Managing acute asthma in primary care

In this article...

- Causes of acute exacerbations in asthma
- What to offer if an exacerbation is suspected
- Follow-up treatment and advice to be offered after the episode

**5 key points**

1. Asthma is inflammation of the airways associated with hyper-responsiveness of the airway smooth muscle
2. Exacerbations of asthma can occur frequently and have a number of causes, the most common being viral infections
3. When presenting with exacerbations, patients should be assessed so follow-up can be carried out to ensure recovery is taking place and to facilitate patient education
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5. Patients with a written asthma action plan tend to have fewer exacerbations

Asthma is characterised by inflammation of the airways, associated with hyper-responsiveness of the airway smooth muscle. Typical symptoms are breathlessness, wheezing and coughing. Many patients achieve good levels of control but others do not, putting them at risk of acute exacerbations. This can lead to increased hospital admissions and, in more extreme cases, episodes of respiratory failure and even death; 1,143 people died from acute asthma in 2010 (Asthma UK, 2013).

Defining an exacerbation

An exacerbation is a deterioration in the level of control experienced by a person with asthma. The level and duration of deterioration is important and a full history should be obtained to help identify whether the person is normally well – has the asthma been like this for a period of weeks or months or, if it is usually well controlled, has a loss of control happened over the past few days? Both of these scenarios may have similar, if not identical, clinical presentations. Tattersfield et al (2004) found the pattern of deterioration in 425 exacerbations started around eight days before presentation and that it took a similar amount of time to get back to the previous level of control.

Current UK guidelines published by the British Thoracic Society and the Scottish Intercollegiate Guideline Network categorise exacerbations of asthma as moderate, severe and life threatening, based on the features with which patients present (BTS and SIGN, 2012) (Table 1).

Assessment

As discussed above, taking a detailed history is essential. Box 1 lists the main questions to ask during an exacerbation.

BTS and SIGN (2012) guidelines advise checking the following parameters, once an adequate history has been taken:

- Respiratory rate;
- Pulse rate;
- Peak expiratory flow (PEF);
- Pulse oximetry;
- Any treatment the patient may have self-administered before presenting.

After this initial assessment, it is possible to categorise the patient based on the criteria in Table 1 and decide on the management plan. Patients with even one feature of life-threatening asthma will need to be admitted to hospital. Those with moderate asthma exacerbation (especially if the...
parameters are not excessively abnormal) may be able to be treated in primary care and return home, but must be reviewed.

Patients experiencing severe symptoms need prompt treatment. However, some sort of assessment should be made so treatment efficacy can be measured. Pulse rate is easily measured; treatment that relieves hypoxaemia will raise oxygen saturations and reduce pulse rate, providing evidence of a treatment’s effectiveness. Finding out what has been done before presentation is also important; patients who present with features of acute severe asthma and say they have self-administered a bronchodilator without effect should be given further bronchodilators and admitted to hospital.

**Management**

BTS and SIGN (2012) give detailed advice on the management of acute exacerbations. A beta<sub>2</sub> agonist such as salbutamol should always be given initially. These bronchodilators bind to receptors on airway smooth muscle and induce relaxation, which increases airflow and reduces hypoxaemia. An initial dose of four puffs of beta<sub>2</sub> agonist via a pressurised metered dose inhaler (pMDI) should be administered as single actuations (BTS and SIGN, 2012). This mode of delivery is possible only with salbutamol; terbutaline is available only in a dry-powder inhaler so using a spacer is not possible. Dry-powder devices need a greater inspiratory flow on the part of the patient; this may be limited by severe exacerbations so, if using these devices, lung deposition of beta<sub>2</sub> agonists may be limited.

Patients can use either one or multiple (ie 3-4) breaths. Beta<sub>2</sub> agonists work rapidly, usually within 3-4 minutes, and reach peak activity after approximately 15 minutes. Patients who do not respond in this time should have further treatment of two puffs every two minutes up to a maximum of 10 puffs. A further option is to administer ipratropium bromide 0.5mg in addition to further beta<sub>2</sub> agonists. If a patient does not respond to initial treatment, an ambulance should be called.

Many patients with acute severe asthma are hypoxic so pulse oximetry is an essential part of assessment (BTS and SIGN, 2012). Hypoxia should be managed with supplemental oxygen administered via a face mask, venturi mask or nasal cannula, with flow rates adjusted to maintain an SpO<sub>2</sub> of 94-98%. Nebulisers should be driven by oxygen, as there is a risk of desaturation when using air-driven devices (BTS and SIGN, 2012).

Some clinicians may choose to administer bronchodilators by nebuliser. However, BTS and SIGN (2012) advise using a pMDI and spacer for moderate exacerbations, and nebulisers for acute severe asthma and life-threatening asthma (although pMDIs and spacers can also be used in these circumstances).

As a general rule, patients with an acute asthma exacerbation should be assessed, given initial treatment in the form of bronchodilators administered via pMDI and a spacer, and given oxygen if they are hypoxic. They should be considered for hospital admission if unresponsive to initial treatment or if they have any features of acute, severe or life-threatening asthma. Admission should also be considered if:

- Symptoms are significant and persistent;
- There are concerns about adherence to treatment;
- They live alone or are socially isolated;
- They have psychological problems;
- They have a physical disability or learning difficulties;
- They have had previous near-fatal or brittle asthma;
- Exacerbation has occurred despite adequate doses of steroid tablets before presentation;
- They have presented at night;
- They are pregnant (BTS and SIGN, 2012).

If it has been decided to admit a patient to hospital, written details of the assessment and treatments already provided should be given to the paramedics or admitting staff. Although there is no specific guidance on further observations, it would be sensible to monitor respiratory and pulse rates every 15 minutes and, if possible, PEF. There is no specific guidance on when patients are well enough to be discharged.

**Further management**

If the decision has been made not to refer a patient to secondary care, several issues need to be considered (listed below).

**Self-management**

Self-management should be discussed with the patient and any carers, particularly with regard to inhaler technique. This should be checked routinely and corrected if, or if this is not possible, a new device prescribed and the patient taught and assessed in its use. This is essential generally, and especially so after an exacerbation.

**Reliever medication**

Advice should be given on reliever medication (salbutamol or terbutaline). Patients should be advised they may need to use this more often or feel they get little benefit from it; this might be a sign their asthma is deteriorating and they should seek help.

**Oral corticosteroids**

Patients should be given a course of oral corticosteroids (OCS). BTS and SIGN advise a daily dose of 40-50mg for five days or until recovery (some patients may not recover fully in five days). One study of asthma exacerbations found it took around eight days for patients to return to their baseline status (Tattersfield et al, 2004). It may be beneficial to extend the OCS course for patients who are still symptomatic after five days as some may relapse soon after, requiring another course of OCS and increasing exposure to OCS more than necessary. Patients should be reviewed on the final day of the OCS.
Discussion

Review
The patient should be reviewed in 24 hours and on the last day of the OCS course. No specific method is advised by guidelines but it seems reasonable to carry out the 24-hour review face to face or by telephone. This is to establish that recovery is maintained (symptom resolution has been maintained and, where possible, the patient reports an increase in PEF), to ensure the patient is adhering to the OCS course, and to remind them to attend for review on the OCS course’s last day.

Issues not already dealt with should be addressed at the review on the final OCS day. This includes identifying the cause of the exacerbation, which may have resulted from continued poor control generally; the cause of the poor control should be identified. Common reasons are poor adherence to inhaled corticosteroid (ICS) regimens and poor inhaler technique. Other factors include smoking (which impairs ICS efficacy), suboptimal treatment and coexisting allergic rhinitis, which increases the likelihood of an exacerbation if not optimally controlled (Corren et al, 2004).

Some exacerbations may have no obvious cause and patients report a fairly rapid deterioration with no obvious trigger. Little can be done here, apart from reinforcing appropriate behaviours and, if there has been delay in seeking help, advising using a written action plan. The biggest cause of asthma exacerbations is viral infections (Wark and Gibson, 2006).

Inhaled corticosteroids
A proven way to reduce exacerbations is through the use of ICS (Fitzgerald and Gibson, 2006). BTS and SIGN (2012) advocate prescribing these where patients have had an exacerbation requiring OCS in the past two years. It is essential to prescribe ICS for patients who present with an acute exacerbation and are not receiving them.

A number of studies have found that patients with written asthma action plans have fewer exacerbations, less time off work, use reliever medication less, have better adherence with ICS, and have better lung function (Gibson and Powell, 2004).

Conclusion
Acute asthma exacerbations are common. Causes are varied, ranging from viral infections to people who may be “exacerbation-prone phenotypes”. Guidelines advise a thorough assessment followed by standard treatment with oxygen where necessary, and inhaled bronchodilators via pMDI and spacer, or oxygen-driven nebuliser in more severe episodes. Several factors, both medical and psychosocial, influence whether a patient is admitted to hospital. Those who are managed in primary care should be reviewed on the final day of the OCS course to optimise management, reinforce self-management strategies and agree a written asthma action plan.

References