Controlling asthma

Highlights of the 1999 Canadian Asthma Consensus Report

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Asthma represents a serious burden of illness in primary care, and its prevalence continues to increase at an alarming rate. Although both local and international guidelines on asthma management exist, some believe that clinical management of asthma is suboptimal (Laboratory Centre for Disease Control, Health Canada. Physician asthma management survey 1996-97).[1] The medical literature suggests[2,3] that important aspects of guidelines' recommendations are not being adopted by primary care physicians.

In a recent report, Joyce and McIvor[4] indicate that asthma patients in Canada use β_2-agonists and experience symptoms more frequently than is considered acceptable by current asthma care guidelines. In an editorial in this issue, Dr Dean highlights issues relevant to guideline implementation (page 761). This article is intended to provide readers with important highlights of the 1999 Canadian Asthma Consensus Report,[6] which presents a revision of previous guidelines.[6]

Definition

Asthma is an inflammatory disorder of the airways associated with intermittent or persistent symptoms, such as dyspnea, chest tightness, wheezing, sputum production, and cough. Associated features include variable airflow limitation and airway hyperresponsiveness to both endogenous and exogenous stimuli. While the relationship between airway inflammation, airway remodeling, and airway hyperresponsiveness is complex, these factors are believed to contribute to the chronicity of asthma.

Diagnosis

Both historical and objective data should be used to establish a diagnosis. Physical examination results are often normal despite underlying airway obstruction; consequently, lung function testing should use simple spirometry or serial measurements of peak expiratory flow rate (PEFR). Variable airflow obstruction can be documented by demonstrating an increase in forced expiratory volume in 1 second (FEV_1) of more than 12% (preferably 15% and a minimum increase of 180 mL for adults) after bronchodilator challenge. It can also be documented by an increase in FEV_1 of more than 20% (minimum 250 mL for adults) over time or after 10 to 14 days of inhaled or oral glucocorticoid therapy. A change in PEFR (>20%) after bronchodilator challenge or over time can also be used to document variable airflow obstruction.

Methacholine or histamine challenge are sometimes used to assess the degree of airway hyperresponsiveness. Allergy testing can facilitate diagnosis and management.

If children are unable to perform spirometry reliably, diagnosis and management should be based on history and physical findings, keeping in mind that the likelihood of asthma increases in the presence of wheezing before the first year of life; recurrent episodes of wheezing and dyspnea (particularly if not linked to viral illness); recurrent episodes of cough, dyspnea, or wheezing, especially if associated with exercise or sleep disturbance; respiratory symptoms with a seasonal component; improvement with asthma therapy; a personal history of atopy; a family history of atopy or asthma; and regular exposure to second-hand smoke.

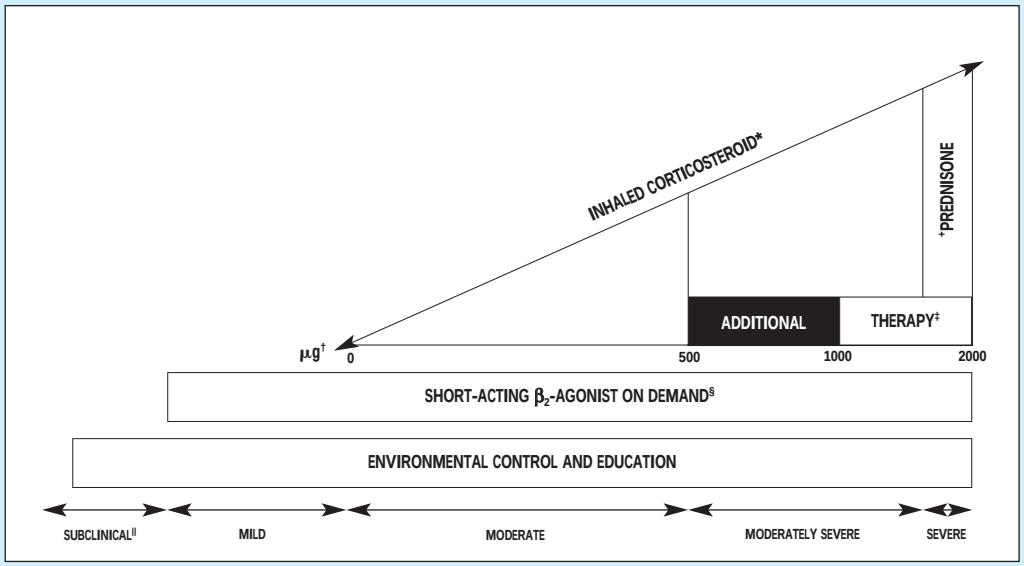
Goals of therapy

Both nonpharmacologic (patient education, including action plans and environmental control strategies) and pharmacologic strategies should be used to achieve and maintain acceptable control with the lowest effective dose of medication. In general, acceptable control is defined as very few daytime or nocturnal symptoms, normal physical activity, mild and infrequent exacerbations, infrequent need for β_2-agonist therapy (<4 doses/wk allowing for one daily dose to prevent exercise-induced symptoms) and a FEV_1 or PEFR above 85% personal best and a PEFR diurnal variability of less than 15%. Inhaled glucocorticosteroids (ICSs) are first-line anti-inflammatory therapy for all ages (**Figure 1**).

Assessment of severity

Factors that help to define severity include the frequency and duration of symptoms, the degree of airflow limitation, and the amount of medication required to maintain acceptable control. Patients with severe or poorly controlled asthma including an FEV_1 or PEFR below 60% of predicted

Figure 1. **Continuum of asthma management:** *Asthma treatment constitutes a continuum where inhaled corticosteroids remain the first-line drug for long-term asthma control.*



* *Inhaled corticosteroid dose required above 400 to 500 mg/d (as beclomethasone equivalent).*

† *β_2-agonist needed more than 3 times weekly (excluding one dose daily before exercise).*

‡ *The role of leukotriene antagonists as monotherapy remains to be determined. If asthma is not adequately controlled by moderate doses of inhaled corticosteroids, additional therapy including long-acting β_2-agonists; leukotriene antagonists; or (less often) theophylline, ipratropium, or nedocromil may be added.*

§ *As rescue medication, β_2-agonists should be used at minimum dose and frequency.*

‖ *Severity of asthma is ideally assessed by medication required to maintain acceptable ashma control. Reprinted with permission from Boulet et al.*[5]

value and recent hospitalization should be followed very closely and referred to a specialty facility. It is important to consider that PEFR can greatly overestimate lung function as compared with FEV_1.[7]

Pharmacotherapy

Short-acting β_2-agonists should be used to relieve symptoms. Anti-inflammatory medications include ICSs, oral glucocorticosteroids, leukotriene-receptor antagonists, cromoglycate, and nedocromil. Other medications that help to control and prevent symptoms from occurring include long-acting β_2-agonists, theophylline, and ipratropium bromide. None of these secondary medications should be used without ICS therapy.

Patients with infrequent symptoms and normal lung function can be managed with short-acting β_2-agonists as needed. If β_2-agonist use exceeds three doses weekly (excluding one dose daily before exercise) and if lung function is reduced (<85% of predicted), ICSs equivalent to a daily dose of 200 to 1000 µg of beclomethasone dipropionate should be instituted. For patients with frequent symptoms and expiratory flows less than 60% of predicted value, initial therapy with oral glucocorticosteroids would be appropriate.

Efficacy of all therapeutic trials should be assessed using both subjective and objective criteria. Acceptable control should be maintained with the lowest dose of medication possible, which could require a minimum of several months of ICS therapy. In young children who require regular moderate doses (>400 µg/d) of ICS, growth parameters should be followed regularly.

If ICS doses of 500 to 1000 µg of beclomethasone dipropionate or its equivalent are insufficient to control asthma, additional therapy in the form of a long-acting β_2-agonist (salmeterol and formoterol) or a leukotriene-receptor antagonist (zafirlukast and montelukast) should be considered. At present, montelukast at a dose of 5 mg daily is indicated for children 6 years of age and older while zafirlukast is not indicated for children younger than 12 years. If patients choose not to use ICSs for any reason, leukotriene-receptor antagonists should be the anti-inflammatory therapy of choice.

Other agents, such as cromoglycate and nedocromil, are used infrequently as alternative therapies for prevention of exercise-induced bronchospasm and to help reduce allergen-induced responses associated with short-term exposures. Theophylline is infrequently used as alternative therapy because the incidence of side effects is higher than with other agents. Ipratropium bromide could have a role for patients intolerant of short-acting β_2-agonists and those suffering from chronic obstructive pulmonary disease.

Principles of emergency management of asthma

The following recommendations should be considered in the management plan for patients presenting with acute worsening of asthma and who require urgent care.

- Objective measures of lung function before and after β_2-agonist challenge are desirable but should not postpone therapy.
- Perform arterial oxygen saturation (SaO_2) assessment. Oxygen should be administered to maintain SaO_2 above 94%.
- Inhaled short-acting β_2-agonists should be first-line therapy.
- Metered-dose inhalers with spacers or dry powder inhalers are preferred over wet nebulization for mild to moderate cases; a spacer should be used for severe asthma.
- Patients treated in emergency rooms should be considered for systemic glucocorticosteroid therapy.
- Consider anticholinergic therapy for moderate to severe acute asthma.
- Aminophylline is not usually indicated for use in the first 4 hours of therapy in emergency rooms.
- Decisions regarding discharge should be based on lung function measurements and assessment of risk factors for relapse.
- Patients requiring steroid therapy should be given 30 to 60 mg of prednisone (or equivalent) daily for 7 to 14 days without tapering (1 to 2 mg/kg of prednisone or equivalent for 3 to 5 days in children). Inhaled glucocorticosteroids should be used in conjunction with oral steroid therapy.
- Patients should be given a written discharge plan that includes instructions for follow up with their family physicians.

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Available

Combating undiagnosed mental illness

A panel of Canadian psychiatrists has developed an 11-question self-administered test to help people assess their own risk of depression. Part of a campaign to make Canadians aware of the signs and symptoms of depression and to encourage those who might be affected to seek professional advice, the questionnaire is available on-line at www.feelingblue.com. Dr Stanley Kutcher, a Professor and Head of the Department of Psychiatry at Dalhousie University, outlines the campaign's goals: "If we can get people to recognize their own symptoms as possibly being depression, and if we can get them to believe they're not alone, we can hopefully get them to take the first important step toward recovery—booking a visit to see their doctor." The questionnaire asks the following.

- Have you been feeling sad, depressed, or down most of the time?
- Have you been less interested and less able to enjoy the things that once gave you pleasure?
- Have you felt tired or without energy most of the time?
- Have you had trouble sleeping or do you sleep too much?
- Have you had an increase or decrease in appetite or weight?
- Have you found it difficult to concentrate or make decisions?
- Have you had feelings of worthlessness or guilt?
- Have you felt frightened or panicky for no apparent reason?
- Have you felt restless and found it difficult to sit still?
- Have you been feeling anxious or worried?
- Have you felt as though you just cannot go on, or had thoughts of death or dying?

Superheroes teach about bed-wetting

Children with enuresis and their parents can now get information about the often emotionally devastating condition on-line. The website (www.bedwetting.ferring.ca) is divided into two sections, one for parents and one for children. Guided by the superheros Action Man and Action Woman, children can point and click their way through sex and age divisions to learn more about bed-wetting, find out how many other children share the condition, get instructions on using a special calendar to keep track of their dry nights, and check out other related sites. The message that bed-wetting is *not* their fault is reinforced throughout the site.

The parents' section includes more extensive information on whether children can grow out of bed-wetting, whether character flaws contribute to enuresis, whether children's activities should be curtailed, whether a physician should be consulted, and what treatments are available. A diagnostic questionnaire can speed up the process of assessing the child's condition and can be printed off to take to the next physician's appointment. Parents are reassured throughout that they can usually control and prevent bed-wetting while protecting their children's self-esteem.