MANAGEMENT OF ASTHMA IN THE UNITED STATES: WHERE DO WE STAND?

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William J. Calhoun, MD

ABSTRACT

One of the most common respiratory diseases, asthma has been extensively studied. With increases in knowledge about the pathophysiology of asthma, therapeutic options for this disease have advanced significantly over the past decade, and effective control of asthma is an achievable goal for most patients. Recent data suggest that, despite the advances in knowledge about asthma and the availability of effective therapy, many patients continue to suffer with poorly controlled asthma that impairs their functional ability and quality of life. Furthermore, asthma exacerbations continue to exact a large financial toll on society and the health care system. This paper examines these data regarding the state of care of asthma in the United States. By understanding the areas of deficiency in asthma care, health care providers may be better equipped to improve it.

(Advanced Studies in Medicine 2002; 2(1):8-13)

New data from the Centers for Disease Control and Prevention indicate that 7.2% of the US adult population reported having asthma in 2000, and the overall lifetime prevalence of asthma was 10.5%. The prevalence of asthma in the United States and the rest of the world is increasing for reasons that have not yet been definitively established. Noting that new cases of asthma are now diagnosed at a rate of at least half a million per year, Weiss characterizes asthma as an epidemic.

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE (NHLBI) GUIDELINES AS THE BEST-PRACTICE STANDARD

In an effort to ensure that health care providers are applying new knowledge about asthma in their practices and making best use of asthma therapy, the NHLBI in 1991 established guidelines for the diagnosis and management of asthma. These guidelines were updated in 1997 to accommodate new information about asthma pathophysiology and means of optimizing asthma therapy. The NHLBI guidelines center on 4 components of effective asthma management:

- Use of objective lung function measures to gauge asthma severity and the effectiveness of therapy;
- Environmental control measures to avoid or eliminate triggers of asthma symptoms or exacerbations;
- Comprehensive, long-term pharmacologic therapy directed at reducing inflammation and preventing asthma exacerbations; and

Correspondence to William J. Calhoun, MD, Director, Asthma, Allergy, and Airway Research Center, University of Pittsburgh, 440 Scaife Hall, Pittsburgh, PA 15261.
• Patient education that encourages the patient to partner with the health care provider in controlling the patient's asthma.

Besides defining the 4 broad components of effective asthma management, the NHLBI guidelines established specific goals for asthma care (Table 1) and outlined means of achieving these goals. The following sections of the paper examine the state of care of asthma in the United States with reference to the NHLBI components of and goals for asthma care.

Are Health Care Providers Practicing the NHLBI Components of Asthma Care?

A study reported in the August 2001 issue of Pediatrics assessed the performance of health care providers with respect to the 4 NHLBI components of asthma management by interviewing parents of 260 children with asthma who participate in either of 2 large managed care organizations. The results suggest that asthma care for children was more likely to be consistent with the NHLBI components when a specialist rather than a generalist was the patient's primary source of care for asthma. Patients who were treated by specialists compared with generalists were:

• 6.7 times more likely to have been prescribed controller medications;
• 6.5 times more likely to have ever had a pulmonary function test; and
• 5.9 times more likely to have been told about asthma triggers and how to avoid them.

These data suggest the need to intensify efforts to inform and educate generalists about the NHLBI guidelines and about the importance of referring a patient to an asthma specialist such as an allergist or immunologist when appropriate. This consideration for referral to an asthma specialist may occur when the goals of asthma therapy are not being met (e.g., in the presence of recurrent exacerbations), when a life-threatening asthma attack has occurred, or when other conditions such as sinusitis or chronic obstructive pulmonary disease complicate asthma.

Although specialists were more likely than generalists to follow the NHLBI recommendations regarding 4 components of effective asthma management in this study, even specialists did not uniformly adhere to these guidelines for best practice. For example, according to parent reports, 14% of specialists failed to perform pulmonary function tests to monitor asthma and the effects of therapy; 31% of specialists failed to provide written instructions for managing asthma; and 11% of specialists failed to provide instructions on proper use of an inhaler.

The pediatric study assessed health care providers' performance from the perspective of parents of children with asthma. To obtain a more comprehensive assessment of the state of asthma care in the United States, another study—the 1998 Asthma in America survey—interviewed nationally representative samples of health care providers (512 physicians, 101 nurses, 113 pharmacists) as well as current asthma patients (n = 2509 including 721 parents of children with asthma). Furthermore, the Asthma in America survey included a comparison group of nonasthmatic individuals from the general adult population (n = 1000).

Results of the Asthma in America survey show that patients and health care providers differ in their perceptions about the degree to which the NHLBI components of asthma care are being implemented. For example, 70% of health care providers indicated that they developed a written action plan for asthma management with their patients and that they regularly performed pulmonary function tests (Figure 1). In contrast, only 35% of patients indicated that their

<table>
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<tr>
<th>Table 1. Goals of Asthma Care</th>
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<tr>
<td>• Prevent chronic and troublesome symptoms (e.g., coughing or breathlessness in the night, in the early morning, or after exertion)</td>
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<tr>
<td>• Maintain (near) normal pulmonary function</td>
</tr>
<tr>
<td>• Maintain normal activity levels (including exercise and other physical activity)</td>
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<tr>
<td>• Prevent recurrent exacerbations of asthma and minimize the need for emergency department visits or hospitalizations</td>
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<tr>
<td>• Provide optimal pharmacotherapy with minimal or no adverse effects</td>
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<tr>
<td>• Meet patients' and families' expectations of and satisfaction with asthma care</td>
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</table>

Data from reference 5.
health care providers performed pulmonary function tests, and 27% of patients indicated that their health care provider worked with them to develop a written action plan. Thus, although health care providers report that they are practicing asthma care consistent with that recommended in the NHLBI guidelines,5 many patients report that they are receiving a lower standard of care.

Are the NHLBI Goals of Asthma Therapy Being Met?

The Asthma in America survey included several items assessing whether or not the specific goals of asthma therapy set forth by the NHLBI (as distinguished from the broad components of care described above) are being met. Like the components-of-care data described above, results of the Asthma in America survey suggest that asthma care is suboptimal for many patients.

Maintenance of Near-Normal Lung Function and Prevention of Symptoms

NHLBI goals of asthma care include the maintenance of near-normal lung function and the prevention of symptoms. The fact that 38% of patients in the Asthma in America survey met National Institutes of Health criteria for moderate persistent asthma (19%) or severe persistent asthma (19%) suggests that these goals are not being met (Figure 2). The symptom criteria for moderate persistent asthma are: (1) daily symptoms; (2) daily use of a short-acting bronchodilator; (3) exacerbations that affect activity; and (4) exacerbations that occur at least twice weekly. The symptom criteria for severe persistent asthma are: (1) continual symptoms; (2) limited physical activity; and (3) frequent exacerbations.

Optimal Pharmacotherapy

Although the National Institutes of Health recommends dual-controller therapy comprised of an inhaled corticosteroid and a bronchodilator as the most effective therapy for patients with moderate persistent or severe persistent asthma,6 fewer than half of patients with these types of asthma used dual-controller therapy in 1999 or 2000.8 Thus, another of the NHLBI goals—that of providing optimal pharmacotherapy with minimal or no adverse events—is not being met.
MAINTENANCE OF NORMAL ACTIVITY

The NHLBI guidelines established maintenance of normal activity levels as another goal of asthma care. The Asthma in America data show that many patients are prevented from performing normal activities because of their asthma. Asthma caused 25% of adults to miss work and 49% of children to miss school during the year prior to the survey. In addition to work or school, recreational activities and home life were also disrupted by asthma:

- 48% of asthma sufferers reported limitation in sports or recreational activities;
- 31% reported limitation in ability to perform household chores;
- 31% reported that their overall lifestyle was disrupted because of asthma; and
- 25% reported limitation of social activities.

Besides impacting patients’ functional abilities, asthma also affected patients’ self-perceptions. Approximately half of patients (45%) felt that because of asthma they did not function at their full potential; 47% of adults and 34% of children reported that their expectations of their physical abilities were reduced because of asthma. A sobering 1 in 4 adults (24%) indicated that asthma had influenced their choice of job and career.

EXACERBATIONS OF ASTHMA

A primary goal of asthma therapy is to prevent recurrent exacerbations of asthma and minimize the need for emergency department visits and hospitalizations. The data from the Asthma in America survey, which shows a relatively high rate of emergency department and urgent-care visits because of asthma, suggest that this goal is not being met. During the year prior to the survey, approximately

- 1 in 10 patients with asthma were hospitalized because of asthma;
- 1 in 4 patients visited a hospital emergency department because of asthma;
- 1 in 5 patients required an urgent-care visit because of asthma; and
- 1 in 3 patients had an unscheduled emergency visit to a health care provider because of asthma (Figure 3).

Health care use was consistently higher among children with asthma compared with adults for each of these categories of care.

MEETING PATIENTS’ EXPECTATIONS

Ironically, although the data suggest that none of the NHLBI goals for control of symptoms and maintenance of normal daily function are being adequately met for many patients, patients themselves are generally not dissatisfied with the care they receive. Nine of 10 patients in the Asthma in America study indicated that they were satisfied with their doctors’ knowledge of asthma and asthma management, their doctors’ ability to explain asthma management, and their doctors’ willingness to spend time with them. Sixty-two percent (62%) of patients...
indicated that their doctors’ advice helped “a lot” in managing their asthma symptoms. The NHLBI goal of meeting patients’ expectations of asthma care and ensuring patient satisfaction is thus being met for many patients.

However, other data from the Asthma in America survey suggest that, satisfaction with their asthma care notwithstanding, patients are poor judges of the severity of their asthma and degree of control over it. Of patients with moderate persistent asthma (ie, meeting symptom criteria of daily symptoms, daily use of a short-acting bronchodilator, exacerbations that affect activity, and exacerbations that occur at least twice weekly), 60% considered their asthma to be well controlled or completely controlled. Of patients with severe persistent asthma (ie, meeting symptom criteria of continual symptoms, limited physical activity, and frequent exacerbations), 32% considered their asthma to be well controlled or completely controlled. Moreover, 37% of patients with severe persistent asthma and 57% of patients with moderate persistent asthma considered themselves to have mild or no symptoms (Table 2). Besides reflecting a high frequency of poor lung function and symptom control among many patients with asthma, these data show that patients underestimate the severity of their disease and overestimate their control over their asthma.

**Implications**

The data reviewed herein demonstrate that asthma care is falling short of the goals established by the NHLBI. Poor control of symptoms and lung function significantly impairs functional ability and quality of life in a substantial proportion of patients with asthma, and approximately half of those with moderate persistent or severe persistent asthma are not receiving appropriate therapy. As a result, asthma exacerbations, which are often managed via emergency- and urgent-care services, exact a large toll in financial and human resources.

Despite these problems, patients do not report dissatisfaction with asthma care. Furthermore, while patients report significant asthma-related disability and are acutely aware of the impact of asthma on their daily functioning, they overestimate the degree of control they have over their symptoms. This result underscores the need for additional patient education about the significance of asthma symptoms, the characteristics of well-controlled asthma, and the high level of functioning possible with currently available therapy.

The findings suggest that increased education of health care providers, too, is necessary. Health care providers relative to patients overestimate the degree to which common asthma care practices are being followed, and many do not prescribe pharmacotherapies appropriate for the severity of symptoms their patients report. Health care providers should examine their behavior to ensure that they are practicing the best asthma-control techniques and are judiciously prescribing pharmacotherapy. Considering the level of asthma control that is made possible with currently available interventions (see Martin, this issue), the NHLBI goals of asthma care are achievable.

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Table 2. Asthma Severity in Survey Respondents: National Institutes of Health (NIH) Severity Index Versus Self-Classification

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<thead>
<tr>
<th>Self-Classification of Symptom Severity</th>
<th>NIH Severity Index</th>
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<tbody>
<tr>
<td>Total (N=2509)</td>
<td>Severe (n=480)</td>
</tr>
<tr>
<td>No symptoms</td>
<td>25.1%</td>
</tr>
<tr>
<td>Mild symptoms</td>
<td>45.2%</td>
</tr>
<tr>
<td>Moderate symptoms</td>
<td>22.9%</td>
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<tr>
<td>Severe symptoms</td>
<td>6.6%</td>
</tr>
<tr>
<td>Not sure</td>
<td>0.2%</td>
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REFERENCES