

Outcomes in pediatric asthma: What are the important issues?

Allan B. Becker, MD Winnipeg, Manitoba, Canada

Historic characteristics related to children and their parents remain the primary focus for diagnosis of asthma in the preschool-aged child. Important questions remain unanswered. Physicians must be better able to assess whether asthma is present. They also need to better understand the genetics of asthma and allergy and to have access to simple, quantitative measurements of those environmental exposures that enhance the risk of allergy and asthma. Physicians must also balance benefits and risks from any intervention, which is difficult because existing guidelines do not offer much information on the preschool-aged child. Although we are unable to prevent the development of asthma and allergy, it is possible to help children and their families control asthma. (*J Allergy Clin Immunol* 2001;107:S485-6.)

Key words: Asthma, airflow, treatment, benefit and risk, efficacy and safety

What are the important issues in pediatric asthma? This simple question is not quite as straightforward as it may appear at first glance; in fact, there are a number of ways to approach an answer. First, we need to consider from whose viewpoint the question is asked. Is this a question from a colleague in clinical practice, or is it posed by a research colleague who is considering a specific research question? Even more importantly, has this question come from a patient or patient's family?

The issues will differ depending on who poses the questions (Tables I and II). For patients and their families, we must often deal first with whether the problem really is asthma. In fact, we often need to deal with that issue ourselves. For the preschool child, the answer is not always simple; but until we are able to answer that basic question, all other issues may be irrelevant.

As clinicians, we frequently base the diagnosis of asthma on the history. Asthma remains a disease process with a definition that is predominately descriptive, and the disorder is not simple to define at any age.¹ Definitions of asthma usually begin with, "Asthma is a disease characterized by..." and proceed to describe clinical features, physiologic abnormalities, and more recently, pathologic changes in the airways. The recent Canadian Asthma Consensus Report is fairly typical²: It defines asthma as "a disorder of the airways characterized by paroxysmal or recurrent

TABLE I. What are the important issues to the patient and family?

Is this asthma?
What is the best treatment?
Will it be outgrown?

TABLE II. What are the important issues to the physician?

Is this asthma?
How do we assess it?
What is the best treatment?
Will it be outgrown?
Can we help?
Can we cure it?
How can we identify patients who are "at risk"?
Can we prevent it?

symptoms (cough, wheeze, chest tightness, and dyspnea) with variable airflow limitation and airway hyperresponsiveness to a variety of stimuli." The report goes on to state that airway inflammation (including mast cells and eosinophils) or its consequences are important in asthma's pathogenesis and persistence. We are, however, unable to measure airflow limitation, airway hyperresponsiveness, or airway inflammation in the preschool child. The objective pulmonary function testing often used to help confirm the diagnosis in older patients is not easily available for a child of this age. Measurement of airway inflammation for clinical purposes is not readily available for patients at any age. As yet, there is no specific, sensitive, readily available biomarker for the diagnosis of asthma.

Thus, historic characteristics related to children and their parents remain the primary focus for the diagnosis of asthma in the preschool child. We need to better understand these historic factors that increase both the positive and negative predictive value for the diagnosis of asthma. Those features that predict persistent asthma as compared with transient disease must also be elucidated better. From an objective viewpoint, it would be helpful to have an efficient, effective, noninvasive method of testing the airway's anatomy and defining physiologic and biochemical changes in the airways that are characteristic of asthma. Simply put, physicians must be better able to assess whether asthma is present. Our patients and their families deserve no less.

It is generally considered that asthma is a heritable disorder influenced by multiple environmental factors. These heritable factors associated with an increased risk for the development of persistent asthma are not well defined as of yet, but the relative risk for the development of asthma and allergy increases if asthma or allergy is present in a first-degree relative.³⁻⁵ A better understand-

From the Section of Allergy and Clinical Immunology, Department of Pediatrics and Child Health, University of Manitoba.

Dr. Becker has no significant financial relationship or interest in Merck & Co. He has prepared this report to present factual, unbiased information and attests that no commercial association has influenced this report, nor does this publication constitute a commercial or personal conflict of interest.

Reprint requests: Allan B. Becker, MD, AE101-840 Sherbrook St, Winnipeg, Manitoba, Canada R3A 1S1.

Copyright © 2001 by Mosby, Inc.

0091-6749/2001 \$35.00 + 0 1/0/114951

doi:10.1067/mai.2001.114951

ing of the genetics of asthma and allergy will help us to better diagnose patients and to identify the infants "at risk" for the development of asthma.

We need to better understand and have access to simple, quantitative measurements of those environmental exposures that enhance the risk of allergy and asthma. Recent data relating to environmental exposure to allergens and other environmental factors (such as tobacco smoke) have helped to identify that risk for the subsequent development of asthma.⁶⁻⁹ Whether modification of these exposures will prevent the development of asthma in childhood, however, requires further research.^{10,11} If we are to improve our ability to diagnose the presence of asthma and to improve the effectiveness of environmental therapy, we must better identify those factors in the home and the community.

Once the diagnosis is accepted, one of the first concerns raised by parents is "Will my child outgrow asthma?" Clinicians must consider a number of issues related to the child's personal and family medical history that may provide an indication of whether this child is likely to have asthma that persists or whether the problem may be transient. Whatever the answer, the family needs to know that the asthma can be controlled. A better understanding of the disease will allow us to treat it more effectively.

Parents want to know, "What is the best treatment for my child, and is it safe?" Physicians must balance benefits and risks from any intervention. Although many guidelines for the assessment and treatment of asthma exist, none of the guidelines offer much information on the preschool child.^{2,12-15} A recent revision of the Global Initiatives for Asthma guidelines does address the issue of asthma in infants and young children (5 years of age and younger).¹⁶ The efficacy and safety of any intervention are important to the children, their families, and their physicians.

Although we are not able to prevent the development of asthma and allergy today, we can help children and their families control asthma. Unfortunately, there are few studies of asthma therapy for the preschool child. Better data on the efficacy and safety of various interventions are essential if we are to develop any consensus for asthma management in the preschool child on the basis of more substantive evidence.

All of the aforementioned issues are important to patients and their families (Table I). Physicians also grapple with these issues and try to define better answers to these questions and others (Table II): What can we do to help our patient "outgrow" asthma? Can we cure asthma? Can we prevent asthma from ever developing, particular-

ly in high-risk families? The answers to these issues are critical if we are to control this growing epidemic.

For now, physicians can offer young patients and their families an assessment based primarily on medical history and intervention directed toward environmental and pharmacologic control. The efficacy and safety of any intervention are important to the children and their families and to their physicians. Although we are unable to prevent the development of asthma and allergy, we can help children and their families control asthma. We need to continue to focus on diagnosis, assessment, and treatment; and we must consider issues of prevention and cure of this increasingly common disease.

REFERENCES

1. Gross NJ. What is this thing called love?—or, defining asthma [editorial]. *Am Rev Respir Dis* 1980;121:203-4.
2. Boulet LP, Becker BA, Bérubé D, Beveridge R, Ernst P. Canadian asthma consensus report. *CMAJ* 1999;161(suppl):S1-S62.
3. Cooke RA, Vanderveer A. Human sensitization. *J Immunol* 1916;1:201-305.
4. Cookson WO, Young RP, Sandford AJ, Moffatt MF, Shirakawa T, Sharp PA, et al. Maternal inheritance of atopic IgE responsiveness on chromosome 11q. *Lancet* 1992;340:381-4.
5. Dold S, Wjst M, von Mutius E, Reitmeir P, Stiepel E. Genetic risk for asthma, allergic rhinitis, and atopic dermatitis. *Arch Dis Child* 1992;67:1018-22.
6. Sporik R, Holgate ST, Platts-Mills TAE, Coswell JJ. Exposure to house-dust mite allergen (Der p 1) and the development of asthma in childhood. *N Engl J Med* 1992;323:502-7.
7. Martinez FD, Cline M, Burrows B. Increased incidence of asthma in children of smoking mothers. *Pediatrics* 1992;89:21-6.
8. Gortmaker SL, Walker DK, Jacobs FH, Ruch-Ross H. Parental smoking and the risk of childhood asthma. *Am J Public Health* 1982;72:574-9.
9. Murray AB, Morrison BJ. The effect of cigarette smoke from the mother on bronchial responsiveness and severity of symptoms in children with asthma. *J Allergy Clin Immunol* 1986;77:575-81.
10. Arshad SH, Matthews S, Grant C, Hide DW. Effect of allergen avoidance on development of allergic disorders in infancy. *Lancet* 1992;339:1493-7.
11. Chan-Yeung M, Manfreda J, Dimich-Ward H, Ferguson A, Watson W, Becker A. A randomized controlled study on the effectiveness of a multifaceted intervention program in the primary prevention of asthma in high risk infants. *Arch Pediatr Adolesc Med* 2000;154:657-63.
12. Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention. NHLBI/WHO Workshop Report 1995. Bethesda (MD): National Institutes of Health, National Heart, Lung, and Blood Institute; January 1995. NIH Publ No 95-3659. (See also <http://www.ginasthma.com/xwork.html>.)
13. National Asthma Association Program. Guidelines for the diagnosis and management of asthma. NAEPP Expert Panel Report 2. Bethesda (MD): National Institutes of Health, National Heart, Lung, and Blood Institute; 1997. NIH Publ No 97-4051.
14. The British guidelines on asthma management: 1995 review and position statement. *Thorax* 1997;52(suppl):S1-S21.
15. Warner JO, Naspitz CK. Third international pediatric consensus statement on the management of childhood asthma: International Pediatric Asthma Consensus Group. *Pediatr Pulmonol* 1998;25:1-17.
16. Global Initiative for Asthma: Pocket guide for asthma management and prevention. Bethesda (MD): National Institutes of Health, National Heart, Lung, and Blood Institute; 1998. NIH Publ No 96-3659B.