ASTHMA IN THE ELDERLY

Michael Plit, *MB BCh, FCP(SA), FCCP*

Centre of Chest Diseases, Milpark Hospital, Johannesburg, South Africa

ABSTRACT

Asthma in the elderly is not uncommon. Patients have a poor perception of obstruction and are underdiagnosed and undertreated.

Management is made difficult by increased sensitivity to bronchodilator drugs and difficulty in using the inhaler devices.

Clinical reviews of asthma in several countries have all demonstrated that the disease is underdiagnosed, underassessed and undertreated.[1] This problem is exaggerated in the elderly, since there is a general perception that asthma is a disease of children and young people and is not generally associated with the elderly.[2]

The prevalence of the disease in the elderly is difficult to assess, since confirmation with definitive lung function studies, reversibility testing and bronchoprovocation tests are infrequently performed.

Many adults over the age of 60 years often admit to symptoms of a respiratory nature including cough, wheeze and breathlessness. In older adults these symptoms are poorly predictive of asthma since other diseases including chronic obstructive pulmonary disease (COPD), and ischaemic and hypertensive heart disease may be associated with similar symptoms.

Older people (unlike younger subjects) are less able to perceive increasing bronchoconstriction demonstrated by less response to resistance loading.

This may delay seeking assistance until the disease is at a more advanced stage. Social isolation and cognitive impairment may contribute to underdiagnosis.

STATISTICS

In older people statistics are not robust. Evans *et al*.[3] report rates of 10.4% for persons between the ages of 64 and 75 years, and up to 15% in subjects older than 45 years. The disease is more prevalent in females.

In reviewing the status of asthma in this population, it appears that some cases are relapses of childhood asthma. New-onset asthma after the age of 65 has an annual reported incidence of 60-100 cases per 100 000 which is no different to the incidence reported in young and middle-aged adults. The prevalence of asthma in the aged has great significance from the public health perspective.

Remission of asthma and disappearance of symptoms to an asymptomatic latent phase is rare in middle-aged and elderly asthmatics.[4]

PATHOLOGY

The GINA[5] guidelines suggest that 'late-onset' asthma is not associated with evidence for specific allergen sensitivity. Atopy has traditionally been considered to be uncommon in elderly asthmatic patients and infrequently considered in their management.

Correspondence: Dr M Plit, PO Box 663, Parklands 2121. Tel 011-482-6023, fax 011-482-3132, email mplit@worldonline.co.za.

A recent study in New York city[6] suggests otherwise. A study in the inner city demonstrated that 605 elderly patients were sensitised to at least one allergen and 47% displayed elevated serum specific IgE levels to cockroach, the most common indoor sensitivity. These subjects had greater reduction in airflow compared with those non-sensitised to cockroach, and poorer response to bronchodilator therapy.

Elderly urban asthmatic patients displayed a pattern of allergy sensitisation similar to that reported in children and young adults in urban areas in the USA and associated with increased asthma morbidity. This suggested that many cases of asthma in the elderly may not be primarily intrinsic in origin.

Inflammation and immunological markers in the airways and peripheral blood of older non-smoking asthmatics are identical to those in younger asthmatics.

MORBIDITY AND MORTALITY

Mortality from asthma in old age appears to be rising when mortality from other age groups have fallen or levelled out.

Asthma-attributed death rates in adults over 65 years of age are six times higher than those of adults less than 40 years of age.[3]

The factors associated with increased mortality are:

- Accelerated decline in FEV_1 , in non-atopic asthmatic patients
- Poor perception of airflow obstruction and patients are less likely to report respiratory symptoms, resulting in delay in diagnosis
- Disease and severity not recognised by doctor with no documentation of lung function
- Sensitisation to cockroach allergen
- Delayed and inadequate therapy
- Reliance on $beta_2$-agonist therapy for control of symptoms.

DIAGNOSIS OF ASTHMA IN THE OLDER PATIENT

Asthma symptoms in older patients may not be as specific as those in younger asthmatic sufferers.

Episodic wheeze and breathlessness may be evident. Troublesome recurrent cough, either dry or productive, and tightness of the chest are not uncommon. Breathlessness on exertion may also be a feature of asthma. A positive response to any of these symptoms should alert one to the possibility of asthma, particularly if the patient is a non-smoker.

Examination alone is less likely to be diagnostic. It is vital to exclude other diseases with similar symptoms including:

Pulmonary causes[7,8]

- Pulmonary emboli
- Pulmonary infection
- Bronchiectasis
- COPD
- Upper airway obstruction
- Malignant disease

- Tuberculosis
- Carcinoid

Cardiac causes

- Ischaemic heart disease
- Valvular heart disease
- Cardiomyopathy
- Atrial fibrillation with or without significant heart failure

Miscellaneous causes

- Reflux oesophagitis with or without aspiration
- Muscle weakness
- Thyroid disease
- Anxiety hyperventilation
- Depression
- Anaemia

Late-onset asthma very occasionally occurs in association with vasculitis and marked eosinophilia (Churg-Strauss syndrome). Long-standing asthma may enter a severe destructive phase with allergic bronchopulmonary aspergillosis (GINA).[4] Aspiration pneumonia may coexist with asthma or mimic asthma.

COPD may be difficult to distinguish from asthma with which it may coexist. This may be resolved with a trial of steroids. Prednisone 40 mg daily for 14 days or inhaled corticosteroid equivalent to 800 µg budesonide (400 µg twice daily) for 6 weeks is administered before and after:

- Measurement of FEV_1
- Detailed history of effort tolerance
- 6-minute walk test.

A return of FEV_1 to normal is indicative of asthma and must be treated as such. If there is partial improvement associated with less dyspnoea and functional improvement of >12% (and at least 200 ml) of baseline FEV_1, or a >10% improvement in the 6-minute walk test, add an inhaled corticosteroid to the therapy on a trial basis. The partial improvement is highly suggestive of a combination of COPD and asthma.

PULMONARY FUNCTION IN THE OLDER PATIENT

Most elderly patients can be assessed by means of pulmonary function; in some this requires patience, persistence and encouragement.

Spirometry and peak flow measurements before and after a bronchodilator confirm the diagnosis, and help assess severity and response to treatment.

In the elderly an FEV_1/FVC ratio below 65% is generally accepted as evidence of obstruction since with increasing age a ratio of 70% can be found in adults over the age of 65 who are free from respiratory symptoms.

Peak flow measurement with home diary and recording can assist in the diagnosis and management.

TRIGGER FACTORS

Acute exacerbations and worsening asthma are similar across all age groups when triggered by allergen exposure, infection and air pollution.

Enquiry into whether patients are taking drugs such as oral and topical beta-blockers (used in glaucoma), aspirin, non-steroidal anti-inflammatory drugs and angiotensin-converting enzyme (ACE) inhibitors is important. These are frequently prescribed in the aged and may precipitate asthma or induce bronchospasm.

THERAPEUTIC REQUIRMENTS

Specific needs in the aged include:

- Understanding of disease by patient and caregiver
- The necessary skills for use of asthmatic appliances
- Written instructions of the management programme
- Awareness of the effects and side-effects of the drugs
- Minimise symptoms and improve quality of life.

EDUCATION

An education programme for patient and caregiver is essential. It should encompass:

- Understanding of the disease
- Explanation of how different therapies work (the difference between preventer, controller and reliever medication)
- The need for regular therapy even in the absence of symptoms
- Instruction as to when and how to increase medication (self-management plans including the use of peak flow meters)
- How to recognise a severe attack and when to seek medical attention
- Regular review of the patient.

THERAPY[9,10]

Use of corticosteroids

The published South African Guidelines[11] for the management of asthma apply in older patients. In persistent asthma inhaled steroids remain first-line therapy. The initial dose of steroid therapy is determined by the severity of the disease.

Side-effects occur frequently which include easy bruising and purpura associated with the increased fragility and loss of elasticity of the ageing skin. At higher doses of inhaled corticosteroid and above 800 µg of beclamethasone or equivalent inhaled drugs, cataract formation, osteoporosis, hypergylcaemia, hypokalaemia, gastrointestinal haemorrhaging, hypertension, fluid retention and depression are possible complications.

Calcium supplements and biphosphates should be routinely given to all patients over the age of 65 years.

Short courses of systemic steroids (prednisone 40-60 mg) should be given for breakthrough episodes. It is given as a single dose in the morning for between 10 and 14 days. The systemic steroid should be stopped abruptly after the course and not reduced in a 'tailed off' manner. Short courses of drugs stopped abruptly do not cause adrenal suppression.

Bronchodilator drugs

Short-acting inhaled $beta_2$-agonists are the most effective bronchodilator drugs. They may be administered with an anticholinergic drug in a single inhaler.

Long-acting $beta_2$-agonists are required for severe cases and used in combination with an inhaled corticosteroid drug. Ageing does not affect the bronchodilator response to a beta-agonist.[12]

Care needs to be taken in patients with ischaemic heart disease, particularly with the development of angina.

A problem exists when patients develop tremor and palpitations even at lower doses of short- or long-acting $beta_2$-agonists. An anticholinergic should be substituted. Patients on an inhaled anticholinergic may complain of a disagreeable taste, throat irritation, dryness of the mouth and prostatism. Glaucoma is not a contraindication to the use of anticholinergic aerosols.

Consideration of a leukotriene tablet as a substitute for a long-acting beta$_2$-agonist may be appropriate. In patients with both asthma and rhinitis leukotrienes may be very effective combination therapy.

Theophyllines contribute little to further bronchodilation in asthma; toxicity may be greatly increased and therefore theophyllines are not recommended in older patients. If administered, measure blood drug level since they have a narrow therapeutic range. They may be useful in controlling nocturnal asthma. Clearance of the drug is prolonged in liver failure, congestive heart failure and with co-administration of drugs such as cimetadine, erythromycin, calcium antagonists, quinolones and allopurinal.

Drug delivery devices

The metered dose inhaler (MDI), the most widely used device, is generally unsatisfactory in the elderly. It requires dexterity, co-ordination and a certain amount of muscle strength. Cognitive impairment significantly impairs its use. Delivery may be improved with spacers but they are often unsatisfactory.

Devices such as rotahalers, turbuhalers, and accuhalers demand less co-ordination. The simplest of all is the breath-activated device which requires very few steps for successful use.

In difficult cases nebulisation may be necessary to supply both reliever medication as well as the inhaled steroid. Care should be taken to reduce misuse and overdose. Monitoring and more frequent follow-up education and supervision are required.

IMPAIRMENT

Many elderly patients have ailments which impair the management of asthma:

- Arthritis – limits use of inhalers
- Visual – not able to read instructions or use the peak flow meter
- Memory loss – written instructions are necessary in clear large print
- Hearing loss – ensure patients have heard the instructions, ask them to repeat the information and check if they can read the written document.

Assistance of a caregiver may be required to help with these frailties.

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