

COMMENTARY

Identifying and managing
rhinitis and its subtypes: allergic
and nonallergic components
– a consensus report and
materials from the Respiratory &
Allergic Disease Foundation

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ABSTRACT

Background: Rhinitis is one of the most common chronic disorders presenting to an internal medicine, pediatric, or family practice clinician. It can greatly impact a patient's quality of life and exerts a tremendous societal burden in terms of both its direct and indirect costs. In practice, in treatment guidelines, and in the literature, discussions of rhinitis as an inflammatory (allergic) disease often eclipse discussions of the nonallergic components, which often contribute to, or are responsible for, a patient's disease. Recommendations for specific diagnostic criteria and treatment options for nonallergic rhinitis are often lacking compared with those addressing allergic rhinitis. Previous guidelines primarily focus on allergic rhinitis and do not provide easy-to-use tools to help primary care practitioners differentiate between, and appropriately treat, the different types of rhinitis. Although it is often difficult and time-consuming clinically to differentiate

between the various rhinitis subtypes, this must be done in order to select an appropriate treatment and achieve desirable outcomes.

Objective: We sought to develop a useful diagnostic worksheet and treatment algorithm to help clinicians correctly identify rhinitis subtypes and provide the appropriate therapy.

Methods: An expert multidisciplinary consensus panel, comprising five allergy and immunology specialists and three ear, nose, and throat specialists with expertise in the diagnosis and treatment of rhinitis, was assembled by the Respiratory & Allergic Disease Foundation (RAD) to discuss a practical clinical approach to rhinitis that considers both inflammatory and noninflammatory elements of the disease. During this meeting, the panel discussed current data and treatment recommendations as well as clinical experiences and challenges in treating rhinitis. Materials to

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help simplify the diagnosis and management of rhinitis were developed as tools to aid the healthcare practitioner.

Results: A rhinitis diagnostic worksheet and treatment algorithm were developed by the authors following the meeting, based on transcripts of the consensus panel's discussions. The diagnostic worksheet can be used to quickly categorize patients as having allergic, nonallergic,

or 'mixed' rhinitis using descriptive criteria.

Using the treatment algorithm as a guide, the appropriate treatment can then be selected based on the suspected rhinitis subtype.

Conclusion: The use of these clinical practice tools may improve the management of rhinitis by helping clinicians to identify both the allergic and nonallergic components of a patient's disease and choose an appropriate treatment.

Introduction

Rhinitis, which affects nearly 25% of the worldwide population, is not a single disease¹. As such, it is difficult to succinctly define. Rhinitis is a heterogeneous group of disorders with diverse pathophysiologic mechanisms that are not always inflammatory. Symptomatically, it is characterized by one or more of the following symptoms: rhinorrhea, sneezing, itching, and/or nasal obstruction. These nasal symptoms are often accompanied by other symptoms relating to the eyes, ears, and throat². Symptoms may have overlapping etiologies, such as anatomic obstruction, infection, underlying systemic disease, or allergy. The underlying causes may include both allergic and nonallergic components. Many patients experience entirely noninflammatory nasal disease, which leads to the concept that rhinitis is not always an 'itis.' The heterogeneity of the disease and its varying etiologies can complicate diagnosis³, but it is necessary to identify and distinguish between these etiologies to manage the disease effectively.

If the ideal approach to treating rhinitis is to eliminate or reduce the underlying cause, one must surely determine the subtype of rhinitis and its relevant triggers in each particular patient before formulating a treatment plan. Treatment of rhinitis should be tailored to the patient's constellation of symptoms. In a practical sense, identifying the subtype of rhinitis helps in the selection of a treatment plan that is most likely to relieve the patient's symptoms. The tools presented in this article can help the practitioner accomplish this in a busy clinical setting.

Impact of rhinitis

Rhinitis is one of the most common chronic conditions in both adults and children. Allergic rhinitis is the most common form, affecting approximately 58 million people in the United States annually, including 10–30% of adults and up to 40% of children, and its prevalence is increasing^{2,4}. The disease is sometimes trivialized because it is not life-threatening, but it has a tremendous impact on patients' quality of life, productivity, and healthcare costs.

Allergic rhinitis is associated with impairments in how patients function in daily tasks at home, at work, and in school^{5,6}. In the recent *Allergies in America* survey, 52% of employed patients with nasal allergies reported that their symptoms either had caused them to miss work or had interfered with their performance in the past 12 months⁷. In a study published in 1999, results from The Work Productivity and Activity Impairment Questionnaire showed moderate-to-severe impairment in classroom productivity, work productivity, and the ability to perform daily activities in 93%, 91%, and 96%, respectively, of individuals with allergic rhinitis. The impairment was significant enough to cause 25% of the individuals to be absent from school or work⁸. Rhinitis symptoms also result in learning problems in children, either directly or indirectly, by causing sleep disturbances, fatigue, and irritability⁹. This effect on learning is compounded by the use of sedating antihistamines⁹, primarily over-the-counter first-generation antihistamines. First-generation antihistamines have been shown to cause drowsiness, fatigue, and impaired cognitive function and thus have detrimental effects on school and work performance¹⁰, resulting in decreased productivity, increased occupational injuries, and impaired driving. Thus, second-generation antihistamines are recommended instead.

As reported by Schoenwetter *et al.* in 2004, symptoms related to allergic rhinitis result in a total of 28 million days of reduced function or productivity annually, including a loss of 3.5 million workdays and 2 million school days due to absenteeism¹¹. A health and wellness study of 8267 employees between December 2001 and September 2002 found allergic rhinitis/hay fever responsible for an estimated total cost of \$4.9 million per year, with 55% of employees surveyed reporting symptoms¹². Increased absenteeism and reduced productivity due to allergies cost US employers more than \$250 million in 1998, a sum that translates to \$291.6 million in 2002 dollars¹¹.

Annual average direct costs have been reported to be as high as \$5.9 billion (2002 cost, \$7.3 billion), and work-impairment costs have been projected to be an annualized \$5.4–7.7 billion^{5,11,13}. The effective treatment of rhinitis can greatly improve patients' quality of life and reduce both direct and indirect healthcare costs.

Both allergic and nonallergic rhinitis have also been shown to be important risk factors for asthma¹⁴⁻¹⁶ and bronchial hyperreactivity^{17,18}. Approximately 30% of patients with perennial allergic rhinitis have asthma, while 75% of patients with allergic asthma have rhinitis, and 40% of patients with nonallergic asthma have rhinitis¹⁶. It is important to look for asthma in rhinitis patients and to look for rhinitis in asthmatic patients, because treating their rhinitis may improve their asthma and vice versa^{14,19}. Rhinitis can also be a risk factor for several other comorbid conditions, including sinusitis, conjunctivitis, and possibly otitis media²⁰. In 1996, the impact of rhinitis on concomitant conditions was estimated at \$4 billion annually²¹.

Rhinitis is not always an 'itis'

Although rhinitis is often considered a predominantly inflammatory disease, not all patients with rhinitis have the allergic component of the disease. It has been estimated that allergic rhinitis affects approximately 58 million patients in the United States, 26 million of whom have concomitant nonallergic rhinitis (mixed rhinitis). Isolated nonallergic rhinitis affects an additional 19 million individuals⁴. One study of patients with perennial rhinitis found only 53% had positive skin tests or elevated specific IgE levels¹⁵. Our view of rhinitis, therefore, must include allergic and nonallergic forms (Figure 1)²².

In 2001, Settiane reported that 57% of rhinitis patients have either nonallergic or mixed disease (Figure 2)²³. Examples of nonallergic causes of rhinitis include infectious rhinitis, rhinitis medicamentosa, nonallergic rhinitis with eosinophilia (NARES), atrophic rhinitis, GERD-induced rhinitis, drug-induced rhinitis, and rhinitis caused by hormonal aberrations. Conditions that can present with symptoms similar to those of rhinitis are nasal septal deviation, hypertrophy of the adenoids or turbinates, foreign bodies, nasal tumors or polyps, cerebrospinal fluid rhinorrhea, and systemic inflammatory diseases, such as Wegener's granulomatosis, sarcoidosis, and Sjögren's syndrome. The treatment of these conditions is beyond the scope of this article.

Allergic versus nonallergic rhinitis

Although there is overlap in symptomatology between allergic and nonallergic rhinitis, there are distinguishing features that help separate these subtypes clinically. Idiopathic nonallergic rhinitis, formerly known as 'vasomotor rhinitis,' is a diagnosis of exclusion, made when allergies and other causes of rhinitis are ruled out. Ideally, a definitive diagnosis of nonallergic rhinitis

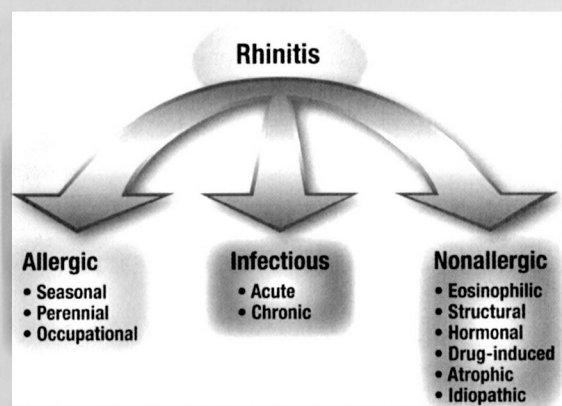


Figure 1. The different types of rhinitis, classified as allergic, nonallergic, or infectious and further divided into subtypes

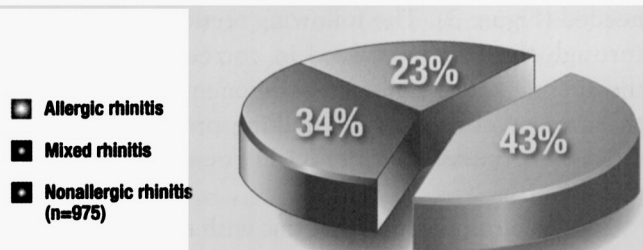


Figure 2. Percentage of patients with allergic, nonallergic, or mixed rhinitis²³

would involve a negative allergy skin test or radio-allergosorbent test (RAST), as recommended by the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines²⁰; however, the RAD consensus panel suggests that a diagnosis based on descriptive criteria can also be utilized in clinical practice.

Features that help identify allergic rhinitis are pruritus, associated ocular symptoms, a family history of atopy, onset during childhood, and seasonal exacerbations⁶. Perennial allergic rhinitis is most often caused by indoor aeroallergens, such as dust mites, pet dander, molds, and cockroaches. Seasonal allergic rhinitis, on the other hand, is caused by outdoor allergens, such as pollens or molds. It is rare that food allergies cause allergic rhinitis, except as part of a multi-organ reaction to a food.

Patients with nonallergic, noninfectious rhinitis (i.e., idiopathic rhinitis) are typically symptomatic year-round, with exacerbations of the symptoms usually seen in the winter months. The onset of symptoms is usually later in life than in allergic rhinitis. These patients often exhibit persistent nasal congestion and/or rhinorrhea and do not typically have pruritus or sneezing as a prominent feature. They often do not respond well to oral antihistamines. Hyperreactivity of the nasal mucosa results in an increase in symptoms upon exposure to nonspecific stimuli, such as strong odors, perfume, sudden changes in temperature, and cigarette smoke, as well as spicy food⁶. As depicted in

Figure 2, about one third of patients with rhinitis have a mixture of allergic and nonallergic rhinitis²³. In these patients, allergens cause mucosal inflammation leading to nasal symptoms, and nonallergic environmental triggers cause exacerbations of the symptoms.

Diagnosis and treatment

The diagnosis and treatment of rhinitis includes taking a careful history, conducting a physical examination, ruling out other causes of a patient's symptoms, developing a treatment plan, evaluating patients to determine the success of therapy, and modifying treatment or referring the patient to a specialist if needed (Figure 3). The following section will navigate through the steps involved in correctly identifying the allergic and nonallergic components of a patient's rhinitis and subsequently making proper treatment choices, as outlined by the RAD Foundation's expert panel.

The diagnosis of rhinitis begins with a careful history and physical examination. Aspects of the history that are important to focus on are the characteristics of the patient's symptoms, their frequency, and their severity. Although allergic and nonallergic rhinitis

can appear similar, some symptoms and features are highly predictive of one condition versus the other. As previously noted, clues in the history that would favor the diagnosis of allergic rhinitis are pruritus, associated ocular symptoms, family history of atopy, and onset during childhood. There are important differences between the constellation of symptoms of seasonal versus perennial allergic rhinitis. In seasonal allergic rhinitis, ocular itching, sneezing, and rhinorrhea tend to be more prominent, whereas in perennial rhinitis, nasal congestion and blockage are more prominent. Because there is major overlap between the symptoms of perennial allergic rhinitis and those of nonallergic rhinitis, it may be difficult to differentiate these two conditions without skin testing. However, historical data that are highly predictive of nonallergic rhinitis are onset of symptoms after age 35, lack of a family history of allergy, and the occurrence of symptoms in the presence of perfumes but in the absence of pets²⁴.

The diagnostic worksheet developed by the RAD Foundation is designed to help the clinician by suggesting allergic versus nonallergic rhinitis or a mixed etiology. While taking a patient's history, the clinician can go through the diagnostic checklist and place a check mark beside those symptoms that apply to the patient to help determine whether he or she exhibits

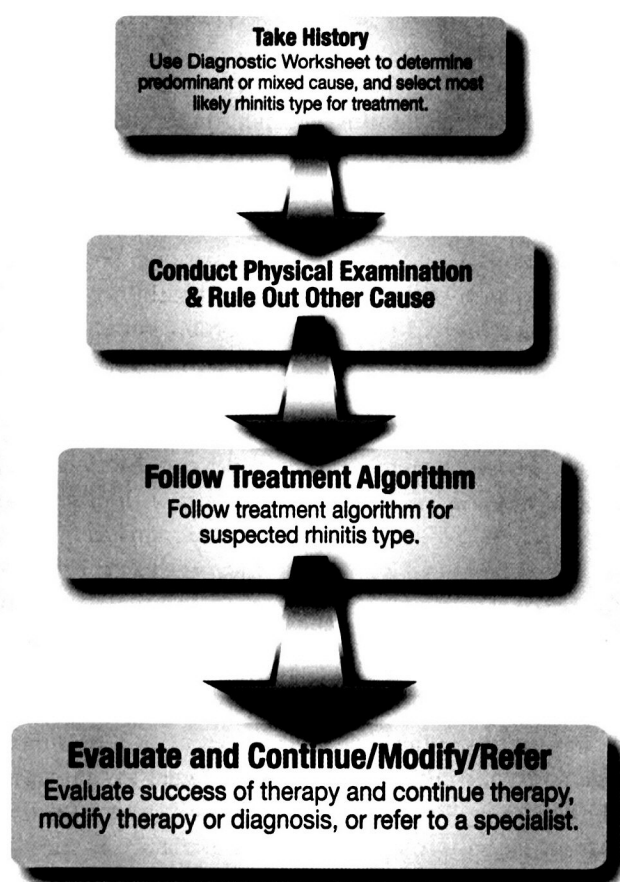


Figure 3. Steps for the effective diagnosis and management of patients with rhinitis

features indicative of allergic rhinitis, nonallergic rhinitis, or both (Figure 4).

While taking a history, determining relevant triggers and irritants in each particular patient is of great importance. Reducing the triggers not only improves the patient's symptoms but also reduces medication requirements²⁰.

On physical examination, facial features of allergic rhinitis include a nasal crease below the bridge of the nose, mouth-breathing, and 'shiners' (dark circles under the eyes). The last two features can also be seen in nonallergic rhinitis if significant nasal congestion is present. Inspection of the nasal mucosa should be part of the physical examination for every patient with a history of rhinitis. In patients with allergic rhinitis, the nasal turbinates often appear pale and edematous, with a clear nasal discharge. Purulent nasal discharge, on the other hand, may indicate infection.

Although the treatment of rhinitis has been previously described^{2,6}, the RAD consensus panel has developed a treatment algorithm that differentiates between approaches to predominantly allergic and nonallergic types (Figure 5). The first step in the treatment of rhinitis is educating the patient about allergen

and irritant avoidance. Although this can be valuable, avoidance alone may not be sufficient in most cases, and medication often must be added. If the history and physical examination point to a predominantly nonallergic rhinitis or mixed rhinitis, therapy can be initiated with a topical antihistamine (azelastine nasal spray) or an intranasal steroid. For additional treatment of nasal congestion, saline irrigation or pseudoephedrine may be added. If watery rhinorrhea is the main symptom, ipratropium bromide may be used. If bacterial infection is likely, antibiotics should be initiated.

If the patient has predominantly persistent allergic rhinitis, the first-line treatment would be an intranasal steroid, particularly when nasal congestion is a prominent symptom. A nonsedating oral antihistamine may be used to relieve pruritus, sneezing, and ocular symptoms. However, oral antihistamines are not very effective in treating nasal congestion. Oral decongestants (e.g., pseudoephedrine and phenylephrine) can effectively reduce nasal congestion produced by allergic and nonallergic forms of rhinitis and are available in combination with oral antihistamines. However, they have significant side effects of insomnia, jitteriness, loss

Rhinitis

Diagnostic Worksheet

Nonallergic • Mixed • Allergic

Suggests Nonallergic Rhinitis	Suggests Allergic Rhinitis
☐ Persistent congestion and/or rhinorrhea without Itch/sneeze	☐ Sneezing
☐ Poor response to oral antihistamines	☐ Itchy nose (the "nasal salute")
☐ Symptoms exacerbated by:	☐ Seasonal symptoms
☐ Weather changes	☐ Itchy eyes/eye rubbing
☐ Temperature extremes/changes	☐ Clear rhinorrhea
☐ Foods	☐ Family Hx of allergic rhinitis
☐ Perfumes/odors	☐ Eczema
☐ Smoke/fumes	☐ Food allergy
☐ Late age of onset	
☐ Absence of cat/dog/pet trigger	

} Frequent co-morbidities in pediatric patients

Ear popping, frequent upper respiratory tract infection, fatigue, headache, and sleep disturbance are among the features normally associated with both allergic and nonallergic rhinitis and, therefore, not helpful in determining the type of rhinitis.

Figure 4. Checklist of symptoms to help the clinician determine whether a patient exhibits features of allergic rhinitis, nonallergic rhinitis, or both

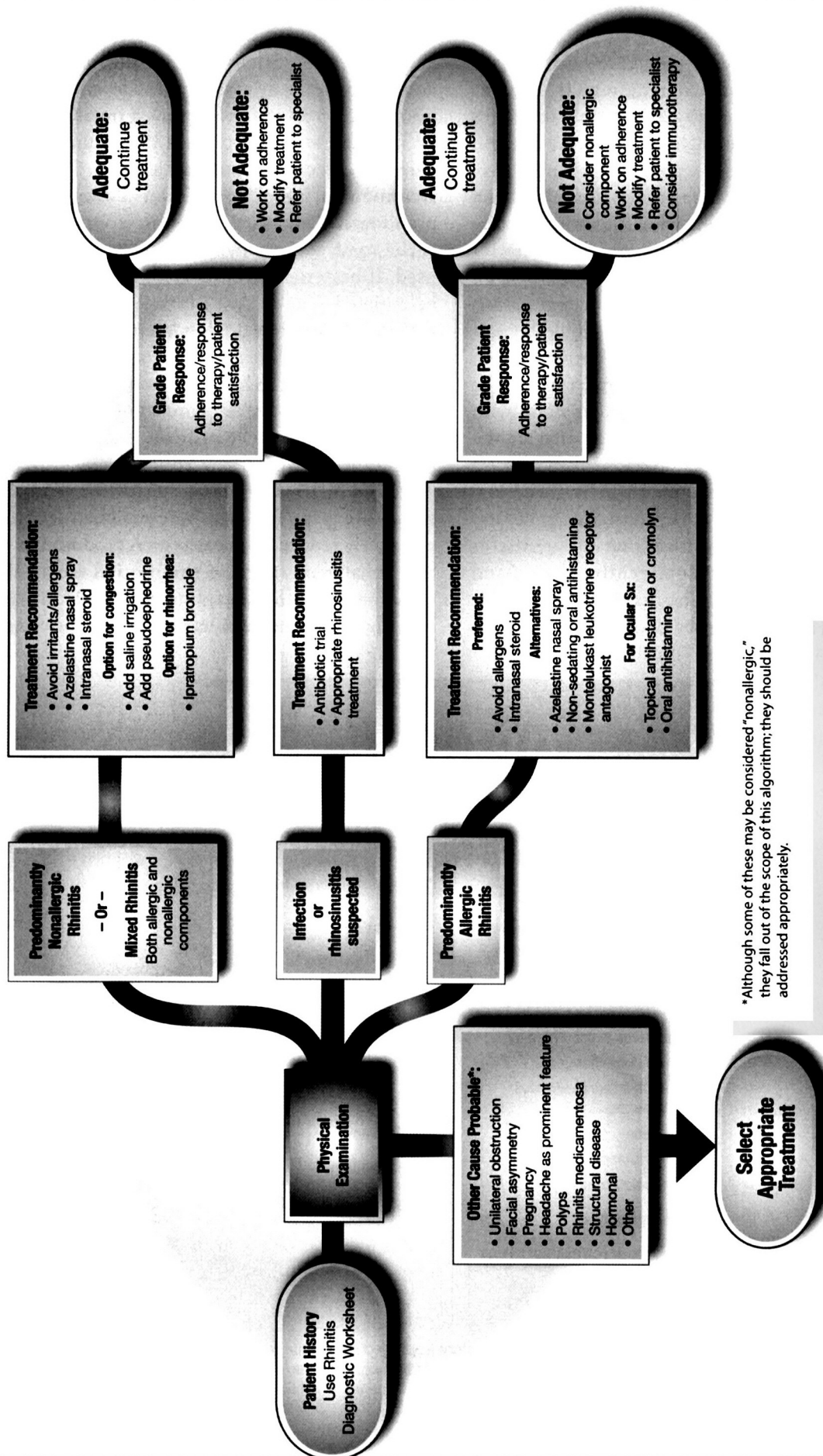


Figure 5. Treatment algorithm illustrating the different treatment approaches for allergic, nonallergic, or mixed rhinitis

of appetite, and urinary retention in males, and they should be used with caution in patients with certain conditions, such as hypertension, arrhythmias, and hyperthyroidism. Topical decongestant nasal sprays (e.g., oxymetazoline and phenylephrine) can also reduce nasal congestion in both allergic and nonallergic rhinitis. However, treatment lasting more than 10 days with these medications leads to tolerance and rebound nasal congestion (rhinitis medicamentosa). Intranasal cromolyn has an excellent safety profile but is less effective than nasal steroids and antihistamines and must be used four times daily for optimal effect. Other options include a topical antihistamine nasal spray or a leukotriene receptor antagonist. Ocular symptoms can be treated with topical H1-antihistamines or topical cromolyn.

The different classes of medications can be used individually, with their selection being guided by the type of symptoms, and in more severe cases, a combination of different classes can be used. These recommendations are in agreement with those of previously published guidelines for the treatment of allergic rhinitis, such as the ARIA guidelines and those from the American Academy of Allergy, Asthma & Immunology (AAAAI) Joint Task Force on Practice Parameters in Allergy, Asthma, and Immunology^{2,20}.

Patients should be re-evaluated 2–4 weeks after initiating treatment to determine their response. If symptoms are well controlled, treatment should be continued. If the response to treatment is inadequate, therapy should be modified and/or the patient should be referred to an allergy specialist for a definitive diagnosis, which may include skin testing or RAST, and further treatment, which may include allergen immunotherapy.

Conclusion

Rhinitis can have a tremendous impact on patients' quality of life because of its deleterious effects on cognitive function and performance at work, at school, and at social functions. In addition, it is an important risk factor for other diseases, especially asthma and sinusitis. It is, therefore, important to identify patients with rhinitis and effectively treat their disease.

Identifying rhinitis subtypes is essential to making appropriate therapeutic choices because different subtypes respond differently to different classes of medication. Making a definitive diagnosis can be difficult and time-consuming; however, a descriptive or suggestive diagnosis can be accomplished quickly while taking a detailed history by using the simple diagnostic checklist developed by the RAD Foundation. The treatment algorithm can then be used to guide therapy

choices based on a patient's rhinitis type. Follow-up evaluation is recommended to grade the patient's response to therapy and determine the need to alter the treatment approach or refer the patient to a specialist.

In conclusion, the practical tools developed and presented by the RAD Foundation are designed to help the clinician identify a patient's rhinitis subtype and make individualized treatment decisions based on the rhinitis type, leading to more appropriate therapy choices and potentially better outcomes.

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