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CLOSING THOUGHTS: IMPLICATIONS OF THE FINDINGS FROM THE NATIONAL ALLERGY SURVEY ASSESSING LIMITATIONS FOR THE MANAGEMENT OF ALLERGIC RHINITIS IN AMERICA

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Introduction

Stuart W. Stoloff, MD

Today, virtually all physicians working in primary care will have a significant caseload of patients with allergic rhinitis (AR). Yet, many physicians still regard AR as a relatively unimportant “nuisance” illness and only treat the symptoms on an as-needed basis. Likewise, many patients do not realize that effective treatments are available that can help control their condition and assume that they just have to live with their symptoms. However, the incidence of AR has grown dramatically in recent years, and it is associated with significant morbidity.¹ For example, as well as experiencing troublesome nasal symptoms, patients with AR have an increased risk of suffering associated conditions such as asthma, rhinosinusitis, and chronic otitis media, which themselves increase morbidity and medical costs.^{2,3} It is also well known that AR has a significant impact on the quality of life of the sufferer,⁴ with days lost from work or school.^{5,6}

Ten years ago, the Institute of Medicine published “Crossing the Quality Chasm,” which identified key weaknesses in the quality of American health care.⁷ Increasing patient-centered care was identified as one of the “six aims for improvement.” This meant that health care should respect and respond to patient preferences, needs, and values, and that patient values should guide all clinical decisions. In 2006, the Allergies in America: A Landmark Survey of Nasal Allergy Sufferers was conducted to assess how well we manage our patients who have nasal allergies.⁸ At the time, it was the largest and most comprehensive national survey of patients with AR and the health care providers who treat them. The survey revealed a number of truths. It highlighted that AR was not just a seasonal problem and that more than half of patients suffered symptoms throughout the year.⁹ It showed that, at their peak, nasal allergy symptoms left patients feeling tired, miserable, and irritable and, for most patients in the survey, decreased their performance at work. Importantly,

the survey also uncovered gaps in communication between physician and patient. For example, fewer than half of patients who had seen a physician reported following his or her instructions on the management and treatment of AR.⁹

Five years after the landmark survey was conducted, we wanted to see how the treatment of nasal allergies had progressed in America. This supplement presents results from the Nasal Allergy Survey Assessing Limitations (NASAL; www.nasalsurvey.com), a study sponsored by Teva Respiratory, LLC, which included many of the same questions as the earlier survey. NASAL provided an up-to-date assessment of patient and provider perspectives concerning AR and nasal allergies in the United States (US). It included a national sample of 400 persons aged ≥ 18 years who had been diagnosed with AR, nasal allergies, or hay fever, and had experienced nasal allergy symptoms or taken medication for their condi-

NASAL provided an up-to-date assessment of patient and provider perspectives concerning allergic rhinitis and nasal allergies in the United States.

tion in the past 12 months. To determine the burden of disease of AR, a telephone survey was conducted among a national probability sample of 522 adults sampled by random-digit dialing. This parallel survey of the general adult US population yielded a subsample of 400 persons aged ≥ 18 years who did not currently have nasal allergies. The comparison of the 2 samples of adults with and without nasal allergies provided a new and unique measure of the impact of nasal allergies on the health and lifestyle of patients. Finally, another parallel survey was conducted among 250 health care practitioners who saw patients with nasal allergies.

NASAL was the first survey of its kind to include the full range of health care practitioners involved in the management of nasal allergies. It included 100 physicians in adult primary care specialties (family medicine and internal medicine), 100 specialists (allergy and otolaryngology), and 50 nurse practitioners and physician assistants.

The purpose of NASAL was to describe the symptoms, burden of disease, and treatment of AR. The articles

DISCLOSURE

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in this supplement report new data from NASAL showing the significant impact AR has on quality of life, the comorbidities associated with AR, and the oft-forgotten patient perspective. During the preparation of these articles, the most common phrase from our authors was, “Don’t get me started...” Each author has passionate views on the current treatment of nasal allergies in America, and these are shared in the roundtable discussion presented at the end of the supplement. ■

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Allergic rhinitis substantially impacts patient quality of life: Findings from the Nasal Allergy Survey Assessing Limitations

Eli O. Meltzer, MD; Gary N. Gross, MD; Rohit Katial, MD; and William W. Storms, MD

TAKE-HOME POINTS

- People with allergic rhinitis (AR) rate their overall health significantly lower than individuals without nasal allergies.
- Compared with the general population, more people with AR complain of difficulty getting to sleep, waking up during the night, lack of a good night's sleep, or a combination of these, as a result of their nasal symptoms.
- More than half of individuals with AR describe their symptoms as impacting daily life a lot or to a moderate degree.
- More adults with AR report that their health limits them from doing well at work compared with adults without nasal allergies, and their estimated productivity drops by an average of 20% on days when their nasal symptoms are at their worst.

DISCLOSURES

Eli O. Meltzer, MD, has received grant/research support from and served as a consultant/advisor and a speaker for Alcon, Sunovion/Sepracor, and Teva Pharmaceuticals. Dr. Meltzer has received grant/research support and served as a consultant/advisor for AstraZeneca, Boehringer Ingelheim, and Procter & Gamble. He has served as a consultant/advisor and a speaker for Dey and Merck. He has received grant/research support from Amgen, Apotex, GlaxoSmithKline, HRA, MedImmune, Novartis, and Schering-Plough. He has served as a consultant/advisor for Alexza, Bausch & Lomb, Forest, ISTA Pharmaceuticals, Johnson & Johnson, Kalypsys, Meda, ONO, Optinase, and Rady Children's Hospital San Diego. He has served as a speaker for Allergists for Israel, American College of Asthma & Immunology, and Florida Allergy Asthma & Immunology Society.

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Introduction

Allergic rhinitis (AR) is a common chronic medical condition, affecting at least 40 million people in the United States (US).¹ The overall prevalence of AR has been increasing since the early 1980s across all age, sex, and racial groups and is one of the most common chronic diseases among all age groups in the US.² AR can often be a debilitating condition, which, if untreated, can result in considerable health-related and economic consequences. For example, numerous studies have demonstrated that poorly controlled symptoms of AR contribute to decreased health-related quality of life (HRQoL), reduced sleep quality, daytime fatigue, impaired learning, impaired cognitive functioning, and decreased long-term productivity.^{3,4} One study evaluating the impact of AR and asthma on HRQoL found that people with AR were more likely to report problems with social activities, difficulties with daily activities, and decreased feelings of mental well-being than people without AR.⁵ Moreover, as discussed by Hadley et al⁶ later in this supplement, the presence of AR is directly linked to exacerbations of other inflammatory airway diseases, such as asthma, chronic otitis media, and rhinosinusitis and thus has additional important health implications.

Despite the fact that the symptoms of nasal congestion, sneezing, rhinorrhea, and nasal itch can be very troublesome to the patient, many people with AR do not seek medical advice regarding treatment, choosing instead to self-treat with home remedies and over-the-counter medications.⁷ This may be because AR is perceived by both patients and the health care community as less important than other airway diseases such as asthma. However, nasal allergies are responsible for substantially more disability than is generally realized, and it has been estimated that AR results in significant absenteeism with 3.5 million lost workdays and 2 million missed school days each year.⁸ When other factors related to presenteeism (ie, performance deficits) are included, this rises to an estimated 28 million days of restricted activity or reduced productivity because of AR annually in the US.⁹ Thus, it is evident that the general population lacks an understanding of the symptom burden of AR, its associated risks for other respiratory complications, and its ability to compromise all aspects of an individual's QoL.

The Nasal Allergy Survey Assessing Limitations (NASAL; www.nasal-survey.com), a study sponsored by Teva Respiratory, LLC, was the first national survey to measure the burden of disease of AR in the US by comparing the health status of adults with current hay fever, AR, or nasal allergies (N = 400) with a national sample of adults without nasal allergies (N = 522). The objective of this aspect of the survey was to examine the impact of AR on patient-perceived health status, daily activities, and emotional status. Full details of the survey methods are provided elsewhere in this supplement.

Results of the Nasal Allergy Survey Assessing Limitations

Impact of Nasal Allergies on Patient-Perceived Health Status

Although the majority of people with AR reported a good overall health status (excellent 11%; very good 29%; good 34%), when compared with adults without nasal allergies it became clear that AR patients rated their overall health significantly lower. Nearly twice as many adults without nasal allergies rated their health as excellent (23%), compared with AR patients (11%), and at the other extreme, nearly twice as many AR patients rated their health as only fair/poor/very poor (27%) compared with adults without nasal allergies (15%) (FIGURE 1).

Nasal Allergy Symptoms

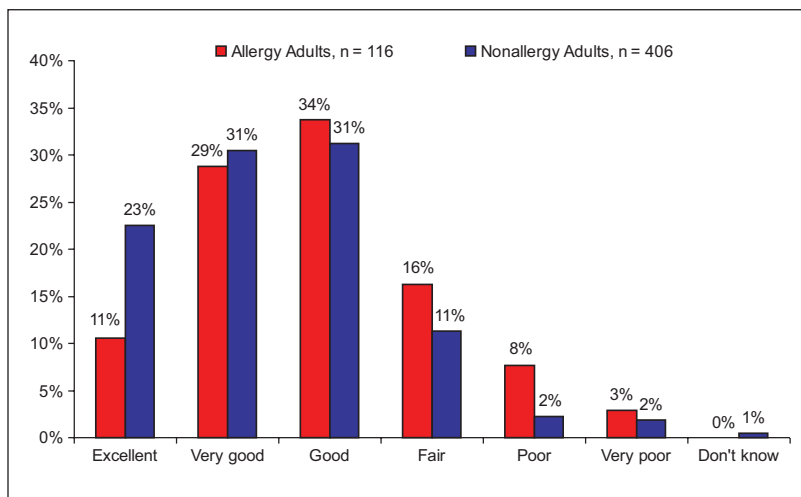
The most frequent allergy symptoms may not be the most bothersome, so this national sample of adults with nasal allergies was asked how troubled they had been in the past week by 6 specific allergy symptoms (FIGURE 2). About half of these allergy sufferers reported that they had been extremely, moderately, or somewhat bothered in the past week by sneezing (50%) and nasal congestion (49%). Slightly fewer than half were at least somewhat bothered in the past week by postnasal drip (46%) and runny nose (41%) and more than a third were at least somewhat bothered by headaches (37%).

When asked how these symptoms affected their daily life during their worst allergy symptoms month, 33% reported that the condition affected their daily life either a lot or a moderate amount, 23% reported some impact, 22% said it only affected their life a little, and 21% said it did not really impact their daily life at all, even during the worst month. Thus, more than half the AR patients described their symptoms as impacting life a lot, a moderate degree, or some.

Nasal Allergies and Sleep Disturbance

NASAL was one of the first surveys to provide a specific focus on the impact of nasal allergy symptoms on sleep disturbances among AR sufferers in the US. Overall, 34% reported that they have been troubled (somewhat/mod-

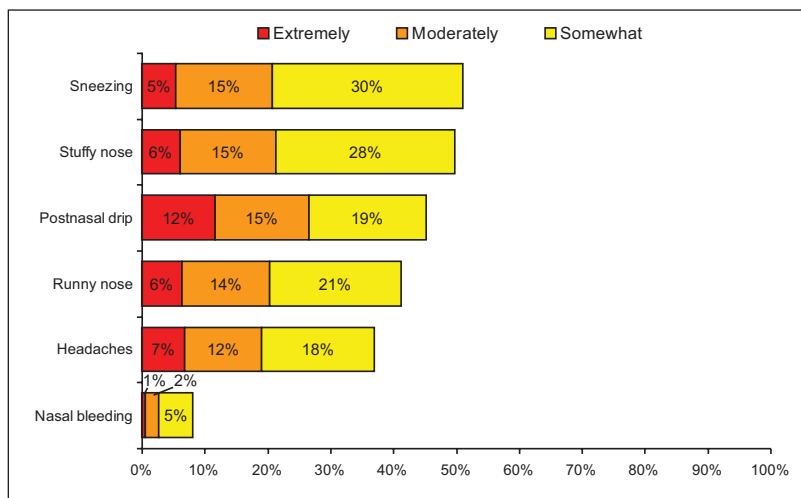
FIGURE 1 Respondent-rated general health status: Nasal allergy vs nonallergy*



All respondents were asked: In general, would you say that your health is excellent, very good, good, fair, poor, or very poor?

Base: All respondents, N = 522; *Pearson chi-square, $P \leq 0.05$.

FIGURE 2 Patient-rated troublesomeness of nasal allergy symptoms in the last week

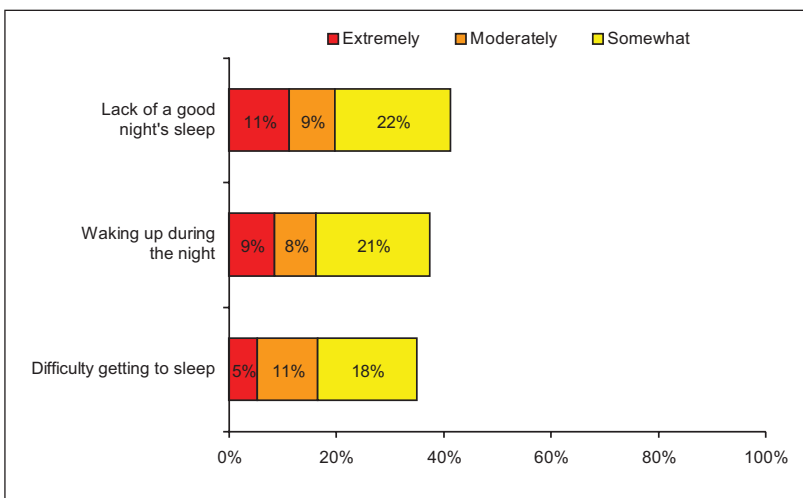


Patients with nasal allergies were asked: How troubled have you been by these symptoms during the last week? Were you not at all troubled, hardly troubled, somewhat troubled, moderately troubled, or extremely troubled?

Base: All respondents, N = 400.

erately/extremely) by difficulty in getting to sleep, 38% reported that they have been troubled by waking up during the night, and 42% reported that they have been troubled by lack of a good night's sleep in the past week as a result of their nasal allergy symptoms (FIGURE 3). Compared with the general population, more patients with AR reported that

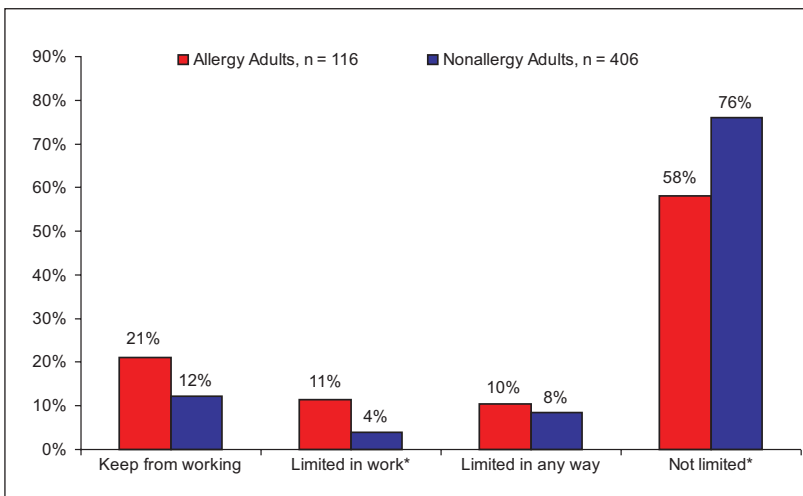
FIGURE 3 Patient-rated problems with sleep in the last week



Patients with nasal allergies were asked: How troubled have you been by each of these symptoms during the last week as a result of your nasal symptoms? Were you not at all troubled, hardly troubled, somewhat troubled, moderately troubled, or extremely troubled?

Base: All respondents, N = 400.

FIGURE 4 Impact of health on daily life: Nasal allergy vs nonallergy



All respondents were asked: (A) Does your health keep you from working? (B) Are you limited in the kind or amount of work you can do because of your health? (C) Are your activities limited in any way by your health?

Base: All respondents, N = 522. *Pearson chi-square, $P \leq 0.05$.

they had been extremely or moderately bothered by difficulty in getting to sleep (24% vs 8%), at least moderately bothered by waking up during the night (31% vs 13%), and extremely or moderately troubled by lack of a good night's sleep (26% vs 11%) as a result of their nasal symptoms in the past week.

Nasal Allergies and Activity Limitations

Activity limitation provided another measure of the burden of AR. Both patients with AR and those without nasal allergies were asked whether their health kept them from working. If their health did not keep them from working, they were asked whether they were limited in the kind or amount of work they could do because of their health. If they were not kept from working or limited in the kind or amount of work they could do, they were asked if their activities were limited in any way by their health.

As many as 1 in 5 AR patients (21%) reported that their health kept them from working, compared with 12% of adults without nasal allergies. Another 11% of AR patients said that they were limited in the kind or amount of work they could do because of their health, compared with only 4% of adults without nasal allergies. Finally, considerably fewer AR patients said that they were not limited by their health in any way, compared with those without nasal allergies (58% vs 76%, respectively) (FIGURE 4).

Nasal Allergies and Productivity

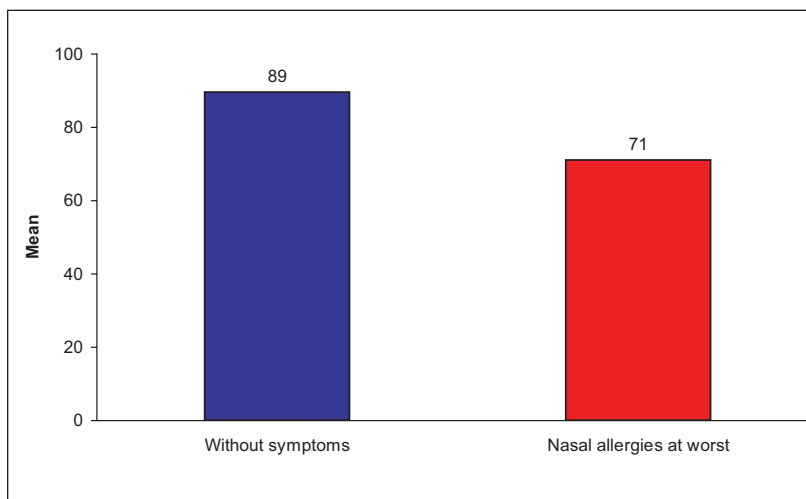
Nasal allergies appear to affect a person's productivity when symptoms are problematic. Respondents in both surveys were asked, on a scale of 0 to 100, in which 100 means 100% productivity, where they would rank their productivity on average days when they did not have an immediate health concern. Adults without nasal allergies ranked their average productivity at 88% on days without immediate health concerns, which was virtually identical to the average reported productivity at 89% for AR patients on days when they were not experiencing nasal allergy symptoms. However, these same AR patients reported that their average productivity was only 71% on days when their nasal allergies were at their worst, representing a 20% decline in productivity of adults as a result of

nasal allergy symptoms (FIGURE 5).

Nasal Allergies and Other Activity Limitations

In order to estimate the impact of nasal allergies on specific activities for adults with AR, both samples were asked how

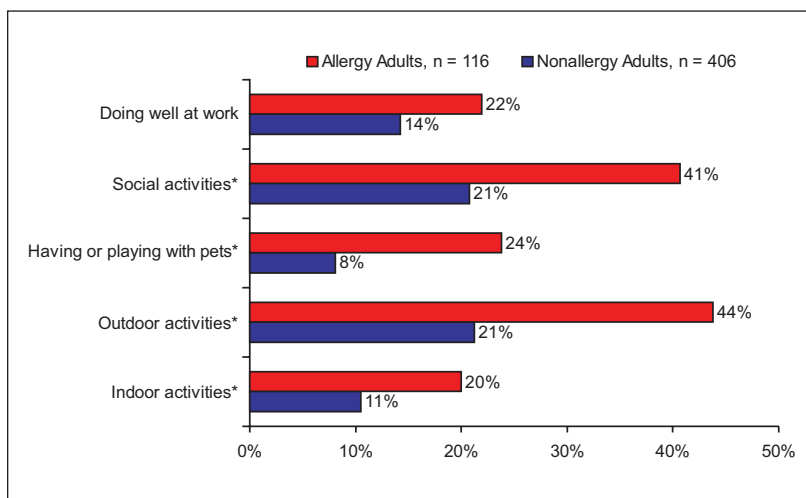
FIGURE 5 Patient-rated impact of symptoms on work productivity



Patients with nasal allergies were asked: (A) Thinking about your productivity at work on a scale from 0 to 100, where 100 means 100% productivity, where would you rank your productivity on days when you don't have nasal allergy symptoms? (B) Where would you rank your productivity on the same scale from 0 to 100, where 100 means 100% productivity, when your nasal allergies are at their worst?

Base: All respondents, N = 400.

FIGURE 6 Impact of nasal allergies on specific activities: Nasal allergy vs nonallergy*



All respondents were asked: How much do you feel that your health limits what you can do in the following areas (doing well at work, social activities, having or playing with pets, outdoor activities, indoor activities)? Do you feel your health restricts you frequently, sometimes, rarely, or never?

Base: All respondents, N = 522; *Pearson chi-square, $P \leq 0.05$.

much their health limited them in 5 activity areas. Nearly twice as many AR patients said that their health limited them in outdoor activities (44% vs 21%) and in indoor activities

(20% vs 11%), compared with adults without nasal allergies. Similarly, more AR patients than adults without nasal allergies felt that their health limited them in social activities (41% vs 21%), doing well at work (22% vs 14%), and having or playing with pets (24% vs 8%) (FIGURE 6).

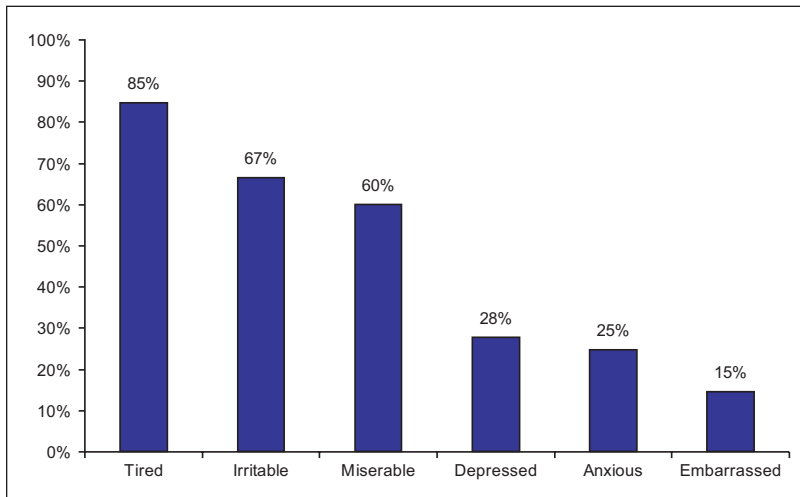
Nasal Allergies and Emotional Burden

Nasal allergies pose an emotional burden of disease, as well as the physical burden of disease. Patients with AR were asked how often they felt certain ways during their worst month. Overall, the majority of AR patients said that they frequently or sometimes experienced emotional problems during the worst month of symptoms: 67% said that they frequently or sometimes felt irritable, 60% said they felt miserable, 28% said they felt depressed, 25% said they felt anxious, and 15% said they felt embarrassed. Even more noteworthy, 85% reported that they frequently or sometimes felt tired during the worst month of allergy symptoms (FIGURE 7).

Discussion

NASAL was the first national survey to measure the burden of disease of AR in the US by comparing the health status of adults with current AR, nasal allergies, or hay fever with a national sample of adults without nasal allergies. The survey clearly demonstrated that nasal allergies imposed a considerable burden. Only a minority of AR patients in this study considered their health to be very good or excellent, and more than 2 in 5 patients (41%) said that their health kept them from working, limited the kind or amount of work they do, or limited them in some other way.

Furthermore, the survey showed that patients were not just troubled by the presence of their AR symptoms, but that AR had added effects on various aspects of their daily life. They were troubled by not being able to sleep well at night because of their symptoms and reported being fatigued and distracted during the day. Nasal problems, particularly nasal congestion and rhinorrhea, led to disordered nighttime breathing and

FIGURE 7 Patient-rated emotional burden during the worst month of symptoms

Patients with nasal allergies were asked: During the worst month of allergy symptoms, how often do you feel (depressed, irritable, tired, embarrassed, miserable, or anxious)—frequently, sometimes, rarely, or never?

Base: All respondents, N = 400.

sleep disturbances.¹⁰⁻¹² Indeed, the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines included sleep disturbances as a key factor in their definition of severity based on the impact of rhinitis on HRQoL.¹³ The widespread experience of fatigue among nasal allergy patients was certainly related to sleep disruption associated with nasal allergy symptoms. It is also possible that rhinitis-disturbed sleep contributed to the very high proportion of AR patients who, in this survey, reported feeling irritable and miserable and, in the more serious cases, has been a cause of feelings of anxiety and depression, reported by up to one-quarter of AR sufferers.

Importantly, NASAL also showed that the burden of disease of AR imposed a social and economic cost on the patient and on society through its impact on work performance. In addition to keeping some allergy sufferers from working, nearly twice as many AR patients reported that their health limited them frequently or sometimes from doing well at work compared with adults without nasal allergies and their estimated productivity dropped from an average of 89% on days when they did not have nasal symptoms to 71% on days when their nasal symptoms were at their worst. These results were in agreement with those of other studies, which reported work impairment in up to 60% of patients with seasonal AR and up to 40% of those with perennial AR.¹⁴ One large US survey published in 2006 found that 55% of employees experienced AR symptoms for an average of 52.5 days per year, was absent from work

3.6 days per year because of AR, and were unproductive in the workplace for 2.3 hours per day because of AR symptoms. The mean total productivity (absenteeism + presenteeism) losses per employee per year were higher (\$593) for AR than for stress, migraine, depression, arthritis/rheumatism, anxiety disorder, respiratory infections, hypertension, diabetes, asthma, and coronary heart disease.¹⁵

Five years ago, another national survey found results similar to those of NASAL regarding the impact of AR on daily life and productivity at work.¹⁶ A key goal of surveys such as this is to raise physician and ultimately patient awareness of the significant physical, social, emotional, mental, and economic impact AR has on the US public. AR is an eminently treatable condition. Environmental controls and immunotherapy are directed toward the triggers and the pathophysiologic process.¹³ Pharmacologic

treatments are generally well tolerated, and studies have long shown that effective therapy can improve sleep quality and reduce daytime fatigue,^{17,18} as well as benefit work productivity¹⁹ and overall QoL.²⁰ The fact that many people with AR do not seek adequate medical advice means that clinicians may not be providing sufficient patient education and that more work on public awareness of the burden of AR is needed. ■

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Comorbidities and allergic rhinitis: Not just a runny nose

James A. Hadley, MD; M. Jennifer Derebery, MD; and Bradley F. Marple, MD

TAKE-HOME POINTS

- Allergic rhinitis (AR) is rarely found in isolation and should be considered in the context of upper and lower airway disease.
- People with AR are at greater risk of suffering asthma, rhinosinusitis, and other related upper airway conditions.
- Most people with both nasal allergies and asthma report that their asthma gets better when their nasal allergies are under control.
- People with AR are more than twice as likely to suffer problems sleeping due to their nasal allergy symptoms.

DISCLOSURES

James A. Hadley, MD, has served on the advisory board for Meda Pharmaceuticals, Teva Pharmaceuticals, and Merck.

M. Jennifer Derebery, MD, has served on the board of directors and scientific advisory board for Sonitus Medical Inc. Dr. Derebery has served on the board of directors for Epic Hearing Healthcare. She has served on the advisory board and as a speaker for Alcon and Sunovion. She has served on the advisory board for Pfizer, SRxA, and Teva Pharmaceuticals. She has served as a speaker for Merck.

Bradley F. Marple, MD, is a consultant for Alcon and has served on the advisory board for Sunovion and Teva Pharmaceuticals.

Introduction

Allergic rhinitis (AR) is a common health problem that affects all ages and is often inadequately treated. Because it is often perceived as just a nuisance, many patients do not seek medical treatment, and others self-medicate with over-the-counter products. However, as discussed by Meltzer et al¹ earlier in this supplement, untreated or inadequately treated AR can substantially impair overall quality of life. Importantly, AR is rarely found in isolation and should be considered in the context of systemic allergic disease. The presence of AR has been associated with numerous comorbid disorders, including asthma,²⁻⁴ chronic otitis media,⁵ rhinosinusitis,^{6,7} and oropharyngeal lymphoid hypertrophy, with secondary obstructive sleep apnea and disordered sleep.⁸⁻¹⁰ Poorly controlled AR can trigger exacerbations of these comorbidities because they often share pathophysiologic (inflammatory) pathways in common with AR.^{11,12} Moreover, if left untreated, AR symptoms themselves can worsen, leading to a spiral of worsening comorbidities.

Although there is significant evidence supporting the link between AR and other comorbidities, most studies have necessarily focused on selected populations and there has been relatively little information on how comorbidities affect the general AR population. The objective of this part of the National Allergy Survey Assessing Limitations (NASAL; www.nasalsurvey.com), a study sponsored by Teva Respiratory, LLC, was to examine the full range of symptoms patients with AR experience and how these symptoms relate to other, potentially more serious conditions. To enable comparison between the prevalence of comorbidities in the AR population (N = 400) and that in the general population, selected results of the general population survey (N = 522) are also included. Full details of the survey methodology have been provided elsewhere in this supplement.

Results of the National Allergy Survey Assessing Limitations Worst Month for Nasal Allergies

Most adults with AR experience symptoms that are worse during certain times of year. In line with this, 76% of AR patients questioned reported that their nasal allergy symptoms have been worse or more frequent during a particular season or time of year in the past 12 months. Of these, most reported that the worst months of their allergy symptoms were in the spring, with 26% reporting March, 58% reporting April, and 44% reporting May as the worst month for allergy symptoms (**FIGURE 1A**). As expected, the most frequently reported symptom was nasal congestion, and 56% of AR patients reported experiencing this congestion every day

or most days during the worst month in the past year. Other common symptoms that occurred every day or most days during the worst month were postnasal drip (48%), repeated sneezing (45%), watering or tearing eyes (41%), rhinorrhea (41%), red or itching eyes (38%), and nasal pruritus (31%). Importantly, not all of the symptoms reported were nasal, as 26% of AR patients reported cough, 21% reported headache, 20% reported throat itching, 18% reported facial pain or pressure, and 16% reported ear pain or pressure every day or most days during the worst month in the past year (FIGURE 1B).

Asthma and Allergy

The survey found a strong relationship between asthma and nasal allergies, with 38% of AR patients reporting that they have been previously diagnosed with asthma. By contrast, only 8% of adults without nasal allergies reported that they have ever been diagnosed with asthma (FIGURE 2A). According to those patients with asthma and nasal allergies, their asthma symptoms are related to their allergy symptoms. The majority of adults with both nasal allergies and asthma (52%) reported that asthma gets better when their nasal allergies are under control; 37% said that their asthma stays about the same when their nasal allergies are under control, and 11% were not sure.

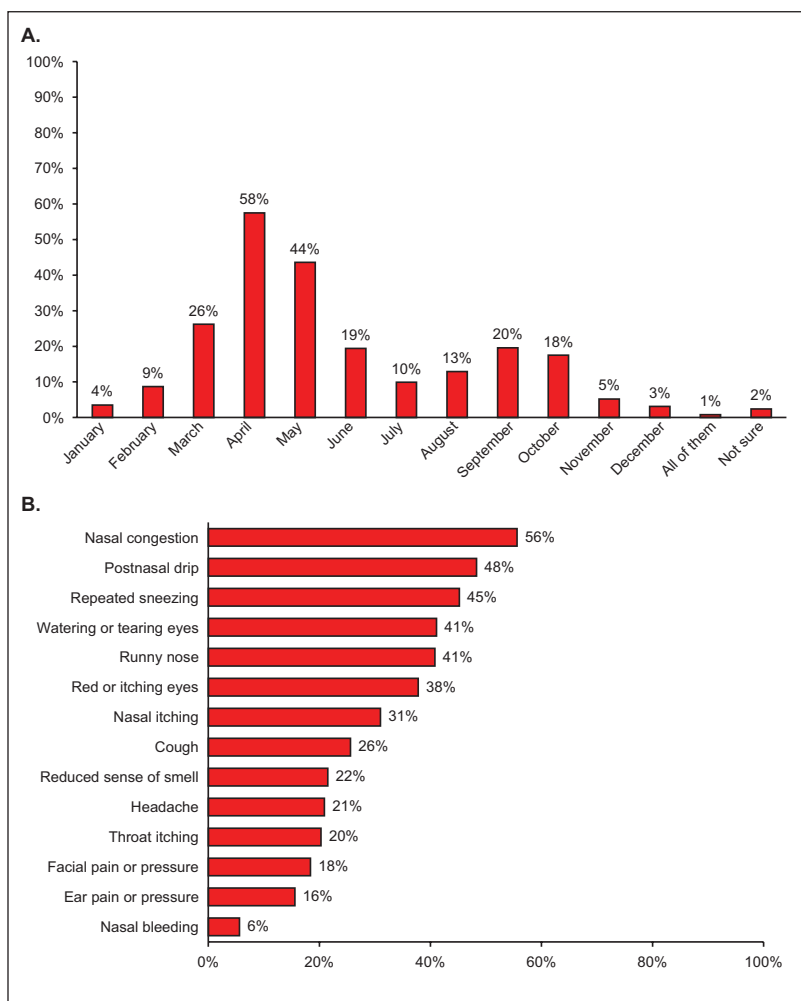
Nasal Allergies and Sinus Conditions

The survey also documents that a strong relationship exists between nasal allergies and sinus conditions, with 66% of AR patients reporting that they also suffer with rhinosinusitis or sinus conditions. By contrast, only 20% of adults without nasal allergies suffer from rhinosinusitis or sinus problems (FIGURE 2B). Moreover, although rhinosinusitis or sinus problems occur in about 3 times as many adults with nasal allergies as without nasal allergies, the proportion of individuals who have ever had nasal or sinus surgery is 7 times higher in adults with nasal allergies as in those without (15% vs 2%).

Other Comorbidities and Impact on Sleep

Compared with the general population, 3 times as many

FIGURE 1 Patient-rated nasal allergies (A) during months when symptoms are worst and symptoms suffered (B) during the worst allergy months



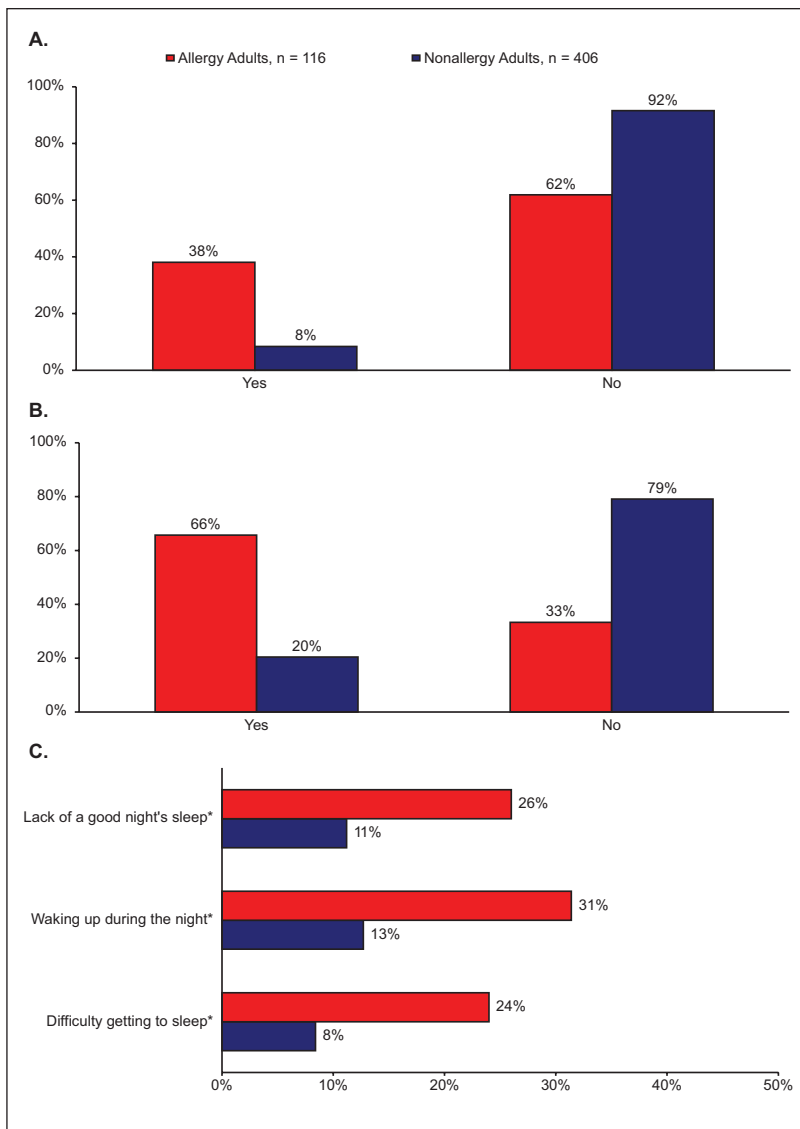
Patients with nasal allergies were asked: (A) During what particular months of the year are your nasal allergies the worst? (B) Which symptoms did you have during the worst one month period in the past year?

(A) Base: Allergies are worst during certain times of the year, n = 305; (B) Base: All respondents, unweighted, N = 400.

adults with nasal allergies reported that they had been extremely or moderately bothered by difficulty getting to sleep in the past week (24% vs 8%); twice as many reported being at least moderately bothered by waking up during the night as a result of their nasal symptoms in the past week (31% vs 13%) for any health-related reason; and more than twice as many adults with nasal allergies were extremely or moderately troubled by lack of a good night's sleep as a result of the nasal symptoms (26% vs 11%) (FIGURE 2C).

Finally, when questioned about other problems suffered in the past 4 weeks, the proportion of adults with

FIGURE 2 Incidence of specific comorbidities associated with allergic rhinitis in the allergy vs general population: (A) asthma,* (B) rhinosinusitis,* and (C) sleep problems*



Respondents were asked: (A) Have you ever been diagnosed with asthma? (B) Do you suffer from sinusitis or sinus problems? (C) How troubled have you been by each of these symptoms (difficulty getting to sleep, waking up during the night, lack of a good night's sleep) during the last week as a result of your health? Were you not troubled, hardly troubled at all, somewhat troubled, moderately troubled, or extremely troubled?

Base: All respondents, N = 522; *Pearson chi-square, $P \leq 0.05$.

nasal allergies who have had rhinosinusitis, sleep disturbances, earaches, skin rashes, heartburn, gastroesophageal reflux disease, migraines, sleep apnea, conjunctivitis, and chronic tonsillitis were all noticeably higher in patients with AR than in people without nasal allergies. Indeed, a large number of adults without AR (66%) did not

have any comorbidities, while only 29% of adults with AR did not report any (FIGURE 3).

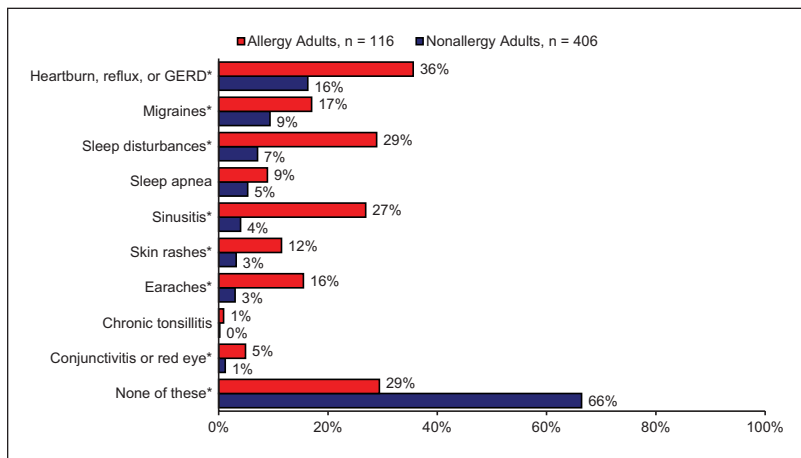
Discussion

The results of this survey clearly demonstrate that compared with the general United States (US) population, people who have AR are at greater risk of suffering associated comorbidities such as asthma, rhinosinusitis, and other conditions noted previously. Although this is not novel information, most clinical trials have studied these associations only in selected populations, and the current study involving a more representative sample of US allergy sufferers confirms the high prevalence of comorbidities in the "real world."

Many physicians and patients often dismiss AR as "just a runny nose," but the results of the present survey clearly show that, especially during the worst spring months, patients with AR suffer a diverse range of symptoms. Although nasal congestion and postnasal drip are the most common symptoms, it is important to note that up to 20% of AR patients reported nonnasal symptoms, such as headache, facial pain or pressure, and ear pain or pressure, *every day* or *most days* during the worst month in the past year. Again, this information is not really new: the Allergies in America survey in 2006 found results on symptom frequency that were very similar to the findings of this survey.¹³ However, it is important information that needs to reach physicians and patients alike because effective management of AR would likely alleviate many nonnasal symptoms.¹⁴

This tendency to ignore or deprioritize AR in the face of other symptoms is very common in people who suffer the various comorbidities associated with AR; a person with asthma and AR is more likely to worry about their symptoms of wheezing than about their rhinorrhea. However,

it is increasingly understood that these disorders are deeply connected at the pathologic level. For example, despite differences in the anatomic location of AR and asthma, they share a common inflammatory pattern in which many upper airways cells and mediators are

FIGURE 3 Incidence of other comorbidities associated with allergic rhinitis in the allergy vs general population

Respondents were asked: During the past 4 weeks, have you had heartburn, reflux or gastroesophageal reflux disease (GERD), migraines, sleep disturbances, sleep apnea, sinusitis, skin rashes, earaches, chronic tonsillitis, conjunctivitis or red eye, or none of these?

Base: All respondents, N = 522; *Pearson chi-square, $P \leq 0.05$.

the same as those involved in lower airway disease.^{4,12} Supporting the concept of a “unified airway disease,” bronchial hyperresponsiveness and subclinical changes in the lower airways can be detected even in patients with AR who do not have asthma.¹⁵ As demonstrated in this survey, the presence of AR symptoms is associated with a worsening in asthma control and patient quality of life. The presence and type of asthma is influenced by sensitization, and the duration and severity of AR.⁴ However, much evidence suggests that effective AR management can lead to a better asthma control. Indeed, AR often precedes the onset of asthma and studies have shown that treatment with specific immunotherapy can prevent or delay asthma onset.¹⁶

As demonstrated in this study, rhinosinusitis is another common complication of AR, which can lead to inflammation of the sinus mucosa and obstruction of the sinus drainage pathway or ostium.^{6,17} Moreover, rhinosinusitis may be implicated in the genesis of nasal polyps, which are common when rhinosinusitis complicates AR. Although the reasons for nasal surgery were not collected in this survey, it is interesting to note the relatively high proportion of patients with AR who have had nasal surgery (15%), which may have included surgery to remove nasal polyps.

Common pathologic pathways can also explain the higher prevalence of other comorbidities seen in the survey of AR patients compared with the general population. Allergic rhinitis involves inflammation of the mucous membranes of the nose, eyes, eustachian tubes, middle ear,

paranasal sinuses, and pharynx. Allergen exposure in the nasopharynx with release of histamine and other mediators can cause eustachian tube obstruction, possibly leading to middle ear effusions.¹⁸ Similarly, chronic allergic inflammation of the upper airway causes oropharyngeal lymphoid hypertrophy with prominence of adenoidal and tonsillar tissue. This is important, as retrospective analysis of medical claims data has shown that claims for rhinosinusitis, tonsillitis, otitis media, migraines, and asthma all increase during the allergy season with significant increases in the cost of treatment.¹⁹ Finally, the survey also confirmed the significant impact of AR on sleep quality. Several studies have found that AR patients, and particularly those with nasal congestion, often have significant sleep disturbances leading to fatigue, daytime somnolence, and impaired daytime functioning as reflected in lower levels of pro-

ductivity at work or school.^{8,10} As discussed in more detail by Meltzer et al¹ earlier in this supplement, sleep problems and the associated daytime fatigue are common problems reported by many AR patients. There may be a link between AR patients being tired and feelings of depression and anxiety. Therefore, although there is no direct pathologic link between AR and mental health, they certainly should be considered as serious potential consequences of uncontrolled AR.

In summary, the NASAL survey found that patients with AR are at a higher risk of other comorbidities compared with the general US population. Moreover, it showed that these comorbidities were exacerbated during the spring months when the symptoms of AR are worst. It therefore follows that timely diagnosis and treatment should be a priority for patients and physicians, not only to control AR symptoms but also to improve the management of associated diseases. ■

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Insights on allergic rhinitis from the patient perspective

Leonard M. Fromer, MD; Gabriel Ortiz, PA; Sandra F. Ryan, NP; and Stuart W. Stoloff, MD

TAKE-HOME POINTS

- Although intranasal steroid sprays are the preferred treatment of the majority of health care providers, this opinion is not carried through to patient treatment.
- Approximately two-thirds of adults with nasal allergy symptoms report that they use over-the-counter, nonprescription medicines, and only one-third report that they use an intranasal steroid spray.
- Lack of familiarity and poor patient awareness are key barriers to intranasal steroid spray use.
- Dissatisfaction related to side effects among users of these medications leads some of those who are familiar with intranasal steroid sprays to discontinue use after it has been prescribed.
- Improved health care provider–patient communication and education is a vital step toward improving the long-term management of allergic rhinitis.

DISCLOSURES

Leonard M. Fromer, MD, has no conflicts of interest to disclose.

Gabriel Ortiz, PA, has received research grants, served on the advisory board, and served as a consultant/advisor and a speaker for Merck and Teva Pharmaceuticals. Mr. Ortiz has received research grants and served on the advisory board and as a speaker for Genentech and Phadic US. He has served as a consultant/advisor for Dey and Sunovion.

Sandra F. Ryan, NP, has no conflicts of interest to disclose.

Stuart W. Stoloff, MD, has served as a consultant/advisor and on the advisory board for Teva Pharmaceuticals. Dr. Stoloff has served as a consultant/advisor for Alcon, AstraZeneca, and Merck.

Introduction

Allergic rhinitis (AR) is a growing challenge for primary care because most AR patients consult primary health care providers (HCPs) who generally make the diagnosis, initiate treatment, give the relevant information, and monitor the condition.¹ It is already a very common disease, affecting up to 40% of the population in young adults, and its prevalence is ever increasing.^{2,3} The effective management of AR involves allergen avoidance, pharmacotherapy, immunotherapy, or a combination of these methods.⁴ Options for pharmacotherapy include intranasal corticosteroids, oral and intranasal antihistamines, intranasal chromones, oral and intranasal decongestants, oral and intranasal anticholinergic agents, and antileukotrienes. Of these choices, the Allergic Rhinitis and Its Impact on Asthma (ARIA) guidelines state, “intranasal glucocorticosteroids are recommended for the treatment of allergic rhinitis in adults and children. They are the most effective drugs for the treatment of allergic rhinitis.”⁴ Although effective treatments have been available for many years, numerous studies show that the care offered to patients is often suboptimal, with significant problems of patient nonadherence to medication.⁵ Considering that AR is usually a long-term condition and that patient adherence to prophylactic therapy directly impacts long-term symptom control, it is vital that all efforts are made to improve medication adherence.

Medication nonadherence is a complex issue with many contributing factors.⁶ Reasons for nonadherence in patients with chronic illnesses include patient self-efficacy, social support, disease knowledge, costs, and side effects. In addition, it has been shown that physicians contribute to patients' poor adherence by prescribing complex regimens, failing to explain the benefits and side effects of a medication adequately, not giving consideration to the patient's lifestyle or the cost of the medications, and having poor therapeutic relationships with their patients.⁶ In many areas of medicine, there is often a significant mismatch between the way a patient and physician view the illness in question.⁷⁻¹⁰ It is therefore important that physicians treating AR understand the patient perspective and take this into account when planning long-term management of the patient's symptoms. The objective of this part of the National Allergy Survey Assessing Limitations (NASAL; www.nasalsurvey.com), a study sponsored by Teva Respiratory, LLC, was to examine patients' perspectives (N = 400) on their experiences with AR and its management, focusing in particular on the attributes of nasal allergy medications that contribute to patient satisfaction with therapy. To promote a better understanding of how the patient perspective matches the HCP perspective, data from the HCP survey (N = 250) are also included. The sample of HCPs included a national sample of 200 physicians in direct patient care in outpatient settings in the United States, including 100 in adult primary care

specialties (family medicine and internal medicine), 100 specialists (allergy and otolaryngology), and 50 nurse practitioners (NPs) and physician assistants (PAs). Full details of the survey methodology have been provided elsewhere in this supplement.

Results of the National Allergy Survey Assessing Limitations

Allergy Triggers

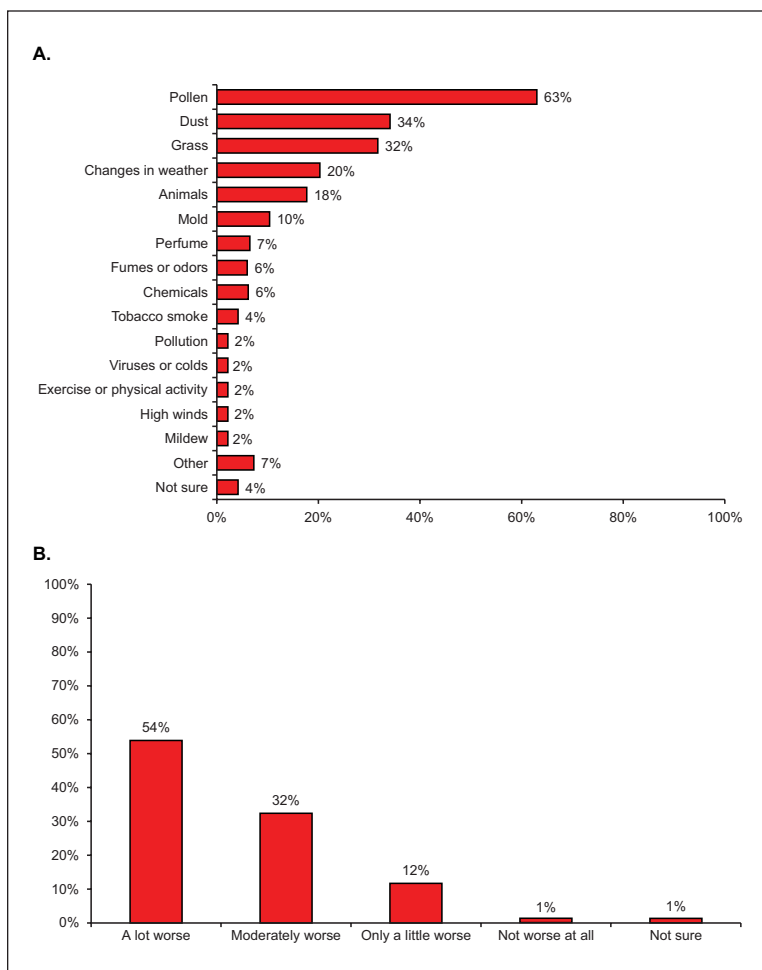
Nasal allergy symptoms may be triggered by allergens, and different allergens may affect individuals in different ways. Hence, the first question asked of this national sample of adult nasal allergy sufferers was what things usually trigger or make their nasal allergy symptoms worse. Adults with nasal allergies most commonly volunteered pollen (63%) as the usual trigger or thing that worsens their symptoms; other common triggers were dust (34%); grass (32%); changes in weather (20%); animals (18%); mold (10%); perfume (7%); fumes or odors (6%); chemicals (6%); and tobacco smoke (4%) (FIGURE 1A). The survey further showed that these triggers often have a large effect on the severity of nasal allergy symptoms. More than half of adults with nasal allergies (54%) reported that these triggers made their allergy symptoms a lot worse, 32% reported that these triggers made their allergy symptoms moderately worse, and just 13% reported that the triggers made their symptoms only a little worse or not worse at all (FIGURE 1B).

Preferred Classes of Medications for Nasal Allergy Symptoms

Results of the HCP survey clearly showed that prescription intranasal steroid sprays or inhaled corticosteroids are the preferred choice of most HCPs (all HCPs, 67%; allergists, 94%; otolaryngologists, 68%; primary care physicians [PCPs], 67%; NP/PAs, 40%) for adults with moderate to severe persistent allergy symptoms. This preference was supported by the fact that virtually all HCPs said that they believe the benefits probably or definitely outweigh the drawbacks of intranasal steroid sprays for the management of nasal allergies. Only a very small proportion of PCPs (4%) and NP/PAs (6%) said that the drawbacks probably or definitely outweigh the benefits in the management of nasal allergies.

By contrast, although the vast majority of patients (83%) reported taking some type of medication for their nasal aller-

FIGURE 1 (A) Nasal allergy triggers and (B) effect on nasal allergy symptoms



Respondents were asked: (A) What things usually trigger or make your nasal allergy symptoms worse? (B) Do these triggers usually make your allergy symptoms a lot worse, moderately worse, or only a little worse than normal?

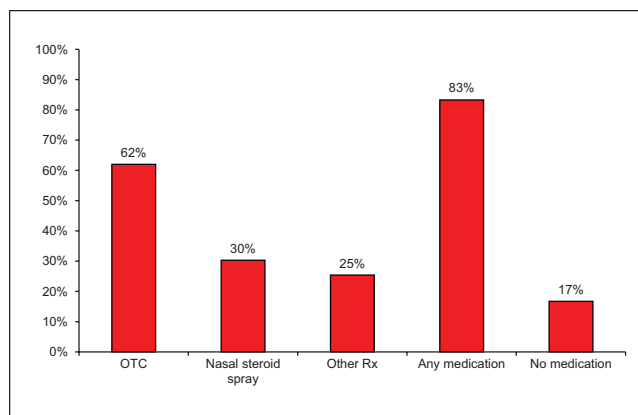
Base: All respondents, unweighted, N = 400.

gies in the past 4 weeks, only 30% reported using an intranasal steroid spray. Instead, 62% of patients reported using over-the-counter (OTC), nonprescription medicine, 25% reported using some other type of prescription medication, and 17% reported that they took none of these types of medication (FIGURE 2).

Perceived Control of Nasal Allergies

Although the majority of allergy sufferers reported being at least somewhat bothered by nasal congestion and sneezing in the past week, most patients (53%) described their allergies as completely controlled or well controlled in the past week. On the other hand, 36% of respondents said that their

FIGURE 2 Medications used by the patient in the preceding 4 weeks



Patients were asked: (A) In the past 4 weeks have you used any over-the-counter, nonprescription medicine to relieve your nasal allergy symptoms? (B) In the past 4 weeks have you used any intranasal steroid spray for your nasal allergy symptoms? (C) Have you taken any (other) prescription medications for your nasal allergies in the past 4 weeks?

Base: All respondents, unweighted, N = 400.

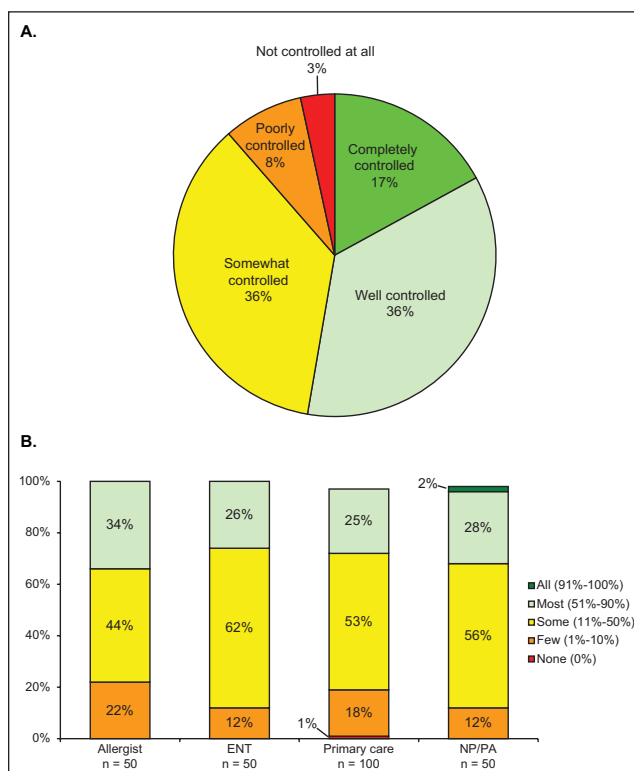
allergies were somewhat controlled in the last week, and 11% described their allergies in the last week as poorly controlled or not controlled at all (FIGURE 3A).

In contrast to the patients' report, HCPs were generally less positive about how well controlled their patients' nasal allergies were. Almost one-third of HCPs (all HCPs, 28%; allergists, 34%; otolaryngologists, 26%; PCPs, 25%; NP/PAs, 30%) felt that all or most of their patients with nasal allergies would be classified as completely controlled or well controlled in May or June. Most HCPs (all HCPs, 53%; allergists, 44%; otolaryngologists, 62%; PCPs, 53%; NP/PAs, 56%) felt that some of their patients with nasal allergies would be classified as completely controlled or well controlled in May or June. Surprisingly, a small number of HCPs (all HCPs, 17%; allergists, 22%; otolaryngologists, 12%; PCPs, 19%; NP/PAs, 12%) felt that few or none of their patients have completely controlled or well-controlled allergies in May or June (FIGURE 3B).

Patient Perceptions of Intranasal Steroid Sprays

There appeared to be many reasons why the physicians' preferred choice of AR medication was not always used in practice. First, 37% of AR patients reported that they were not too familiar, not at all familiar, or did not know how familiar they were with intranasal steroid sprays for nasal allergies. Of the 63% of AR patients who reported at least some familiarity with intranasal steroid sprays, nearly half (49%) said that they had

FIGURE 3 Perceived control of nasal allergies symptoms: (A) patient perspective and (B) health care provider perspective



(A) Patients were asked: Overall, how well would you say that your nasal allergies have been controlled in the last week? Would you say they were completely controlled, well controlled, somewhat controlled, poorly controlled, or not controlled at all?

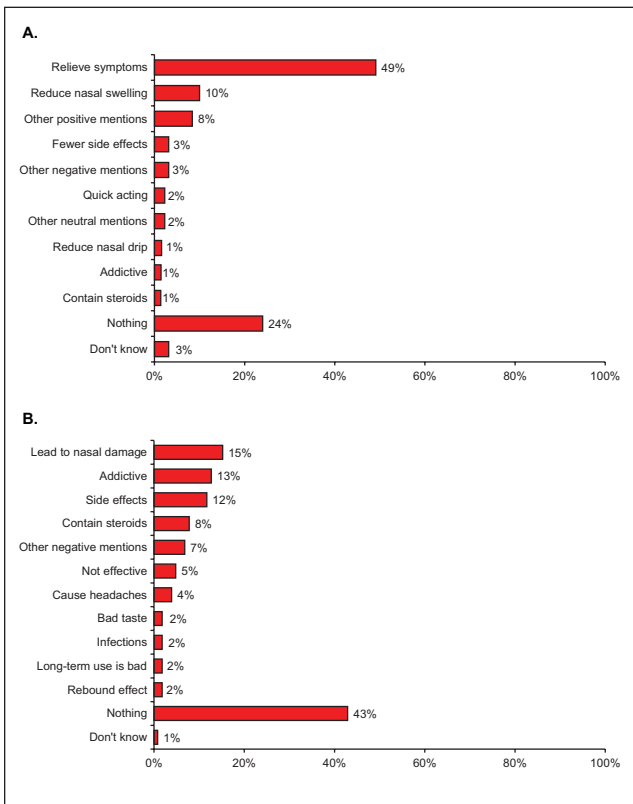
Base: All respondents, unweighted, N = 400.

(B) Health care providers were asked: What proportion of your patients with nasal allergies would you classify as having completely controlled or well-controlled allergies in May or June? All (91%-100%), most (51%-90%), some (11%-50%), few (1%-10%), or none (0%)?

Base: All respondents, N = 250.

heard intranasal steroid sprays relieved symptoms and 10% thought that intranasal steroid sprays reduced nasal swelling (FIGURE 4A). Patients who had some familiarity with intranasal steroid sprays were also asked what, if anything, bad they had heard for these drugs. The most commonly volunteered concerns were: they lead to nasal damage (15%), they were addictive (13%), there were side effects (12%), they contain steroids (8%), they are not effective (5%), and they cause headaches (4%) (FIGURE 4B). Further questioning revealed that the majority (64%) of these patients with nasal allergies said that, based on what they knew or had heard, the benefits of steroid nasal sprays definitely or probably outweighed the

FIGURE 4 Patient perceptions of nasal steroid medications: (A) good things they have heard or (B) bad things they have heard



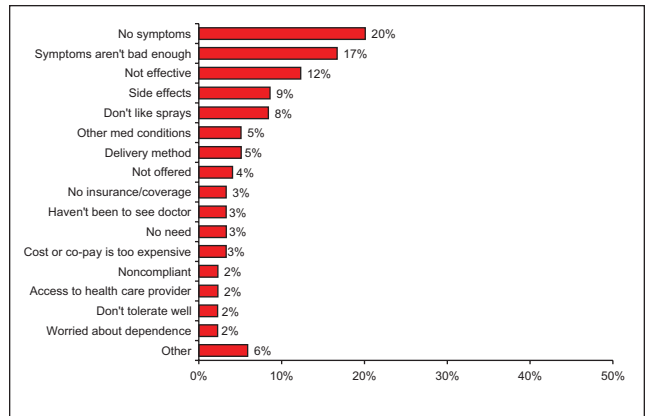
Patients who were familiar with intranasal steroid sprays were asked: (A) What good things, if any, have you heard about these drugs? (B) What bad things, if any, have you heard about these drugs?

Base: Familiar with intranasal steroid sprays, unweighted, n = 288.

drawbacks, whereas 18% said that drawbacks of intranasal steroid sprays probably or definitely outweighed the benefits, and 18% were not sure.

Patients who had used a prescription intranasal steroid spray for their nasal allergies in the past, but not in the past 4 weeks, were asked why they had not recently used their intranasal steroid spray. Most commonly, past users of prescription nasal sprays said that they had no symptoms (20%) or the symptoms were not bad enough (17%). Other reasons for not using within the past 4 weeks included lack of effectiveness (12%), side effects (9%), poor tolerability (2%), and concerns about dependence (2%). A similar proportion of past users said they had not used prescription nasal sprays in the past 4 weeks because they did not like sprays (8%) or the delivery mechanism (5%). Finally 8% of AR patients reported that they had not used prescription nasal sprays in the past 4 weeks because of barriers to care (no insurance coverage,

FIGURE 5 Patient reasons for not using nasal steroids in the past 4 weeks



Patients who no longer use an intranasal steroid spray were asked: Why haven't you used a prescription intranasal steroid spray for your nasal allergies in the past 4 weeks?

Base: No longer use an intranasal steroid spray, unweighted, n = 158.

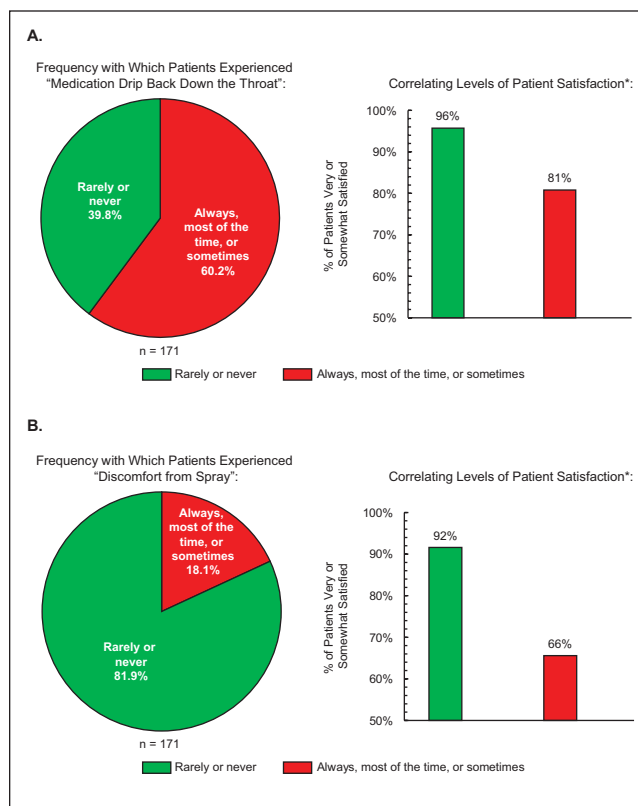
3%; cost or co-pay too expensive, 3%; no access to a provider, 2%) (FIGURE 5).

The survey showed that patient satisfaction with prescription intranasal steroid sprays varies with their experience with side effects. The majority of patients (72%) who have ever used prescription intranasal steroid sprays for their allergies said that, in general, they had been somewhat satisfied or very satisfied with their prescription steroid nasal spray, whereas 19% reported they were somewhat dissatisfied or very dissatisfied. There was a statistically significant difference in satisfaction between those who feel the medication drip down the throat sometimes or more often (81%) and those who rarely or never did (96%) ($P < 0.05$, FIGURE 6A) and an even more dramatic and statistically significant difference in the satisfaction with their intranasal steroid sprays between those who felt any discomfort from these sprays at least sometimes (66%) and those who rarely or never felt discomfort from the sprays (92%) ($P < 0.05$, FIGURE 6B).

Reasons for Using a Particular Intranasal Steroid Spray

Nearly 1 in 10 patients who have used intranasal steroid sprays (8%) said that they had asked their HCP to prescribe a particular intranasal steroid spray (FIGURE 7A). Of these, 40% said they wanted it because they believed it was more effective, 25% said that they did so because of previous experience with that product, 11% said that the product requested was easier to administer, and 11% said that the product they

FIGURE 6 Patient satisfaction with intranasal steroid sprays, based on frequency of side-effect experiences: (A) feeling the medication drip down the throat and (B) feeling discomfort from the spray



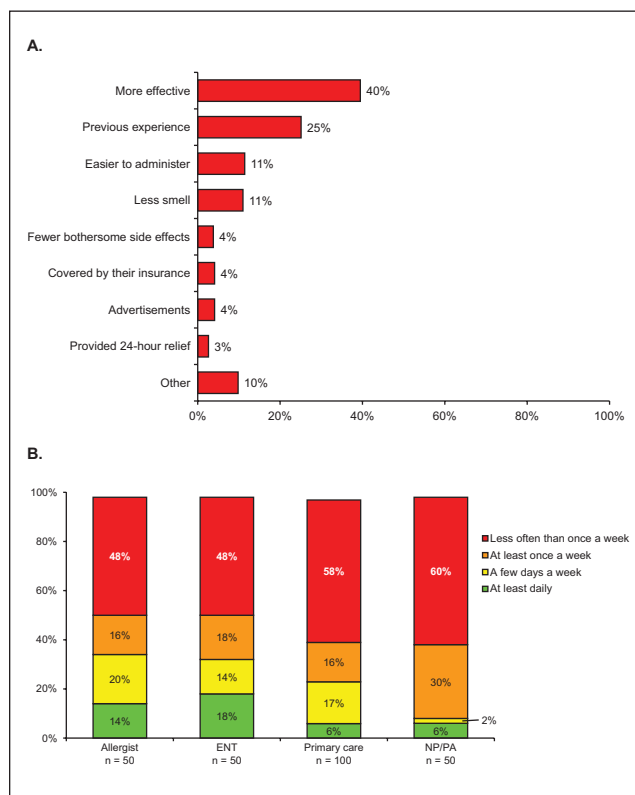
Patients who had used intranasal steroid spray within the past year were asked: When you use your intranasal steroid spray, how often do you (A) feel the medication drip down the throat or (B) feel any discomfort from the spray: always, most of the time, sometimes, rarely, or never? Patients were also asked: In general, how satisfied were you with the prescription intranasal steroid spray you used for your nasal allergies in the past?

Base: Used intranasal steroid spray in the past year, unweighted, n = 171; *Pearson chi-square, $P \leq 0.05$.

requested had less smell. Only 4% of those who requested a specific intranasal steroid spray said that they did so because it was covered by their insurance or because of an advertisement.

On the other side of the table, HCPs were asked how often their patients asked them to prescribe a particular intranasal steroid spray. A number of allergists and otolaryngologists reported that they were asked to prescribe a particular intranasal spray at least daily (14% and 18%, respectively), a few days a week (20% and 14%), or at least once a week (16%

FIGURE 7 Requests for a particular nasal spray: (A) patient reasons and (B) frequency of patients requesting a particular spray



(A) Patients who had asked to be prescribed a particular intranasal steroid spray were asked: Why did you want that particular medicine?

Base: Asked to be prescribed a particular intranasal steroid spray, unweighted, n = 25.

(B) Health care providers were asked: How often do your patients ask you to prescribe a particular intranasal steroid spray: at least daily, a few days a week, at least once a week, or less often than once a week?

Base: All respondents, N = 250.

and 18%). Substantially fewer PCPs (6%) and NP/PAs (6%) reported requests for specific intranasal steroid sprays on a daily basis. But nearly 2 in 5 PCPs (39%) and NP/PAs (38%) said that patients asked them to prescribe a particular intranasal spray at least once a week (FIGURE 7B).

Interestingly, although only 4% of patients who asked for a specific intranasal steroid spray said they did so as a result of advertisements, many health care practitioners perceived this as a major reason their patients asked for specific intranasal steroid sprays. Over half (56%) of PCPs whose patients asked for certain sprays thought that their patients had done so because of advertisements. Advertisements were also seen

as the reason their patients were asking for specific intranasal steroid sprays by a substantial number of allergists (28%), otolaryngologists (32%), and NP/PAs (26%). Aside from advertisements, HCPs reported recommendations by family and friends and previous experience as key reasons for their patients asking for particular intranasal steroid sprays. Similarly, whereas patients only rarely said that insurance coverage was a reason for choosing a particular steroid spray, a small number of HCPs (all HCPs, 11%: allergists, 16%; otolaryngologists, 12%; PCPs, 8%; NP/PAs, 11%) saw this as a reason their patients were asking for specific products. Indeed, 20% of allergists and 12% of otolaryngologists said that their patients asked them for particular intranasal steroid sprays because they cost less.

Almost 1 in 5 allergy sufferers reported asking their HCPs to change the intranasal steroid spray they were taking because they were dissatisfied with it. The main reasons cited were that the spray was ineffective (67%) and that it had bothersome side effects (28%), whereas a few cited dissatisfaction because of effectiveness that began to wear off after a time (6%) or dissatisfaction that the spray did not provide 24-hour relief (3%). HCPs tended to agree that some of their patients with AR asked them to change their intranasal steroid spray because they were dissatisfied with it. Interestingly, although almost half of physicians (all HCPs, 46%: allergists, 54%; otolaryngologists, 46%; PCPs, 42%) reported that some of their patients have asked them to change their intranasal steroid spray because of dissatisfaction, most NP/PAs report that only few or none of their allergy patients have asked for a different prescription because they were dissatisfied with the intranasal steroid spray. Like patients, about half of HCPs say that the reasons that their patients who ask them to change their prescription are dissatisfaction with their intranasal steroid spray are effectiveness (all HCPs, 52%: allergists, 37%; otolaryngologists, 53%; PCPs, 53%; NP/PAs, 60%) and bothersome side effects (all HCPs, 45%: allergists, 67%; otolaryngologists, 39%; PCPs, 46%; NP/PAs, 26%). By contrast, payment issues were perceived as a much smaller reason for change (all HCPs, 14%); only 12% of allergists, 20% of otolaryngologists, 13% of PCPs, and 9% of NP/PAs reported that their patients ask them to change their intranasal steroid spray because the co-pay was too high. Even fewer reported that their patients ask them to change their intranasal steroid spray because it was not covered by insurance (all HCPs, 8%: allergists, 4%; otolaryngologists, 12%; PCPs, 9%; NP/PAs, 6%).

Discussion

The results of this survey clearly show that although intranasal steroid sprays are the preferred treatment of the majority

of HCPs, this professional opinion is not carried through to patient treatment.

The survey found that 62% of adults with nasal allergy symptoms reported using OTC, nonprescription medicines and only 30% use an intranasal steroid spray. This may reflect the fact that 43% of the respondents had not seen a HCP about their nasal allergies in the past year. Interestingly, although the majority of patients with AR believed their symptoms to be well controlled or somewhat controlled, HCPs were less positive about how well controlled their patients' nasal allergies were. This discrepancy may be because of differences in patient and provider perceptions and expectations of effective treatment. For example, patients may be more accepting of suboptimal control from the OTC medications that they have been using for many years, whereas HCPs have more knowledge and experience with all types of AR medication and have higher expectations of current treatment. Indeed, considering that it is the HCP preferred treatment option, patient familiarity with nasal allergy sprays was relatively low, with 37% of AR patients reporting unfamiliarity. Further, of those patients who had at least some familiarity, less than half said that they had heard intranasal steroid sprays relieved symptoms while many voiced concerns (such as the potential for nasal damage and addiction, and the fact they contain steroids), which could easily be managed by effective HCP-patient communication. Indeed, such communication and patient education lies at the heart of the current drive to place the patient at the center of the health care team.

Surveys conducted in asthma have shown that when a patient rated his or her disease education (information provided) and overall asthma care experience as good, his or her adherence to daily steroid use increased. Conversely, a poor rating of the patients' disease education and satisfaction with their asthma care had a clearly negative effect on adherence to daily use.¹¹ Similar to asthma, effective control of moderate to severe AR with intranasal steroid sprays usually entails the regular prophylactic use of the medication. Because of their mechanism of action, the maximum efficacy of intranasal sprays may require up to 2 weeks to fully develop.⁴ However, this fact did not appear to be well understood by the AR patients included in this survey because many of them cited the current lack of symptoms or the presence of only milder symptoms as reasons not to use their intranasal steroid spray. Moreover, patient-perceived lack of effectiveness was the most common reason for asking to change their nasal spray medication. Such information about the difference between prophylactic and rescue medication would be critical to patient satisfaction, especially if they are expecting immediate relief from symptoms.

Importantly, the survey also showed that patients' satisfaction with prescription intranasal steroid sprays varied with their experience with side effects. Although the majority of patients who had ever used prescription intranasal steroid sprays stated satisfaction with their prescription steroid nasal spray, there was a statistically significant reduction in satisfaction in patients who felt the medication drip down the throat and in those who reported any discomfort from these sprays. Indeed, of those patients who asked their HCP to change the intranasal steroid spray they were taking because they were dissatisfied with it, almost a third (28%) cited bothersome side effects as the main reason. Given the facts that involving the patient in medication choice is generally found to increase adherence and that 1 in 5 patients in this survey showed that they were happy to request a switch in medication if they were not satisfied, it is vitally important that HCPs regularly ask their patients about how they are doing with their medication, and that they stay informed of the many alternative treatment options (including new formulations and delivery devices) that are increasingly available.¹²

In summary, the findings from NASAL suggest that only a minority of adults with current nasal allergies were being treated with the preferred choice of treatment of the medical community. Lack of familiarity with intranasal steroid sprays may have inhibited their use by some patients. But dissatisfaction related to side effects among users of these medications lead some of those familiar with the medication to discon-

tinue use after it was prescribed. Improved HCP-patient communication is a vital step to improving the long-term management of AR, which should in turn help to reduce the burden of this disease affecting tens of millions of Americans. ■

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Closing thoughts: Implications of the findings from the National Allergy Survey Assessing Limitations for the management of allergic rhinitis in America

Stuart W. Stoloff, MD; James A. Hadley, MD; and Eli O. Meltzer, MD

Authors of papers presented in this Supplement met in person at the 2011 Annual Meeting of the American College of Allergy, Asthma & Immunology to further discuss the clinical, social, and economic implications of the findings from the Nasal Allergy Survey Assessing Limitations (NASAL; www.nasalsurvey.com), a study sponsored by Teva Respiratory, LLC. This paper represents an edited transcript of their discussion.

Given the recent changes in US health care, how should the results of the NASAL 2010 survey be used to inform current practice? What about the role of other health care professionals and what are the cost implications of the survey findings?

Dr. Hadley: Firstly, it is important to note that there were improvements in the design of the NASAL 2010 survey compared to its 2006 predecessor. More importantly, although some of the 2010 information was a little bit different, we found that the majority of patients still suffer from their symptoms, and that the symptoms are predominant and bothersome. Allergic rhinitis bothers their

sleep; it bothers their work and daily activities. In other words, we have not really seen any difference in achieving a reduction of the patients' symptoms from 2006 to 2010.

Dr. Meltzer: Looking at this issue more globally, I think that the lack of change has a great deal to do with the public not understanding what "health" is. The World Health Organization (WHO) definition of health is there should be no problems with physical, social, emotional, or mental well-being. Individuals often do not appreciate how healthy they could be, and thus do not have a reference point. The NASAL survey clearly shows that most nasal allergy sufferers are not aware of an appropriate respiratory health goal and, further, they are not cognizant of the magnitude of their disease due to their allergic rhinitis. I believe the patients are not the only ones who are unaware; I think many clinicians are also not aware of the extent of their patients' morbidity. A current problem is that there is not enough assumption of responsibility; patients are not taking enough responsibility for their health, clinicians are not adequately managing these patients, and—despite the suggested health care reforms—there does not appear to be in the foreseeable future a system that is going to alter these conditions.

Dr. Stoloff: For example, many family physicians only ask the question "How are you (with respect to this topic)?" and patients often say they are fine, and that's the end of the dialogue. But consequences of this type of discussion are that costs of health care continue due to the lack of health. So the person misses work or the person's job performance is less than it would be because they don't recognize what their health could be if they were properly treated. As far as they're concerned, this situation has been going on year after year, and it is only when they are really bad that they know they should be somewhat better. Even then, most people do not fully appreciate what is achievable because no one in the health care system has ever told them, "You should be able to sleep through the night and wake up feeling well. You should be able to go

DISCLOSURES

Stuart W. Stoloff, MD, has served as a consultant/advisor and on the advisory board for Teva Pharmaceuticals. Dr. Stoloff has served as a consultant/advisor for Alcon, AstraZeneca, and Merck.

James A. Hadley, MD, has served on the advisory board for Meda Pharmaceuticals, Teva Pharmaceuticals, and Merck.

Eli O. Meltzer, MD, has received grant/research support from and served as a consultant/advisor and a speaker for Alcon, Sunovion/Sepracor, and Teva Pharmaceuticals. Dr. Meltzer has received grant/research support and served as a consultant/advisor for Astra Zeneca, Boehringer Ingelheim, and Procter & Gamble. He has served as a consultant/advisor and a speaker for Dey and Merck. He has received grant/research support from Amgen, Apotex, GlaxoSmithKline, HRA, MedImmune, Novartis, and Schering-Plough. He has served as a consultant/advisor for Alexza, Bausch & Lomb, Forest, ISTA Pharmaceuticals, Johnson & Johnson, Kalypsys, Meda, ONO, Optinase, and Rady Children's Hospital San Diego. He has served as a speaker for Allergists for Israel, American College of Asthma & Immunology, and Florida Allergy Asthma & Immunology Society.

to work. You should be able to participate in athletic, recreational venues to be healthy.” No one has brought that up, and as long as this situation continues, the cost for the patient, his or her family, and health care will continue to increase.

Dr. Hadley: One of the things that I see as an otolaryngologist is that there is also often a missed diagnosis. Everybody who comes in to see me tells me: “Doctor, I have ‘sinus.’” I think most of them are simply unaware of that fact that their nasal congestion plays a role in developing their sinus symptoms. So there is general unawareness of the importance of treating nasal allergies in the lay public, as well as in primary care physicians who have to deal with these patients. Going to issues of cost, I think that patients are seeing the economy go down, and this means that they don’t want to spend a lot of money on their health care. They have a lot of other worries, and I think this is playing a role in how we have to deal with our patients.

Allergic rhinitis is clearly underestimated in terms of its burden. It is too often unrecognized or ignored as an inconsequential problem.

Dr. Stoloff: People need to understand that the cost of not spending money to be healthy has a consequence that is sometimes the greater cost of being unhealthy—cost in terms of morbidity, cost in terms of missed days from work, absenteeism, presenteeism, poor ability to function in the usual domains of physical, social, emotional, and mental.

Dr. Hadley: That’s what the public just does not understand. We have not achieved the goal of informing the lay public and practitioners about how effective management can get these patients better, reduce their costs, and enable patients to go back to work and their activities.

What should be done to better act on the challenges highlighted by these important surveys? Is there a need to increase the awareness of allergic rhinitis among health care providers?

Dr. Meltzer: If we’re not making progress then we have to make some changes. It seems to me that education could drive change. The public needs to better understand that it is not insignificant to have an inflammatory process called allergic rhinitis. Allergic rhinitis is clearly underestimated in terms of its burden. It is too often unrecognized or ignored as an inconsequential problem. It is important that the person who has allergic rhinitis does not disregard the burden

of disease. The NASAL survey reports that allergic rhinitis affects the ability to sleep well in 40% of patients. We know that allergic rhinitis also compromises people’s activities and we know that they are not as productive when they’re at work. We also know there are many comorbidities—asthma in particular, and sinusitis, otitis, conjunctivitis are other common associated conditions. Patients and clinicians need to be educated to appreciate the significant morbidity associated with allergic rhinitis, and that nasal allergies need attention and effective control.

Dr. Hadley: One of the things that we all see is patients not always getting important information about the medications that they take; there is a walk-in to the grocery store and the pharmacy shelves are filled with medications that are over-the-counter. The problem is there is not enough education about what the benefits are and what the side effects are of all those medications. There is also a lot of direct to consumer advertising—radio, television, etc., that

also leads to misconceptions about the benefits of some of these medications. Patients are somewhat aware that they have a problem, but they just don’t know where to go. From the health care provider perspective, the emphasis is on treating the major problems—diabetes,

hypertension—and rhinitis is considered a minor problem. So I don’t think we are educating our patients well enough. And I think that is a misconception and misunderstanding, which should be corrected.

Dr. Stoloff: Most physicians will see on their schedule a brief description of what problems their upcoming patients have. In primary care, the person filling the schedule will often say that the patient with nasal symptoms has sinusitis, which overwhelmingly it is not. That is an “easy” quick visit and the typical conversation is “Here, take this pill—if you’ve tried that pill, then take this nasal inhaler—and if you didn’t like this one I’ve got another sample for you. And then we’ll figure out which one is going to be on your list, what is covered by your insurance, and what’s the generic.” There is very little discussion about the type of impairment suffered and the overall burden on the individual. Importantly, that burden is often substantial, especially if nasal allergy symptoms were the primary reason for the office visit.

In primary care, people can have a multitude of other conditions, and allergic rhinitis is down at the bottom of the list. For example, the patient may be a hypertensive diabetic who also has seasonal allergic rhinitis. So by the time a family doctor gets to discuss allergic rhinitis, the office visit time is over and it is easier for the physician to just give a medi-

caution. But when the presence of allergic rhinitis has an enormous influence on the other diseases as far as activity, sleep, fatigue, depression, all the other emotional components, as well as physical components, that the survey highlighted—that really needs to be brought to the attention of both the patient and the health care provider to spend the appropriate time discussing it. Because it will influence care in everything else the person does.

How would you work up a patient who you might consider as potentially having allergic rhinitis?

Dr. Meltzer: When physicians view their schedule, a word or phrase supposedly informs them in advance of the patient's condition. In reality, every patient is different and, moreover, patients with allergic rhinitis vary over the course of days, months and years in their symptomatology. So when I evaluate a patient for rhinitis and their chief complaint is "I'm having problems with my nose," I first find out the full range of symptoms, and which symptom is for them the most bothersome (most often it will turn out to be congestion). Secondly, I would find out whether the symptoms are intermittent, or persistent. If they are fairly persistent, this informs me about somewhat of their severity, which is another very important consideration. Thirdly, I would try to find out what are the triggers for the symptoms such as non-allergic precipitants (eg, climate changes, tobacco smoke, and other environmental pollutants), or specific allergen triggers (eg, pets, springtime pollens). I would also ask about any comorbid conditions because if they are having more than just nasal symptoms that expands what I am going to need to address. I need to know all of those things before I make a treatment plan. If the disease is intermittent and mild or not very bothersome, then I am going to initiate a modest management plan. If their allergic rhinitis is more problematic, then I will need to educate the patient about what they have, why they have it and what to do about it. The patient and I will need to agree about our expectations of treatment. We are going to have an action plan for the short-term as well as a plan for follow-up visits to see if in fact our initial plan is successful. Again, the specifics will depend upon the individual patient.

Dr. Hadley: Many patients come in to an ENT clinic with an inappropriate initial diagnosis, predominantly with sinus disease, and some of them actually have come in with inappropriately obtained CT scans of the paranasal sinuses because they were presumed to have a chronic sinus infection. Most importantly, many of them have come in with inappropriately administered multiple different courses of antibiotics, which is of concern to me. So I agree with Dr.

Meltzer in the need to understand the history of the patient's symptoms—whether they are intermittent or persistent. I also obtain a family history, which helps me to work out whether the patient has an allergic tendency or not. I also have to look back and see what medications have been tried, what has worked (and not worked) in the past. The timing of the medications is really important, and the patient's own perceptions about whether they want a medication that is going to be beneficial, or whether they want a simple remedy also plays a role. Also, let's not forget what Dr. Meltzer also talked about—environmental controls that can be helpful to reduce the patient's symptomatology as well.

Dr. Stoloff: From my perspective, I'm always impressed how a simple explanation of what allergy actually is, in terms of definition and measurement, creates a totally different dialogue with the patient. When my patients come in, they are often past the point of just administering a medicine, and trying others if it didn't work—especially now there are so many generic over-the-counter products in oral antihistamines available. As a consequence, I really want to talk to them about what is going on—what is the family history, what is the seasonality of the components. I live at a fairly substantial altitude with little or no humidity, so some of the environmental issues that are very clear in San Diego where Dr. Meltzer practices have no role in my patients. However, some of the people I've seen have come in with pages of an expensive serum test that shows positive for certain items that have no influence on the patient's current environment.

Patient history has to guide our workup. Dr. Hadley's point about family history was important; we look to document what in fact are the causes. If we can figure out what is pushing the disease forward, maybe we can prevent some of those problems or at least lessen them. The history also helps in diagnosis. If we find by their history they're over-using topical decongestants, that's important. If we find they're using their intranasal spray in the wrong way, that's important. After obtaining the patient history, we then need to individualize our workup based on physical examination. It is important to look in the nose; if we find they have mechanical problems that's additional information. Certainly allergic specific testing can be helpful, but it has to be targeted based on the location and based on the patient's story.

Dr. Meltzer: We also need to target treatment. As Dr. Hadley mentioned, we need to know what has and hasn't worked in the past and what are the contributing mechanism of the rhinitis for a given patient—is it only allergic, is it infectious, is it nonspecific irritants, is it mechanical, or

is it a mixture of all of these. Pharmacologic therapy can be stepped up or stepped down depending upon the patient's progress. And immunotherapy is certainly an appropriate choice in patients who have more severe disease and/or who are not responding adequately. Individualization is the key in terms of management.

Dr. Hadley: There is a clear need for the identification of and appropriate care of patients who need further management. As clinicians, we glean from patients' history when they have symptoms and when we can appropriately add to the phar-

Pharmacologic therapy can be stepped up or stepped down depending upon the patient's progress. Individualization is the key in terms of management.

macological management other therapies that would be beneficial in helping patients control their environment a little bit better during specific times of the year. Some patients do need additional treatment at certain times of the year. For example, whereas patients with intermittent symptoms only need to be treated for a short period of time each year, other patients are plagued with year-round symptoms. So we have to gauge those patients appropriately.

Dr. Stoloff: Another point is that at times comanagement with an allergist or otolaryngologist will be beneficial to the patient. But the primary care physician has to recognize that and it takes time to have that discussion. Unfortunately, because allergic rhinitis is often trivialized (from a health care provider's point of view), physicians do not step back to see how much of a burden this disease is for that individual. This lessens the opportunity to gain effective consultation in the specific fields, and therefore lessens the opportunity for better health for the patient.

How do current guidelines influence your current treatment practice? Which guidelines are useful?

Dr. Meltzer: The ARIA guidelines originate from a WHO program, initiated in 1999, to create an international appreciation of the morbidity associated with allergic rhinitis. They borrowed from the NIH guidelines for asthma, the classification concept of intermittent and persistent and rating of the disease into mild, moderate, and severe categories. I think that this is clinically more relevant than the FDA classifications of seasonal and perennial allergic rhinitis. If a person suffers symptoms when they visit a family member with cats for 2 weeks over Christmas—then that's an intermittent problem. It is not

really a "perennial" problem in terms of the allergen. The FDA view may be appropriate for approval of medications, but from the management standpoint of patients, classifications of persistent, intermittent and mild, moderate or severe are much more useful. Indeed US guidelines now also use these classifications.

The name ARIA actually stands for Allergic Rhinitis Impact on Asthma, and the impact on asthma was a key driver for the WHO program. ARIA recognized the concept of the unified airway and the consequence that having inflammation in one area of the airway created for other parts of the airway. The guidelines highlighted the recommendation to evaluate patients with allergic rhinitis for lower airway disease (be it with a pulmonary function or at least a good history), and conversely for patients with lower airway disease to check for an upper airway history of problems as well. This is important because there is crosstalk, and we should be managing the whole airway—reducing inflammation in all of it.

Dr. Stoloff: From my viewpoint, very few of my peers are aware of ARIA and what it recommends. Similarly, many of them are not aware of the differences between the FDA classification and clinical guidelines. They simply do not know that the field is moving away from using seasonal and perennial terminology and towards a redefinition in terms of severity, frequency, and intensity.

Dr. Hadley: I agree that the awareness of the ARIA guidelines in general medical communities is low. We should point out that the American Academy of Asthma, Allergy & Immunology (AAAAI) did publish practice parameters for rhinitis in 2008 and those have made a lot of sense as they give a practitioner a stepwise process to look at whether the symptoms are intermittent versus persistent, the degree of severity, and then makes recommendations on the types of medication that can be of clinical benefit to the patient. These guidelines are much more useful to the primary care physician.

Dr. Stoloff: Speaking as an author of both the ARIA and the AAAAI practice parameters, one of the major problems is that my colleagues in primary care do not routinely read the journals where the guidelines are published. Thus, the information is not disseminated and consequently not incorporated into their clinical practice. If presented and disseminated properly, guidelines should influence the way clinicians look at these health care issues, for the patient's benefit, for cost

benefit, and for improving their practice, gaining better outcome for everyone.

Dr. Meltzer: I think there are some common concepts that have been incorporated into each of the guidelines discussed. Firstly, we need to classify people by severity. Secondly, we need to appreciate that people with upper airway disease (including allergic rhinitis), often have involvement of other areas of the respiratory tract. In other words we need to consider the comorbidities of the associated diseases. Thirdly, once we appreciate the magnitude of the problems, the patient together with the clinician needs to establish goals. Fourthly, there are step recommendations; if the symptoms are mild or intermittent, less management is needed. If the symptoms are moderate to severe, and/or persistent, more intensive management is required. There are also defined therapeutic steps as to when one might include immunotherapy as part of the regimen. Finally, patients should be monitored as part of the long-term management of this chronic condition.

The ultimate goal is control—control based on what the patient's goals were when defined during their discussions with their clinician. If we incorporate those basic five concepts into our clinical practice—it will be good for the upper airway, good for the lower airway, and good for long-term health.

Given the range of products available at present for allergic rhinitis, what criteria influence your choice of product?

Dr. Hadley: The problem is that our patients have problems that they do not consider allergic rhinitis as serious, compared to conditions such as hypertension or diabetes. However, they still have a problem that significantly influences their life. As far as the range of products, many of them have already been on an oral antihistamine and many have used and abused decongestant therapy, which is over-the-counter or now behind-the-counter that they have to ask for. Patients often try to first alleviate their symptoms with some of these products, and by the time they come to see me as a specialist they have already usually started on something already, and I have to look and determine whether or not they would be acceptable to use a more advanced product.

The topical nasal steroid is the pure anti-inflammatory product. We use this to treat the inflammatory state of the patient, recognizing that allergic rhinitis is an inflammatory problem. Antihistamines can reduce some of the

symptoms but not as effectively as some of the topical nasal steroids. Added to that patients obviously have a preference to use a single product that they can use once per day, for most Americans this would ideally mean taking a pill, but unfortunately that's not the best product for them. Our challenge is to change their attitudes and beliefs about appropriate treatment of these problems.

Dr. Meltzer: As an allergist I tend to think about allergic disease not only in terms of what is, but how did it get there. It is important to understand allergic rhinitis as an inflammatory process that involves numerous mediators, cytokines, and inflammatory cells. Oral antihistamines block only one of the mediators; they have no effect on cytokines or inflammatory cells or any of the other mediators. As such, while they can help with itchy noses, sneezing and runny noses, they do not help with congestion—which is the most bothersome and the most frequent symptom. Likewise, anticholinergics only help with runny nose, and are not effective against nasal itch, sneeze or congestion. Most people with allergic rhinitis have chronic disease, and topical decongestants should not be used for prolonged periods of time. Oral decongestants have dose-related side effects and the doses required to effectively reduce congestion increase the risks of irritability, difficulty sleeping and nervousness. Leukotriene modifiers are at best minimal to modest improvers of symptoms. Thus, the intranasal corticosteroids (because of their broad based mechanisms of action) are currently considered to be the best monotherapies.

However, when prescribing intranasal corticosteroids, there are a number of important considerations. First, we should ensure the patient is administering the spray prop-

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erly in terms of the technique. In addition, there may be some patient preference in terms of whether an individual prefers an aerosol formulation or an aqueous formulation. There may also be issues in regard to cost and related to the availability of different agents on a formulary. Indeed, managed care limitations have been problematic for many of us who take care of patients. Furthermore, we certainly need to monitor that patients adhere to their regimen. I find in my practice that most people do not start taking

their medication prior to a season; they wait until they're in the midst of the worst time of their symptomatology and then expect an immediate treatment effect. I try to explain to them, that allergic rhinitis is an ongoing process, a fire, and if effective therapy is established and maintained early on, then the fire can be kept under control and the outcome will be far better than trying to deal with it when there is a flare-up of the major symptoms. This is a communication issue. Every person may have a different view and we need to come to an understanding of each individuals' viewpoint (what their goals of treatment are). We are not going to be able to force a patient to stick with a particular treatment. It's about educating them and encouraging them

Allergic rhinitis is an ongoing process, a fire, and if effective therapy is established and maintained early on, then the fire can be kept under control and the outcome will be far better than trying to deal with it when there is a flare-up of the major symptoms.

to take responsibility. I tell them "when you leave my office, you're the one who has allergic rhinitis and I recommend you take the medication. However, you make the decisions."

Dr. Hadley: We also must not forget that inappropriate patient comprehension and knowledge can also be problematic. Some patients take their medication too late, or perhaps too long, and they have side effects. Side effects can increase the burden of their disease and impact on their ability to perform well at work or school or play.

Dr. Stoloff: Yes, in primary care, especially when treating the older population who have hypertension, one often sees patients take decongestants, and one realizes the multitude of side effects associated with them. And, as Dr. Hadley says, very few patients are aware that their medications are causing these problems.

There are basically three key aspects related to patient communication. Firstly, patient education; we need to ensure our patients are aware of what they have, why they have it and what they can do about it. Secondly, there needs to be ongoing communication between the patient and the clinician to ensure availability of questions and availability of goal setting. Thirdly, patients should have realistic expecta-

tions, because when patients revisit we can assess if we have met their expectations or if adjustments in management are needed.

Dr. Hadley: I agree. Better awareness of the disease burden will improve the patient-clinician discussion and thereby improve the patient-physician relationship. This will enable physicians to better guide their patients through proposed treatment plans.

Another important topic is patient preference. We have discussed that most patients would like a pill that has no side effects or that they can take once a day, perhaps once a week, or a patch that they don't have to deal with. Unfortunately, we

need to recognize that such a medication does not yet exist. Patients who have a problem with the inflammatory process should be seen by the clinician and steered toward the most effective medication, and I personally believe that the topical nasal steroids are the best choice to reduce the

inflammatory process as much as possible. There are new aerosol formulations of topical nasal steroids that will bring more treatment options for allergic rhinitis.

Dr. Meltzer: We should also note that these new developments with regards to new delivery systems address expanding patient choice. There are also a number of combination agents and biologics in development that may also improve pharmacotherapeutic outcomes. Advances in immunotherapy will also help treat the basic cause of allergic disease. I think many of these options will become available within the next few years.

Dr. Stoloff: I concur. The other point that we have made, and I think it's important to reiterate, allergic rhinitis is not in a silo. It is associated with, for most of the population, comorbid diseases. When clinicians look for comorbidities, they often gain a far better appreciation of the value of treating the allergic rhinitis and therefore improving their outcome for other health issues such as asthma. But this needs to be taken in the context of communicating with the patient, always taking patient needs and goals into consideration, and working within the economic health care system that we now face. ■

Appendix

The National Allergy Survey Assessing Limitations (NASAL): Materials and respondent characteristics

Introduction and Survey Objectives

The National Allergy Survey Assessing Limitations (NASAL), a study sponsored by Teva Respiratory, LLC, was designed to use robust data-collection methods to provide a current assessment of patient and provider perspectives concerning allergic rhinitis (AR) and nasal allergies in the United States (www.nasalsurvey.com).¹ The overall objective of the study was to assess the national burden of nasal allergies, both in terms of prevalence as well as the degree of suffering and impact on quality of life. Another key aim was to gain important insights into health care provider and patient perspectives on how well nasal allergies are currently managed in the United States. The survey was designed in collaboration with a group of nasal allergy experts; serving as advisors on the project were: Stuart W. Stoloff, MD; M. Jennifer Derebery, MD; Leonard M. Fromer, MD; Gary N. Gross, MD; James A. Hadley, MD; Rohit Katial, MD; Bradley F. Marple, MD; Eli O. Meltzer, MD; Gabriel Ortiz, PA; Sandra F. Ryan, NP; and William W. Storms, MD. Survey questions were based on those used in the Allergies in America Survey,^{2,3} further questions were added through analysis of the relevant literature.

Survey Populations

The NASAL was composed of three distinct surveys, each of which consisted of telephone interviews with national randomly selected samples. The surveys were conducted by Strategic Pharma Solutions, LLC, in conjunction with the national public opinion research organization, Abt SRBI. The NASAL was sponsored by Teva, a research based pharmaceutical company.

1. Patients with current nasal allergies

A national sample of adult patients with nasal allergies was obtained by systematically screening 4,635 households using a random-digit-dialing telephone survey during May and June 2010 about their condition and treatment. During the telephone screening, an adult member of each household was asked to report the total number of adults in the household and the total number of these individuals ≥ 18 years of age who had been diagnosed

with nasal allergies. Patients ≥ 18 years of age who had been diagnosed by a physician as having AR, nasal allergies, or “hay fever,” and had been either taking medication for AR or had AR symptoms during the past 12 months were eligible for inclusion in the survey. The rationale for including all three clinical conditions was to capture those patients who may not realize that AR is the same condition as nasal allergies, or hay fever. These inclusion criteria ensured a representative sample of patients suffering from active AR. If a household had more than one person eligible for the study, the program randomly selected one member as the designated respondent. Designated respondents were then asked to answer a questionnaire including up to 100 questions, including demographics.

2. National sample

In order to determine the burden of disease of AR, a parallel telephone survey was conducted among a national probability sample of 522 adults also sampled by random digit dialing. Respondents were asked to answer a questionnaire including up to 100 questions, including demographics. This survey of the general adult population of the United States yielded subsamples of persons aged 18 and older with and without current nasal allergies. The comparison of the two samples was designed to provide a new and unique measure of the impact of nasal allergies on the health and lifestyle of adults.

3. Health care provider survey

Finally, a third parallel survey was conducted among 250 health care practitioners who see patients with nasal allergies in an outpatient setting. Telephone interviews were conducted during May and June 2010 (ie, within peak season for nasal allergies) with national samples of five health care provider populations: adult primary care, allergists, otolaryngologists; nurse practitioners and physicians assistants. The adult primary care population was defined as the medical specialties of general practice, family practice, and internal medicine. The samples were drawn as probability samples from the American Medical Association Master List of physicians in the United States. The

nurse practitioner sample was drawn from state licensing board lists and the physician assistant sample was drawn from the membership list of the American Academy of Physician Assistants. Respondents were asked to answer up to 40 questions, including information on medical training and practice location.

Sampling methodology

The maximum expected sampling error for a simple random sample of 400 (eg, the patient survey) is 4.9 percentage points at the 95% confidence level. The maximum expected sampling error for a simple random sample of 100 (eg, primary care physicians) is 9.8 percentage points at the 95% confidence level. The response and non-response rates were also determined.

Weights consisting of cross tabulations and frequencies were used in all analyses to determine critical survey outcomes. The weights corrected for differences between eligible subjects screened and eligible subjects actually interviewed. An age and gender correction was used to adjust results from the interviewed population so that they would be similar to those that would be expected from the screened population of allergy sufferers.

Results

1. Patients with current nasal allergies (Patient Survey)

A total sample of 400 persons aged 18 and older, who had been diagnosed with AR, nasal allergies or hay fever, and who had experienced nasal allergy symptoms or taken medication for their condition in the past 12 months, were interviewed as part of this study. The average duration of the survey was 24 minutes (TABLE).

2. National sample (Cross-Section Survey)

The national sample includes 522 persons aged ≥18 years. Of these, 406 people did not have nasal allergies and 116 were identified as having nasal allergies. The average duration of the survey was 8 minutes (TABLE).

3. Health care professional survey

The health care professional total sample of 250 persons, included a national sample of 200 physicians in direct patient care in outpatient settings in the United States, including 100 in adult primary care specialties (family practice and general internal medicine), 100 specialists (allergy and otolaryngology) and 50 nurse practitioners and physician assistants. The average duration of the survey was 15 minutes (TABLE).

TABLE Breakdown of survey respondents included in the National Allergy Survey Assessing Limitations

Population	Sampling Frame	Interview Length	Completed Sample
Patient Survey: 05/17/2010 – 06/17/2010			
Current Nasal Allergy Aged 18+	National	24 minutes	400
Cross-Section Survey: 05/17/2010 – 06/16/2010			
Survey of Adult Population	National	8 minutes	
–Nasal Allergy			116
–Nonallergy			406
Physician Survey: 05/17/2010 – 06/15/2010			
Health Professional Survey	For Adult Primary Care, ENT, and Allergist: American Medical Association Masterfile	15 minutes	250
–Adult Primary Care			Adult Primary Care: 100
–ENT	For Nurse Practitioners: Nurse Practitioners State Licensing Boards		ENT: 50
–Allergist			Allergist: 50
–Nurse Practitioner	For Physician Assistants: American Academy of Physician Assistants State Licensing Boards		Nurse Practitioner: 25
–Physician Assistant			Physician Assistant: 25

Comments

The NASAL was designed to provide an up-to-date snapshot of the current burden of Allergic rhinitis in the United States. Survey questions can be found on the NASAL website (www.nasalsurvey.com). Strengths of the survey design include its large size, the ability to directly compare subsamples of patients with and without current nasal allergies and the inclusion criteria, which were designed to ensure that the patient sample included people with current allergies. Limitations of the survey are those inherent with all surveys such

as intentional deception, poor memory, or misunderstanding of the question, which can all contribute to inaccuracies in the data. ■

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