

Asthma Management for the Otolaryngologist



John H. Krouse, MD, PhD, MBA

KEYWORDS

• Asthma • Cough • Pulmonary function testing • Unified airway

KEY POINTS

- Asthma is an reversible, obstructive, inflammatory disease of the lower airways that is characterized by cough, wheezing, and shortness of breath.
- Patients with asthma may present with cough alone, often occurring at night.
- Patients presenting with nighttime cough should always have asthma considered as part of the differential diagnosis.
- Owing to system-wide inflammatory effects, otolaryngologists should consider the potential presence of asthma in all patients presenting with allergic rhinitis or chronic rhinosinusitis.
- Asthma can be classified on the basis of severity and chronicity of symptoms, and treated to optimize the patient's level of symptom control.

INTRODUCTION

Asthma is a common inflammatory condition of the lower respiratory system.¹ It is found in all age groups, from infants to older adults, and presents a major disease burden that affects approximately 300 million persons worldwide.² Patients with asthma report a cluster of 3 primary symptoms, including cough, wheezing, and shortness of breath (dyspnea). For many patients, their only symptoms may be a dry cough, often occurring at night, and frequently severe enough to wake them from sleep. Because these symptoms overlap with other common conditions, the diagnosis of asthma is sometimes elusive, and patients with asthma often are misclassified, with unsuccessful treatment and no resolution of their symptoms.

Asthma is a type of obstructive lung disease. With obstruction, patients are able to inspire at relatively normal levels, but have difficulty exhaling fully owing to both narrowing of the lower airways and loss of elasticity of the bronchioles. As a result, air becomes trapped in the lungs, which limits the amount of air exchange and can ultimately decrease oxygenation. In asthma, as opposed to chronic obstructive

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School of Medicine, University of Texas Rio Grande Valley, 1201 West, University Drive, Edinburg, Texas 78539, USA

E-mail address: john.krouse@utrgv.edu

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pulmonary disease, the airway obstruction is at least partially reversible, and the use of a bronchodilating agent such as albuterol will improve expiration and relieve symptoms.

It is important for otolaryngologists to recognize that asthma represents only 1 focused aspect of a broader spectrum of inflammatory respiratory symptoms and that many patients seeking care for conditions such as allergic rhinitis and chronic rhinosinusitis also have concurrent asthma. The concept of the “unified airway” has become well-accepted over the past several decades, and has allowed otolaryngologists to better understand and appreciate the comorbidity of upper and lower airway inflammation among patients with common sinonasal complaints.³ Recognition of these inflammatory comorbidities prompted the World Health Organization in 2002 to state: “When considering a diagnosis of rhinitis or asthma, an evaluation of both the upper and lower airways should be made.”⁴

This article focuses on the management of asthma for otolaryngologists. Because otolaryngologists commonly encounter patients with unified airway diseases such as asthma, many of whom may have undiagnosed disease, it is important for these physicians to recognize the symptoms of asthma, understand the basic elements of diagnosis, and appreciate common approaches to the management of symptoms and control of the underlying disease in these patients.

PATHOPHYSIOLOGY OF ASTHMA

The pathophysiology of asthma involves a variety of complex and interactive processes that result in acute and chronic airway inflammation. The majority of patients with asthma have inflammation that is primarily driven by T-helper 2 cells, with activation of cellular and humoral mediators including mast cells, eosinophils and lymphocytes, as well as numerous interleukins (IL-4, IL-5, and IL-13), chemokines, and other cytokines.^{1,5} In many individuals, this process begins in early childhood, resulting in chronic and progressive inflammatory changes in the lower airway. In others, asthma presents in adults, with little prior history of inflammatory or atopic disease in childhood.

Tissue changes occur in patients with asthma, and are generally progressive with time. Much of this inflammation can be subacute, but with exposure to various triggering stimuli can be unmasked, allowing the acute expression of symptoms among affected patients.⁶ A variety of intrinsic and extrinsic factors can be involved in both the pathogenesis and expression of asthma, including underlying atopy, sensitization, and exposure to allergic antigens, exposure to tobacco smoke, infectious exacerbations, and contact with nonspecific irritants. These inflammatory influences provoke characteristic changes in the respiratory tract, including epithelial shedding, goblet cell hyperplasia, hypertrophy of submucosal mucus glands, subepithelial fibrosis with collagen deposition, smooth muscle hypertrophy, and vascular leakage. These changes are expressed through the cardinal symptoms of cough, wheezing, and dyspnea.⁷

The changes in the lungs that occur over time worsen as the disease progresses, and although initially they can be reversed with treatment, they will become irreversible with chronicity. These changes are described broadly as “remodeling,” representing structural changes in the bronchioles that cause decrease function and increased patient symptoms. These pathophysiologic changes can be described in 3 phases: acute inflammatory, chronic inflammatory, and irreversible (remodeling).

Acute inflammatory changes

- Epithelial cell edema
- Muscle constriction

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