Guidelines for management of asthma in adults: I—chronic persistent asthma

Statement by the British Thoracic Society, Research Unit of the Royal College of Physicians of London, King's Fund Centre, National Asthma Campaign

The morbidity and mortality associated with asthma are unacceptably high in Britain. Many deaths and much unnecessary morbidity have been connected with underuse of inhaled and oral corticosteroids, underuse of objective measurements of severity, and inadequate supervision.[1-3] As a result of an initiative from the British Thoracic Society, the research unit of the Royal College of Physicians of London, the King's Fund Centre, and the National Asthma Campaign a group of interested physicians and general practitioners was brought together to produce guidelines for the management of asthma in adults. This paper gives guidance on the management of chronic persistent asthma. Guidelines for the management of acute severe asthma will be published in next week's issue.

The recommendations for chronic persistent asthma promote greater use of anti-inflammatory drugs, even in patients with apparently mild asthma; objective monitoring of the progress of asthma using the patients' own measurements of peak expiratory flow; and greater participation of the patient in the management of the condition.

Description of asthma

Asthma is a common and chronic inflammatory condition of the airways whose cause is not completely understood. As a result of inflammation the airways are hyperresponsive and they narrow easily in response to a wide range of stimuli. This may result in coughing, wheezing, chest tightness, and shortness of breath; these symptoms are often worse at night. Narrowing of the airway is usually reversible, but in some patients with chronic asthma the inflammation may lead to irreversible obstruction of air flow.

Characteristic pathological features include the presence in the airway of inflammatory cells, plasma exudation, oedema, hypertrophy of smooth muscle, mucus plugging, and shedding of epithelium. These changes may be present even in patients with mild asthma when they have few symptoms.

Aims of management

The aims of management in adults are to recognise asthma, abolish symptoms, and restore normal or best possible long term function of the airways and reduce the risk of a severe attack. This last aim should be achieved by avoiding recognised causes if they exist and by using the lowest effective doses of convenient treatments with minimal short and long term side effects.

A list of participants is given at the end of this paper

Correspondence to: British Thoracic Society, 1 St Andrew's Place, London NW1 4LB.

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Management of chronic persistent asthma

As asthma is a chronic inflammatory condition anti-inflammatory drugs should be given to most patients. Treatment should be considered in a stepwise manner as described below, with the patients starting treatment at the step most appropriate for the initial severity of their condition. A short course of oral corticosteroids may be needed at any time and at any step to control their asthma (see box).

Treatment with short course of oral steroids

Short courses of oral steroids may be needed to control exacerbations of asthma at any step. Indications are:

- Symptoms and peak expiratory flow get progressively worse each day
- Peak expiratory flow falls below 60% of patient's best result
- Sleep is disturbed by asthma
- Morning symptoms persist until midday
- Maximum treatment not including oral steroids does not work
- Emergency nebuliser or injected bronchodilators are needed

Give patients prednisolone 30-60 mg daily (60 mg if they are already taking oral steroids) until two days after full recovery, when the drug may be stopped or the dose tapered.

If arranged beforehand short courses of oral steroids may be started on the patient's initiative according to written guidance.

Avoidance

If agents such as allergens, occupational sensitising chemicals, and certain drugs—for example, aspirin and non-steroidal anti-inflammatory drugs—are known to induce asthma in a patient they should be avoided if possible. β Blockers are contraindicated in patients with asthma. Avoidance of day to day triggers such as exercise and cold air generally imposes inappropriate restrictions on lifestyle, and it may be preferable to adjust treatment to cover exposure to these. Smoking should be avoided.

(1) Bronchodilators

A β_2 agonist (such as salbutamol 100-200 μg or terbutaline 250-500 μg) should be used as required rather than regularly. Inhalation is the preferred means of administration: the drug is delivered direct to the airway, doses are small, and side effects are minimised. In patients with normal lung function who have only infrequent symptoms and no sleep disturbance this may be the only treatment required.

(2) Inhaled anti-inflammatory agents

Patients who need to inhale a bronchodilator more than once daily or who have night time symptoms require regular inhaled anti-inflammatory drugs. Options include corticosteroids, sodium cromoglycate (5-20 mg four times daily), and nedocromil sodium

(4 mg four times daily). Inhaled steroids are the drugs of choice and should be started at a dose of beclomethasone dipropionate or budesonide 100-400 μg twice daily. Patients with persistent symptoms (especially nocturnal symptoms), a continuing need for inhaled bronchodilators, and suboptimal peak flow may need to receive a higher and more frequent dose of inhaled steroid for control to be achieved. Once symptoms and peak flow have improved, the dose of inhaled steroid is reduced to the minimum that maintains control. The daily dose may need to be increased from time to time in response to changes in symptoms and peak expiratory flow. For example, the dose of inhaled steroid might be doubled for one week if there is onset of upper respiratory infection. Patients who have not responded to cromoglycate or nedocromil should receive inhaled steroids as described above before moving to step 4.

(3) High doses of inhaled steroids

If control (as judged by symptoms, increased use of inhaled β_2 agonists, and peak expiratory flow) is not achieved compliance should be questioned and inhaler techniques checked, and if either of these is inadequate the same dose should be repeated with a large volume spacer device (such as a Nebuhaler or Volumatic) or a dry powder formulation given. The dose of inhaled steroid should be increased to a maximum daily dose of beclomethasone dipropionate or budesonide of 2 mg. A large volume spacer device is recommended to reduce oropharyngeal side effects and systemic absorption once the dose of inhaled steroids exceeds 800 μg daily. Sodium cromoglycate or nedocromil sodium may be considered in an attempt to minimise requirements for inhaled steroids.

(4) Additional bronchodilators

If adequate control of symptoms is not achieved with inhaled steroids 2 mg each day and standard doses of inhaled β_2 agonists (such as salbutamol 200 μg or terbutaline 500 μg four times daily) a trial of the addition of inhaled ipratropium bromide, oral bronchodilators, or high doses of inhaled bronchodilators may be considered.

Inhaled ipratropium bromide (80 μg four times daily) may be useful. A trial period of this treatment with monitoring of symptoms and peak expiratory flow is advised before long term treatment is recommended.

Oral β_2 agonists and xanthines should not be used as first line drugs. The main indication is the presence of symptoms, often at night, which are not controlled by high doses of anti-inflammatory drugs and standard doses of inhaled β_2 agonists. The addition of a single nocturnal dose of a slow release preparation may be adequate; a twice daily regimen may be necessary. Either treatment may be effective, and each may need to be tried. Xanthines should be used only at steps 5 and 6, and each patient should be shown to benefit from this treatment before long term treatment is continued. Monitoring of blood or saliva xanthine concentrations is advised. Long acting oral β_2 agonists should not normally be used without concurrent anti-inflammatory treatment.

High doses of inhaled bronchodilators should be considered only if the patient does not respond to standard doses. β_2 Agonists and anticholinergic agents can be given from prediluted phials through a nebuliser (for example, salbutamol $\leq$5 mg; terbutaline $\leq$10 mg; ipratropium $\leq$500 μg). The use of nebulisers without proper assessment and supervision is potentially dangerous. The guidelines for the safe use of nebulised bronchodilators are summarised in the box. As an alternative to use of a nebuliser high doses of bronchodilators may be given by multiple actuations of a metered dose inhaler with a large spacer device.

Guidelines for giving nebulised bronchodilators

Initial assessment

Before considering giving nebulised brochodilators:

- The diagnosis should be reviewed and confirmed
- Other methods of drug administration should be explored
- Patients should be complying with anti-inflammatory treatment
- Increased bronchodilatation without unacceptable side effects should be shown
- An initial home trial for three weeks with monitoring of peak expiratory flow should be undertaken

Supervision

- Verbal and written instruction should be given to the patient on the method and frequency of use, the action to be taken in the event of worsening asthma, and when to attend for follow up
- Supervision should normally entail attendance at an asthma clinic or home visits by a trained asthma nurse or physiotherapist
- Supervision should include evaluation of peak expiratory flow, monitoring of prescriptions, and biannual servicing of the compressor

Step down

The patient's requirement for treatment should be reviewed from time to time. If minimal symptoms, low rate of use of bronchodilators, and optimal peak expiratory flow suggest that asthma is well controlled a stepwise reduction in the dose of anti-inflammatory drugs may be possible. In patients whose treatment was recently started at step 4 or 5 or included oral steroids in order to gain control of asthma this reduction may take place after a short interval. In other patients with chronic asthma a six month period of stability should be shown before slow, stepwise reduction is undertaken. Monitoring of peak flow rate should be continued during such reductions, and patients should be given written instructions about the action to be taken if results get worse (see below). Rarely it may be possible to stop anti-inflammatory drugs completely.

Other treatment

Antihistamines, including ketotifen, have proved disappointing in clinical practice, despite giving good protection in patients undergoing acute challenge. Immunosuppressive treatment is currently under investigation but has not found its way into routine treatment. There is anecdotal evidence that some patients have benefited from the use of ionisers, acupuncture, homoeopathy, and other complementary treatment, but controlled clinical trials have so far been disappointing. Conventional treatment must be continued if these treatments are tried. Hyposensitisation (immunotherapy) is not indicated in the management of asthma.

(5) Maintenance treatment with oral corticosteroids

Maintenance treatment with oral prednisolone should be given only if adequate control cannot be achieved with maximum doses of inhaled steroids and bronchodilators. High doses of inhaled steroids should always be continued in patients receiving oral steroids. These patients should normally be referred to a hospital asthma clinic, where additional measures may be considered.

Guidelines for self management of asthma

The guidelines for self management of asthma are as follows.

(1) As far as possible patients should be trained to manage their own treatment rather than be required to consult their doctor before making changes.
(2) Patients should have a relevant understanding of the nature of asthma and its treatment. This would include:
- Training in the proper use of inhaled drugs and the use of a peak flow meter
- Knowledge of the difference between relieving and anti-inflammatory treatment
- Instruction to ensure recognition of signs that asthma is worsening, especially the importance of nocturnal symptoms and the changes in peak expiratory flow.

(3) Patients should be given adequate opportunity to express their expectations of treatment and to hear how far those expectations can be met. They should have a balanced view of the possible side effects of the treatments.
(4) Education and training of patients are the responsibility of the doctor but can profitably be shared with specially trained health care professionals. Advice should be consistent and repeated; it may be supported by written or audiovisual material. The patient should be acquainted with the resources of the National Asthma Campaign.
(5) Patients who have required or who are likely to require a course of systemic corticosteroids should be trained to initiate or increase doses of inhaled and oral corticosteroids themselves under specified prearranged circumstances, as outlined in a self management plan.
(6) The three elements of a self management plan are (*a*) monitoring of symptoms, peak flow, and drug usage, leading to (*b*) the patient taking prearranged action according to (*c*) written guidance. Such self management plans should be carefully discussed with the patient and written down individually or by using a National Asthma Campaign adult asthma card. The plans should include information about how and where to obtain urgent medical attention.
(7) Patients should regard the plan of management as subject to a process of continuing but orderly review in which they play an active part. Review of a patient's progress at a prearranged visit to the doctor should include:
- Symptoms—especially nocturnal
- Interference with normal activities (for example, work loss)
- The patient's own record of treatment changes
- Peak flow recordings
- Understanding of asthma
- Understanding of management
- Inhalation skills
- The action to be taken by the patient if signs of deterioration develop.

(8) Requests for help from a patient with asthma should be accorded high priority by doctors. Other health care workers should be aware that medical help may be required promptly in the event of worsening asthma.

Referral to chest specialist

Referral to a specialist should be considered for:
(i) Patients in whom there is doubt about the diagnosis—for example, the elderly and smokers or former smokers with wheeze in whom diagnosis may be difficult, and those with unexplained persistent cough
(ii) Patients with possible occupational asthma
(iii) Patients with asthma who present a problem in management—for example, those who have recently been discharged from hospital; those with catastrophic, sudden severe (brittle) asthma; those with continuing symptoms despite high doses of inhaled steroids; those being considered for long term treatment with nebulised bronchodilators; pregnant women with worsening asthma; and patients whose asthma is interfering with their lifestyle.

Patients with asthma need regular supervision and support by a doctor who is knowledgeable about the condition. Arrangements for referral and long term care vary from district to district and according to the special interests of general practitioners, but there should be regular liaison between hospital and community asthma services.

In general it is inappropriate for patients with chronic asthma to be followed up for long periods in hospital outpatient clinics, where the physician has no special interest in the condition or patients are seen by members of junior staff who receive no specialist training in the condition or who rotate through the post at frequent intervals.

Participants in the development of the guidelines were—Dr D Costain, Dr B D W Harrison, Professor S T Holgate, Dr A P Hopkins, Dr M R Partridge (members of the organising committee); Professor P J Barnes, and Drs R A L Brewis, C E Bucknall, H R Gribbin, D J Lane, E Neville (who prepared the initial draft statements); and Dr S P Allison, Dr A H Barnett, Professor T J H Clark and Drs C K Connolly, G K Crompton, J Donaldson, C C Evans, A D Ferguson, J A R Friend, S R Hilton, W F Holmes, K Jones, S Kenwright, M W McNicol, R L Page, C F A Pantin, M G Pearson, M Rudolf, A Smith, J E Stark, G O Thomas, Professor M E Turner-Warwick, and Dr C Waine.

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MATERIA INDOMEDICA

Losing a skirmish to win the battle

A surgical department in a public hospital was inspected, some time ago, by a senior civil servant. Hospital officials permitted this worthy to enter the operating theatres without changing his clothes and shoes. When the surgical consultant learnt of this he closed down the theatres for resterilisation. To prevent a similar outrage in the future he complained to the hospital administrator, protesting vigorously against the breach of surgical discipline. The administrator, under the thumb of the civil servant, made a verbal apology but seemed to consider the matter closed. The surgeon, seething, continued his protests a while and then simmered down. He erected barriers and tightened security at his theatres, making it difficult for anyone to enter without changing. The hospital administrator was kept informed of all these actions.

A few months later the surgeon requisitioned ultraviolet lamps and other equipment for improving asepsis. To his surprise these were provided speedily. Other requests made to improve facilities in the theatres were also granted and acted on with alacrity. A committee was set up to standardise operating theatre techniques and this surgeon was placed on it. As time passed it became evident that the hospital administrator, unable to protest against the behaviour of the civil servant but none the less aware of the consequences of his action, was more than making amends. A lesson was learnt. It may, at times, be wise to lose a skirmish in order to win the battle.—SUNIL PANDYA