:

1. Reducing exacerbation frequency
2. Providing self-management advice for patients suffering an exacerbation of COPD
3. Assessing and appropriately managing an exacerbation
4. Ensuring correct follow up of patients following an exacerbation

Reducing exacerbation frequency

The National Institute for Health and Clinical Excellence (NICE) guidelines (2010)[6] examined the evidence base for the use of Inhaled corticosteroids, inhaled combination inhalers (inhaled corticosteroid and long-acting beta agonist) and inhaled long-acting muscarinic antagonists (LAMA) in reducing exacerbations rates in patients with COPD. The Uplift study showed that the use of a LAMA (tiotropium) significantly reduced exacerbations compared to usual COPD care. The control group of usual care included patients on ICS and long-acting beta agonists (LABAs) but excluded those on an anticholinergic inhaler.[7] In addition the Inspire study showed comparable rates of acute exacerbations in patients taking either a combination inhaler or a LAMA.[8] From this evidence it is proposed that combination inhalers (ICS+LABA) or a LAMA should be used in patients with an FEV_1<50% who remain breathless or suffer from exacerbations despite being on either a short acting bronchodilator or a LABA. Indeed in patients with a FEV_1<50% predicted who are already on one of these inhalers and continue to have breathlessness or recurring exacerbations, it is recommended that both inhalers should be used. Analysis of adverse events in the Torch and Inspire studies raised concern about a greater incidence of pneumonia rates in patients treated with inhaled corticosteroids (either alone or in combination inhalers)[9,10] though the trials were not powered to look specifically at this potential adverse outcome. A recent Cochrane review estimated a Number Need to Harm of 17 over 3 years for use of inhaled corticosteroids in COPD patients.[11]

A recent trial suggested that daily use of azizthromycin significantly reduced acute exacerbations (from 1.48/ patient / year down to 1.83/patient per year).[12] There is other evidence also suggesting that macrolide antibiotics have additional anti-inflammatory action and indeed one single-centre, double-blind trial of erythromycin 250 mg twice a day over 1 year reported a 35% reduction in exacerbations.[13] However this evidence has not been incorporated, as yet into national guidelines.

Pneumococcal vaccination and annual influenza vaccination are recommended for patients with COPD by both the Chief Medical Officer and by NICE guidelines. Although the evidence base is stronger for the impact of influenza vaccination on reducing COPD exacerbations than that for pneumococcal vaccination, both are highly recommended with all patients with COPD.

Providing self-management advice

The evidence base for the use of self-management plans (SMPs) is conflicting and sparse. However, there is evidence from a Cochrane review in 2004 that the prompt administration of oral steroids within three days of onset will reduce breathlessness and improve recovery time.[14] There is also evidence on the prompt use of broad-spectrum antibiotic in reducing the recovery time from an acute exacerbation and reducing subsequent mortality.[15] This evidence would suggest that the most simple SMP would entail advice on when to take these drugs at the onset of an acute exacerbation. Therefore, in patients with moderate to severe COPD who have a history of recurrent exacerbations, the provision of a home supply of a broad-spectrum antibiotic and oral steroid would empower patients to start these therapies at an earlier phase of an acute exacerbation.

Instructions on when to alert a clinician following self-administration needs to be an integral part of the plan. Thus the steps involved in a patient SMP should include:

- Instruction on increasing bronchodilator use to the maximum
- Commencement of oral steroids if symptoms persist (30mg of prednisolone for 7-10 days)

Table 1. Factors favouring management at home. Adapted from NICE Guidelines[6]

Able to cope at home	Yes
Breathlessness	Mild
General Condition	Good
Level of activity	Good
Cyanosis	No
Worsening peripheral oedema	No
Level of consciousness	Normal
Already receiving long-term oxygen therapy (LTOT)	No
Social circumstances	Good
Acute confusion	No
Rapid rate of onset	No
Significant co-morbidity (particularly cardiac disease and/or Type 1 diabetes)	No
SaO_2 <90%	No
Chances on Chest X-ray	No

- Starting a course of a broad spectrum antibiotic if the sputum becomes purulent
- How to recognise features of an exacerbation which indicate the need for urgent action e.g. when to call an ambulance
- Follow-up arrangements

An example of a SMP can be viewed in our COPD Self Management opinion Sheet – see http://www.pcrs-uk.org/resources/os11_copd_self_man.pdf

Assessing and appropriately managing an exacerbation

The first response to an acute exacerbation should be from the patient in line with their SMP. However, many patients present with previously-undiagnosed COPD. Patients presenting with features of an acute exacerbation of COPD should be seen as soon as reasonably possible since deterioration of their clinical state can be rapid. Thus, patients who are known to have a history of exacerbations should be flagged within practices so that they are identified early and can be fast tracked to consult their usual clinician. It is important to take a full clinical diagnosis to confirm both the previous diagnosis of COPD and the presence of an acute exacerbation. Whether a patient can be managed at home requires a full assessment. Factors that would suggest that admission to hospital for further assessment and management is necessary include:

Clinical history

- Unconfirmed or ambiguous diagnosis
- Poor social support
- Confusion and drowsiness
- Unremitting dyspnoea
- Chest pain

Clinical examination

- Pyrexia (and/or a history of rigors)
- Cyanosis
- New onset of peripheral oedema
- Co-morbid conditions - such as uncontrolled heart failure or diabetes Investigations
- New onset of peripheral oedema
- Co-morbid conditions - such as uncontrolled heart failure or diabetes

Investigations

- Worsening hypoxia
- Pulse oximetry ≤ 90%

The decision to treat at home should also be influenced by the clinician's experience and confidence in managing acute exacerbations, their ability to provide accessible regular assessments during the exacerbation period, the services available to support the patient within their own homes, and the safety of the patient throughout the exacerbation period. There are a number of assessment tools available for clinicians in assessing the appropriateness of home management as opposed to hospital admission (see Table 1).

If managing the patient at home, it is incumbent on the clinician to assess the patient regularly at an appropriate frequency (which may be daily until the patient's condition is stable), to ensure that they are being treated with appropriate therapies according to their action plan, and to ensure appropriate review and subsequent referral following the exacerbation. NICE also recommends the use of the anti-viral drug, oseltamivir, during flu endemics - although administration should be within 48 hours of the onset of symptoms. Zanamivir is not recommended in these circumstances as it may induce bronchospasm.

Practice protocols detailing the treatment and management of acute exacerbations can help to facilitate best practice and ensure consistency of care. The PCRS-UK have produced a protocol for the management of acute exacerbations which can be adapted by general practices.[16]

Ensuring correct follow-up of a patient following an acute exacerbation

It can take at least six weeks for a patient to recover fully from an acute exacerbation of COPD.[6] Following an exacerbation a full review should be performed. Essential aspects of this review should include:

1. Ensuring the patient is on optimal medical therapy in line with NICE guidelines
2. Education to discuss self management and if appropriate smoking cessation
3. Referral to pulmonary rehabilitation - if not undertaken before and if they fulfil criteria i.e. on optimised treatment and functionally disabled (MRC score ≤ 3)
4. Assessment of O_2 needs - either for long term O_2 therapy or ambulatory O_2.

References

1. Rodiguez-Roisin R. Toward a consensus definition for COPD exacerbation. *Chest* 2000;**117**(Suppl 2);S398-S401
2. Anthonisen NR, Manfreda J, Warren CP, *et al*. Antibiotic therapy in exacerbations of chronic obstructive pulmonary disease. *Ann Intern Med* 1987;**106**:196-204.
3. Seemungal TA, Donaldson GC, Paul EA, *et al*. Effect of exacerbation on quality of life in patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 1998;**157**:418-22.
4. National Institute for Health and Clinical Excellence. Chronic obstructive pulmonary disease. Costing Report. NICE: 2011
5. National Collaborating Centre for Chronic Conditions. National clinical guideline on the management of chronic obstructive pulmonary disease in adults in primary and secondary care. *Thorax* 2004;**59**(Suppl1):1-232.
6. National Institute for Health and Clinical Excellence (NICE) 2010. Chronic Obstructive Pulmonary Disease: national clinical guidelines for management of chronic obstructive pulmonary disease in adults in primary and secondary care. http://www.nice.org.uk/guidance/index.jsp?action=download&o=46091
7. Decramer M, Celli B, Kesten S, *et al*, Effect of tiotropium on outcomes in patients with moderate chronic obstructive pulmonary disease (UPLIFT): a prespecified subgroup analysis of a randomised controlled trial. *Lancet* 2009;**374**:1171-8.
8. Wedzicha JA, Calverley P, Seemungal TA, *et al*. The prevention of chronic obstructive pulmonary disease exacerbations by salmeterol/fluticasone propionate or tiotropium bromide. *Am J Respir Crit Care Med* 2008;**177**:19-26.
9. Crim C, Calverley PM. Anderson JA, *et al*. Pneumonia risk in COPD patients receiving inhaled corticosteroids alone or in combination: TORCH study. *Eur Respir J* 2009;**34**:641-7.
10. Calverley PM, Stockley RE, Seemungal TA, *et al*. Reported pneumonia in patients with COPD: findings from the INSPIRE study. *Chest* 2011;**139**:505-12
11. Nannini LJ, Cates CJ, Lasserson TJ, *et al*. Combined corticosteroid and long-acting beta-agonist in one inhaler versus long-acting beta-agonists for chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews* 2007, Issue 4. Art. No.:CD006829. DOI: 10.1002/14651858.CD006829
12. Albert RK, Connett J, William C *et al*. Azizthromycin for prevention of exacerbations in COPD. *N Engl J Med* 2011;**365**:689-98.
13. Seemungal TA, Wilkinson TM, Hurst J, *et al*. Long-term erythromycin therapy is associated with decreased chronic obstructive pulmonary disease exacerbations. *Am J Respir Crit Care Med* 2008;**178**:1139-47.
14. Wood-Baker RR, Gibson PG, Hannay M, *et al*. Systemic corticosteroids for acute exacerbations of chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews* 2005;Art. No.: CD001288. doi:10.1002/14651858.CD001288.pub2.(1).
15. Ram FSF, Rodriguez-Roisin R, Granados-Navarrete A, *et al*. Antibiotics for exacerbations of chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews* 2006;Art. No.: CD004403. doi:10.1002/14651858.CD004403.pub2.(2).
16. Reilly S. Management of Acute Exacerbations of COPD. Protocol No. 2. Available from http://www.gpiag.org/nurses/protocol02_exacerbations_final.pdf
17. O'Donnell DE, Parker CM. COPD exacerbations. 3: Pathophysiology. *Thorax* 2006;**61**:354-61.

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