Asthma control - Practical suggestions for practicing doctors in family practice

Green RJ, MBBCh, DCH(SA), FCPaed(SA), DTM&H, MMed(Paeds), FCCP, PhD, DipAllerg(SA)
Masekela R, MBBCh, MMed(Paeds), DipAllerg(SA), CertPaedsPulm(SA), FCCP
Moodley T, MBChB, FCPaed(SA), DipAllerg(SA)
Kitchin O, MBBCh, FCPaed(SA), DipAllerg(SA)

Department of Paediatrics and Child Health, University of Pretoria

Correspondence to: Dr Robin Green, e-mail: robin.green@up.ac.za

Abstract

Many surveys of asthma care suggest that only 5% of asthmatics are meeting the 'Goals of asthma management' as set out in the Global Initiative for Asthma (GINA) guidelines. Despite the availability of useful asthma therapies and treatment strategies, the morbidity from asthma has remained significant. This review includes practical suggestions on optimal asthma control for the family practitioner.

Ⓟ **This article has been peer reviewed. Full text available at www.safpj.co.za** **SA Fam Pract 2008;50(2):26-32**

Introduction

You may have noticed that the new buzz word in asthma management is 'control'. What is meant by this term and how can we achieve it in our patients?

What is control of asthma?

Most guidelines for the treatment of asthma highlight effective control of asthma as the most important goal, striving to ensure that the asthmatic is able to lead a normal and physically active life. The GINA[1] guidelines specify six goals for the long-term control of asthma (Table I).

Table I: The GINA guidelines for the long-term control of asthma

• No chronic symptoms
• No limitations on daily activities
• No nocturnal episodes
• No exacerbations
• No need for demand β_2 agonists
• Normal pulmonary function

Or, phrased in another way, for a normal life the aim is to:

- Be completely free of any symptoms i.e. cough, wheeze and breathlessness
- Attend school or work regularly and participate fully in all activities, including sport
- Have a restful sleep free from night-time cough and/or wheeze
- Minimise the number of attacks of asthma
- Avoid hospital admissions

How well have we been doing with asthma control?

Many surveys of asthma care have been published around the world. They suggest that, in total, only 5% of asthmatics are meeting the 'Goals of asthma management' as set out in the Guidelines.[2] Despite the availability of useful asthma therapies and treatment strategies, the morbidity from asthma has remained significant.

In 1997 a project was launched to collect data on the status of asthmatic patients in South Africa. A total of 3 354 individuals indicated that they had asthma. Only 710 respondents met the criteria for analysis, i.e. had asthma, presently on medication. Symptom analysis reveals that most patients still had symptoms of asthma, consisting of a cough and a wheeze.[3] Only 6–8% of South Africans with asthma were found to meet the goals for asthma management.

The recently published National Health and Wellness Study[4] suggests that these older studies of asthma control may not reflect the present control outputs. In this study of 37 000 randomly chosen individuals (all adults), in response to the question 'Have you ever been diagnosed as having asthma by a physician?' 6% of respondents indicated that they had been diagnosed as such, while 80% of those indicated that they currently used a prescription medication for the treatment of asthma (with 72% using a maintenance/controller medication). Forty five per cent of the treated asthmatics indicated that their symptoms were either totally or well controlled. This is good news if it reflects a change in asthma control. We may be doing better!

Is asthma control achievable?

The Gaining Optimal Asthma Control (GOAL) Study was a one-year randomised and placebo-controlled study that compared the efficacy and safety of salmeterol/fluticasone propionate with fluticasone propionate alone to achieve 'total asthma control'.[5] In addition, a second definition of 'well-controlled asthma' was also used. The Study is widely quoted as the definitive answer to 'combination therapy'.

This was the first study in asthma care to attempt to measure the efficacy of a drug against rigid end-points, as used in the guidelines. 'Total asthma control' meant recording seven of eight weeks of no symptoms, normal peak expiratory flow rate, no need for rescue medication use, no exacerbations or emergency room visits, and no adverse events. 'Well-controlled' meant having a few symptoms and limited need for rescue medication. No exacerbations were tolerated in either group. Patients were randomised to one of three strata, if during run-in they were not well controlled and on a dose of inhaled corticosteroid. Stratum one was no inhaled corticosteroid (presently receiving either salmeterol/fluticasone propionate 50/100 μg twice daily or fluticasone propionate 100 μg twice daily), stratum two was 500 μg or less of beclomethasone dipropionate (presently receiving 50/100 μg or 100 μg of active drug respectively) and stratum three was 500–1 000 μg beclomethasone (presently receiving 50/250 μg or 250 μg of active drug respectively). During the study, treatment could be stepped up in any strata, every 12 weeks if control was not total.

A large number of patients entered this study (3 421 qualifying for inclusion). Significantly more patients in each stratum achieved control (total and well-controlled) with salmeterol/fluticasone than did those with fluticasone. At one year 'total control' was achieved across all strata in 31% versus 19% for steroid alone. Asthma became well controlled in 71% versus 59% at study end. Control was achieved more rapidly and at a lower corticosteroid dose with Seretide® than with Flixotide®.

Additional analysis of the GOAL data has demonstrated that patient-centered quality of life is also improved by better asthma control.[6] Total control is the aim. There are a number of important conclusions that can be drawn from this study. Firstly, and probably most importantly, the study confirms the belief previously held by asthma experts that asthma can be well and totally controlled and meet the 'Goals of Asthma Management' set out in the guidelines (Table I).[1] This aim will require the use of not only a good asthma drug like Seretide®, but also attendance to addressing the symptoms that patients will have at follow-up. In addition, patient compliance is a very important part of ensuring these results. A follow-up asthma visit can no longer be a short and brief 'script-repeat exercise. Patients should be asked a few basic questions at each visit (Table II), and inhaler technique and compliance should also be checked.

Table II: Routine asthma follow up questions

1. How often have you experienced asthma symptoms during the past week?
2. How often have you been woken at night by asthma symptoms during the past week?
3. How often have asthma symptoms limited your ability to be active during the past week?
4. How many puffs of reliever medicine have you used during the past week?
5. Have you missed any days of school/work because of asthma in the past month?

What limits control?

Some obvious factors identify themselves in many surveys and studies, of which the most important are:

- Poor patient understanding of asthma and use of medication
- Poor doctor communication with patients
- Poor adherence of patients to therapy
- Poor selection and understanding of medication on the part of the doctors
- Guideline focus on severity

Underestimating asthma (doctor and patient)

This is a vicious cycle of beliefs, whereby both doctors and patients overestimate asthma control and undervalue ongoing symptoms. This was first illustrated in the AIRE Study[2] when two-thirds of asthmatics thought they were well controlled, despite only 5% indicating true control. In the NHWS[4] more than 50% of patients thought that they had mild intermittent asthma despite 40% of them indicating shortness of breath in the last week. Doctors clearly tend to overestimate asthma control in their patients. Martin Partridge found that 55% of doctors thought that their patients were well controlled, despite poor control of such patients being revealed in the Asthma Control Questionnaire.[4] The now famous Suissa Study[7] which demonstrated that use of inhaled corticosteroids (ICSs) regularly resulted in falling asthma mortality, upholds the principle that non-adherence significantly increases the risk of death from asthma.

What do the guidelines say about control?

New Guidelines[1,8] have moved away from severity assessment and now focus on control. Some of the reasons for this are:

- Severity grading is not used by doctors in practice
- Disease severity is not fixed and patients often have variable disease severity
- This strategy has resulted in failure to monitor control
- Control is important and drives:
  - exacerbations: significant reduction in asthma exacerbations occurs in well and totally controlled asthmatics
  - Quality of life
  - Health care costs

What measures are important in assessing control?

Asthma control assessment cannot be done in a few minutes during a quick consultation. Unfortunately this is a part of practice that has to take some time. Many levels of control are required including:

- Symptom scores
- Lung function/peak expiratory flow rate (PEFR)
- Inflammometry (exhaled nitric oxide)
- Patient control scores, such as the Asthma Control Test (ACT) score

All of these methods have been discussed in detail in other reviews.[9]

Wherever possible, asthma control should be monitored objectively. Lung function, even simple peak flow measurement, is useful. No patient should have to monitor their peak flow daily, however during times of symptoms or medication change, peak expiratory flow (PEF) is a useful clue to poor control. Every medical consultation should have a peak flow assessment for children over five years old. In addition to peak flow lung function, spirometry is useful. Moderate and severe asthmatics should be issued with peak flow meters to enable them to assess their condition at home. Forced spirometry should be done periodically at follow-up to confirm home peak flow measurements and assess small airways disease.

Inflammation in asthma can be monitored directly and non-invasively with a hand-held nitric oxide sensor, such as the Niox® machine, which measures exhaled nitric oxide (NO). Exhaled NO (FE_{NO}) provides a surrogate measurement of eosinophilic inflammation. FE_{NO} can be used to monitor airway disease marked by eosinophilic inflammation. An elevated FE_{NO} is highly predictive of a diagnosis of asthma. FE_{NO}

can be used to diagnose steroid-responsive airway disease and to monitor the steroid requirements of patients with asthma.

What drugs promote asthma control?

1. The GOAL Study is an important landmark study suggesting that in moderate and severe asthmatics combination ICS and LABA (long-acting β_2 agonists) achieve greater control than high-dose ICS.
2. Another possible solution to this situation is to promote the use of a combination inhaler, containing both ICS and LABA, for both regular maintenance therapy and relief of symptoms. Such a strategy is to provide an anti-inflammatory drug whenever symptom-requiring medication is used. Two immediate questions are raised: what dose of increased ICS is effective in reducing the duration and severity of exacerbations and, secondly, what LABA provides immediate symptom relief. It is now known that simply doubling the dose of ICS will not reduce the exacerbations of asthma, but that a fourfold increase is effective.[10] Formoterol is a LABA with immediate onset of action, within the first minute. With these two answers it seems rational to suggest that in patients already receiving a low maintenance dose of budesonide/formoterol, replacing short-acting β_2-agonist reliever therapy with the as-needed bud/form combination would enable patients to adjust their anti-inflammatory therapy more rapidly when most needed while simultaneously obtaining effective and rapid relief from symptoms.

The STAY Study[10] gives us some insight into the use of a novel 'combination therapy' and also the value of this strategy in children. This was an international double-blind, randomised, parallel-group study of 2 760 patients aged 4–80 years of age. Patients were randomised to one of three treatment groups: bud/form 80/4.5 μg twice a day, plus 80/4.5 μg as needed; a group for which the bud/form relief therapy was replaced by terbutaline 0.4 mg; and a group receiving budesonide 320 μg twice a day, plus terbutaline prn. Children used a once-nocte maintenance dose. Time to first severe exacerbation as well as severe exacerbation rate, symptoms and lung function were measured.

Bud/form maintenance + relief prolonged time to first severe exacerbation ($p < 0.001$), resulting in a 45%–75% lower exacerbation risk compared to the other two fixed-dosing strategies. The combination strategy for maintenance and relief markedly reduced the number of severe exacerbations, the need for oral corticosteroids, and improved symptom control and lung function compared to the fixed-dosing regimens. All treatments were well tolerated. There were no notable differences between groups.

The results are exciting for improving the control of asthma and balancing the needs of doctors (anti-inflammatory therapy) with the needs of their patients (symptom relief). Clearly this is not a compromise in asthma care but a realistic solution to a complex problem. A concern about this approach is that some patients might end up using the combination inhaler frequently, and therefore receive unacceptably high doses of ICS. However, this was not the case as the mean number of additional doses of combination inhaler was only one dose per day, with very few patients using high doses.

3. What about mild asthma? In this regard some attention must be paid to ciclesonide. A drug with a low potential for systemic side effects will lead to a reduction in serious adverse events, such as adrenal suppression, osteoporosis and fractures in the long-term. Since there are costs associated with these problems, the low incidence of local side effects will also lead to cost savings. Furthermore, improved side-effect profiles and simplicity of treatment regimens may improve adherence and, thereby, asthma control. There are now a significant number of pharmacoeconomic studies to document the reduction in direct costs associated with the use of new anti-asthma agents. Costs of acute exacerbations and uncontrolled asthma are reduced with their use. Though the Rand value of new therapies may be higher than that of conventional, especially generic, inhaled corticosteroids, their improved adherence and lower side-effect profile make them cost-effective when all end-points are considered. It is encouraging that cost-effectiveness data is available for newer agents and the reader is encouraged to evaluate this data together with studies of efficacy on any asthma medication. 'Cheap' is not necessarily so and nor is 'expensive'.
4. Montelukast for episodic asthma: Another strategy that is currently emerging for cost-effective asthma management and the promotion of patient adherence is to treat symptoms when they occur, not just with reliever medication, but with true anti-inflammatory therapy. Such a strategy applies to episodic asthma in pre-school children. There is mounting evidence from three studies that treating asthma at the time of a viral-induced asthma exacerbation is useful. However, montelukast is the only drug that may be used in this way. The first study to suggest the value of this approach was the PREVIA Study.[11] This was followed by the PRE-EMPT Study[12] Australia and finally the study of September exacerbations of asthma in Canadian children.[13]

The PREVIA Study[11] was designed to investigate the role of montelukast in the prevention rate of asthma exacerbations in children aged 2–5 years with a history of episodic symptoms. Montelukast was found to reduce the rate of asthma exacerbations by 32% ($p < 0.001$), and the rate of oral corticosteroid courses ($p = 0.024$) compared to placebo. The incidence of adverse experiences was similar to placebo. The PRE-EMPT study attempted to address the use of montelukast in episodes of asthma/wheeze with some success. This strategy of intermittent use is currently under investigation, as it holds promise of a specific therapy for a scenario where continuous therapy is both difficult and often ineffective.

Other suggested strategies, which are at least as important as drug selection, are;

- Patient education
- Checking patient metered dose inhaler (MDI) technique at every visit
- Treatment of allergic rhinitis in asthmatics
- Stopping smoking (both active and passive)

New evidence emerging from the GOAL Study is the interesting fact that many of the patients who did not meet the objectives for asthma control were smokers (S Pedersen, personal communication).

Lastly, in getting to better asthma control, the difference in background between doctor and patient should always be considered. This is not limited to language differences, but also includes ethnicity, the generation gap and the difference in the levels of education between doctor and patient. Doctors must know that they need to understand and respect patient views on the illness. In a small district hospital servicing a mining and farming community in the North-West

Province, a common reason given by patients for their refusal to use asthma pumps was that "it kills one and removes one's spirit".[14] This is further acknowledgement that it is belief rather than knowledge that determines the probability of the patient using the prescribed medication. The doctor thus has a duty to bridge the gap between himself or herself and the patient in order to achieve a common view. Such a crossing of the cultural divide is as important as educating the patient that being symptom free does not equate with being cured, but rather that they have achieved good control and that they need to continue using therapy to maintain an improved quality of life.

So how can asthma control be achieved in a busy practice?

The following recommendations may be of some use:

1. Spend some time with asthmatic patients – a Medical Aid Code is desirable for patient education
2. Allow asthmatics more frequent visits
3. Utilise the multiple tools suggested above
4. Understand asthma
5. Familiarise yourself with a limited number of drugs
6. Utilise free services, such as those provided by pharmaceutical companies to test asthmatics' lung function and teach patients
7. Use your practice staff to train patients in the use of the MDI technique
8. Utilise disease management programmes
9. Utilise expert opinion (National Asthma Education Programme [NAEP], Internet)
10. Have and provide typed patient instructions

Conclusion

Asthma should be seen from the patient's point of view. Patients want a reduction in exacerbations and symptoms from their therapy. Aim high!

References

1. Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention. Workshop Report. 2006. www.ginasthma.com (last accessed 29 Feb. 2008)
2. Rabe KF, Vermiere PA, Soriono JB, Maier WX. Clinical management of asthma in 1999: The Asthma Insights and Reality in Europe (AIRE) Study. Eur Respir J 2001;16(5):802–7.
3. Green RJ, Rens H. The hidden cost of asthma. S Afr Respir J 2004;10:8–12.
4. Partridge MR. Asthma: 1987–2007. What have we achieved and what are the persisting challenges? Prim Care Respir J 2007;16:145–148.
5. Bateman ED, Boushey HA, Bousquet J, et al. Can guideline-defined asthma control be achieved? The Gaining Optimal Asthma Control Study. Am J Respir Crit Care Med 2004;170:836–44.
6. Bateman ED, Bousquet J, Keech ML, Busse WW, Clark TJH, Pedersen SE. The correlation between asthma control and health status: The GOAL Study. Eur Respir J 2007;29:56–63.
7. Suissa S, Ernst P, Benayoun S, Baltzan M, Cai B. Low-dose inhaled corticosteroids and the prevention of death from asthma. N Engl J Med. 2000 Aug 3;343(5):332–6.
8. Lalloo U, Ainslie G, Wong M, et al. Guidelines for the management of chronic asthma in adolescents and adults. SA Fam Pract 2007;49:19–31.
9. Asthma diagnosis, monitoring and control. Professional Nursing Today 2007;11:30–33.
10. O'Byrne PM, Bisgaard H, Godard PP, et al. Budesonide/formoterol combination therapy as both maintenance and reliever medication in asthma. Am J Respir Crit Care Med 2005;171: 129–36.
11. Bisgaard H, Zielen S, Garcia-Garcia MI, et al. Montelukast reduces asthma exacerbations in 2-5 year old children with intermittent asthma. *Am J Respir Crit Care Med* 2005;171:315-322
12. Robertson CF, Price D, Henry R, et al. Short-course Montelukast for intermittent asthma in children: A randomized controlled trial. Am J Respir Crit Care Med 2007;175:323–329.
13. Johnston NW, Mandhane PJ, Dal J, *et al*. Attenuation of the September epidemic of asthma exacerbations in children: A randomised, controlled trial of montelukast added to usual therapy. Pediatrics 2007;120:702-712
14. Van Deventer C. Asthma: An approach to some barriers to practice in primary and rural care. Current Allergy and Clinical Immunology 2007;20:57-61.