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ORIGINAL ARTICLE

Frequency of diagnosis and treatment of allergic rhinitis among adults with asthma in Germany, France, and the UK: National Health and Wellness Survey

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ABSTRACT

Background: Concomitant allergic rhinitis (AR) adds to the symptomatic burden of asthma.

Scope: To determine the proportion of adults with concomitant asthma and AR whose AR is diagnosed and/or treated, data were derived from a cross-sectional, stratified, random sample of 26,468 adults from France, Germany and the UK, participants in the 2004 web-based National Health and Wellness Survey. Patients were drawn from the database if they reported (1) experiencing asthma in the prior 12 months, (2) a physician diagnosis of asthma, and (3) ever experiencing 'nasal allergies/hay fever' (physician diagnosed or self-reported symptoms).

Findings: Of 1139 patients with asthma who reported AR, 203 (18%) did not have a diagnosis of AR. Of these, 86 (42%) pursued over-the-counter self-treatment for AR,

and 117 (58%) remained untreated. Of 936 patients who reported diagnosed AR, 471 (50%) received AR prescriptions, 200 (21%) pursued over-the-counter self-treatment, and 265 (28%) remained untreated. Overall, 34% of patients with asthma and diagnosed or self-reported AR were not treated for AR. There were no significant differences in QoL over the prior 4 weeks, nor healthcare resource use over the prior 6 months between patients treated and those not treated for AR.

Conclusion: Based on self-reported data, despite global treatment guidelines recommending evaluation and treatment of AR among patients with asthma, AR was not diagnosed for 1 in 5 patients, and AR was not treated for 1 in 3 patients with asthma.

Introduction

Asthma and allergic rhinitis (AR) are related inflammatory diseases that affect millions worldwide. They are often comorbid conditions: up to 40% of patients with AR may have asthma, and up to 80–90% of patients with asthma may have AR^{1–3}.

AR usually precedes asthma and is a significant risk factor for asthma¹. In patients with asthma, the concomitant presence of AR adds to their symptomatic burden, leading to a deterioration in asthma control and increased use of medication and healthcare resources, and consequent poor management of asthma^{4–9}.

Our increased understanding of the shared pathophysiology, health impairments, and socioeconomic costs of asthma and AR has culminated in the Allergic Rhinitis in Asthma (ARIA), International Primary Care Airways Group (IPAG), and International Primary Care Respiratory Group (IPCRG) guidelines, which propose a 'one-airway' approach that emphasizes the importance of evaluating patients with one disease for the other, and adopting a combined treatment of both upper and lower airways¹⁰⁻¹². However, despite such recommendations, there is some indication that AR is neither routinely diagnosed nor treated in patients with concomitant asthma^{13,14}. There is thus a need to further document and understand the extent of diagnosis and treatment of these disorders after these recommendations were published, so that healthcare providers can follow the international recommendations in the care of their patients and propose optimal therapeutic regimens.

This study of individuals participating in an annual cross-sectional survey in three European countries was undertaken to determine the proportion reporting an asthma diagnosis who also reported AR and, of these, the proportion of patients treated for AR. A secondary objective was to assess the association between and clinical characteristics, healthcare resource utilization and quality of life (QoL) status and treatment status for AR.

Methods

Data were obtained from the 2004 results of the National Health and Wellness Survey (NHWS), a self-administered, web-based survey of consumer healthcare attitudes and behaviors from nationally representative, stratified, random samples of noninstitutionalized adults (≥ 18 years old) in the United States and five European countries¹⁵. The NHWS, conducted annually since 1998, covers a range of health-related topics, including personal histories of illness, resource use, symptom severity, and treatment choices. NHWS participants in 2004 were drawn from an Internet panel maintained by Harris Interactive¹⁶.

Sample

The sample used in this study was derived from the 26,468 participants in the 2004 NHWS from three European countries: Germany, France, and the United Kingdom (UK). Patients were drawn from the database if they reported all of the following: (1) experiencing asthma in the prior 12 months, (2) a physician diagnosis of asthma, and (3) ever

experiencing 'nasal allergies/hay fever' (physician diagnosed or self-reported symptoms).

Study measures

Asthma and AR severity and medication use were then assessed from the patient replies on the questionnaire. There were four possible answers to the question, 'How severe is your asthma?': mild intermittent, mild persistent, moderate persistent, and severe persistent. There were three possible answers to the question, 'How severe are your nasal allergies?': mild, moderate, and severe. Questions about asthma treatment queried survey participants regarding the use of 'steroids,' 'prescription medications,' (specific brands included), and 'over-the-counter' (OTC) and 'herbal products.' Questions about AR treatment queried survey participants regarding the use of 'prescription medications,' (specific brands included), and 'over-the-counter (e.g., antihistamine, vitamin C)' and 'herbal products.' Questions about allergen avoidance were not included in the survey.

Quality of life (QoL) over the previous 4 weeks was evaluated using the Medical Outcomes Study Short-Form Health Survey (SF-8)¹⁷.

Respondents were asked to report the number of emergency room visits, days hospitalized, and physician visits they had experienced in the prior 6 months.

Statistical analysis

The relationship between AR treatment (treated vs. untreated) and QoL, as well as AR treatment and resource use were evaluated at the bivariate level using the *t*-test to compare mean scores and the χ^2 test to compare categorical data. Linear regression analyses were used to study the impact of treatment on QoL and resource utilization, controlling for demographic (age and sex) and asthma and AR characteristics (severity of asthma and AR, seasonality of asthma and AR attacks, frequency of asthma and AR attacks). Regression models were analyzed for the following five dependent variables: SF-8 physical component summary score, SF-8 mental component summary score, number of emergency room visits, days hospitalized, and visits to physicians. All statistical tests were two-tailed at an alpha level of 0.05 and conducted using Stata software, version SE 7¹⁸.

Results

Of the 26,468 survey participants from Germany, France, and the UK, 1895 (7%) reported experiencing asthma in the previous 12 months and had been

diagnosed with asthma. Of these, 1139 patients (60%) also reported ever experiencing AR (physician diagnosed or self-reported symptoms) and were included in the study analyses. These patients with asthma and AR reported the severity of their asthma as mild intermittent (576 [51%]); or mild (227 [20%]), moderate (267 [23%]), or severe (62 [5%]) persistent (7 missing responses). The severity of nasal allergies was reported by 444 (39%) as mild, by 496 (44%) as moderate, and by 189 (17%) as severe (10 missing responses).

Eighteen percent ($n = 203$) of the patients reporting both asthma and AR did not have a physician diagnosis of AR. As depicted in Figure 1, more than half of these 203 patients (58%) used no treatment for AR, while 42% used OTC medication for self-treatment of AR.

Among the 936 patients reporting a physician diagnosis of AR, 50% had received AR prescriptions, 21% pursued OTC self-treatment, and 28% remained untreated. Overall, one third of patients (34%) with asthma and either diagnosed or self-reported AR were not treated for their AR (Figure 1).

The demographic characteristics of patients are listed by AR treatment status in Table 1. Although a majority of patients were treated for AR, women were more likely to be treated for AR than men; and patients from the UK were more likely to be treated for AR than patients from France or Germany.

Patients who were treated for AR had on average experienced a shorter history of asthma than patients who remained untreated for AR (Table 2). The patients reporting severe AR were more likely to be

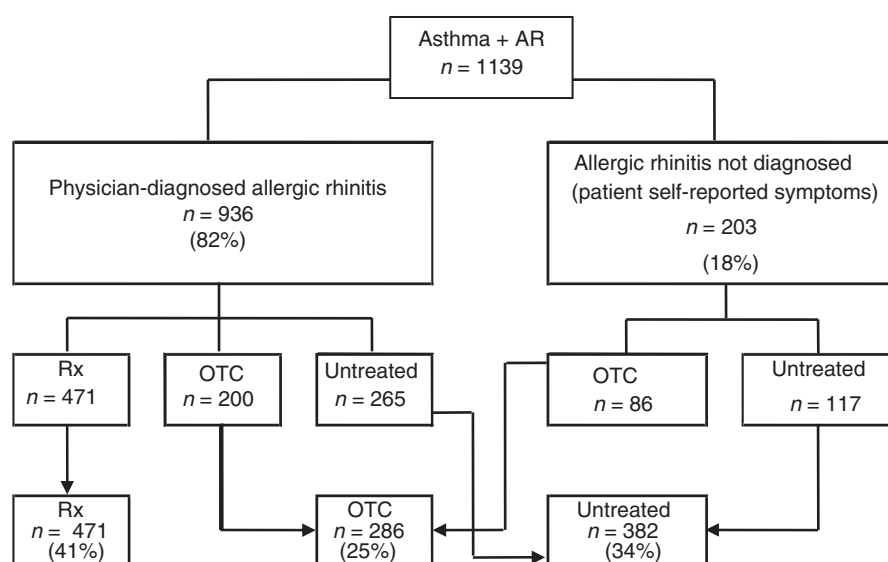


Figure 1. Diagnosis and treatment of allergic rhinitis in patients with asthma. AR = allergic rhinitis; OTC = over-the-counter medication; Rx = prescription medication

Table 1. Demographic characteristics by allergic rhinitis (AR) treatment status

	Patients treated for AR	Patients not treated for AR	<i>p</i> value
Patients, <i>n</i> (%)	757 (66.5%)	382 (33.5%)	–
Age, mean (SD)	40.2 (14.9)	40.5 (14.9)	0.771
Sex			
Female, <i>n</i> (%)	529 (69.1%)	237 (30.9%)	0.008
Male, <i>n</i> (%)	228 (61.1%)	145 (38.9%)	
Smoking status			
Smoker, <i>n</i> (%)	224 (66.5%)	114 (33.5%)	0.930
Nonsmoker, <i>n</i> (%)	533 (66.5%)	268 (33.5%)	
Country			
France, <i>n</i> (%)	221 (53.5%)	191 (46.5%)	<0.001
UK, <i>n</i> (%)	362 (76.0%)	115 (24.0%)	
Germany, <i>n</i> (%)	174 (69.5%)	76 (30.5%)	

AR = asthma; UK = United Kingdom

Table 2. Clinical characteristics by allergic rhinitis (AR) treatment status

	Patients treated for AR	Patients not treated for AR	<i>p</i> value
Patients, <i>n</i> (%)	757 (66.5%)	382 (33.5%)	–
Years with asthma, mean (SD)	16.0 (13.3)	18.0 (14.1)	0.024
Asthma severity			0.117
Mild intermittent, <i>n</i> (%)	381 (66.1%)	195 (33.9%)	
Mild persistent, <i>n</i> (%)	139 (61.2%)	88 (38.8%)	
Moderate persistent, <i>n</i> (%)	191 (71.5%)	76 (28.5%)	
Severe persistent, <i>n</i> (%)	41 (66.1%)	21 (33.9%)	
Years with AR, mean (SD)	17.4 (12.0)	16.3 (12.6)	0.236
Severity of allergic rhinitis			<0.001
Mild, <i>n</i> (%)	236 (53.2%)	208 (46.8%)	
Moderate, <i>n</i> (%)	363 (73.2%)	133 (26.8%)	
Severe, <i>n</i> (%)	156 (82.5%)	33 (17.5%)	

AR = allergic rhinitis

Table 3. Quality of life during the prior 4 weeks, and healthcare resource use during the prior 6 months, by AR treatment status

	Treated for AR (<i>n</i> = 757)	Not treated for AR (<i>n</i> = 382)	Mean difference* (95% CI)
SF-8 mental component			
Score, mean (SD)	44.84 (11.80)	45.54 (11.59)	0.49 (–1.02 to 2.00)
SF-8 physical component			
Score, mean (SD)	45.03 (11.57)	45.79 (10.61)	0.24 (–1.12 to 1.60)
Physician visits			
Events, mean (SD)	8.63 (10.40)	7.79 (11.03)	–0.45 (–1.83 to 0.94)
Emergency room visits			
Events, mean (SD)	0.25 (0.72)	0.25 (0.91)	–0.04 (–0.15 to 0.06)
Hospitalizations			
Days, mean (SD)	0.88 (3.91)	1.14 (8.31)	–0.46 (–1.23 to 0.31)

*Multivariate mean difference based on linear regression analyses controlling for demographic characteristics (age and sex) and asthma and AR characteristics (severity of asthma and AR, seasonality of asthma and AR attacks, frequency of asthma and AR attacks)

AR = allergic rhinitis; CI = confidence interval; SF-8 = Short-Form Health Survey quality-of-life questionnaire

treated than patients reporting mild or moderate AR, although 33 (18%) reporting severe AR were not treated for AR.

Multi-variable logistic regression analyses indicated that there were no significant differences in QoL over the prior 4 weeks seen between patients treated and those not treated for AR: the mean difference in mental component score was 0.49 (95% CI, –1.02 to 2.00) and the mean difference in physical component score was 0.24 (95% CI, –1.12 to 1.60; a higher score indicates worse QoL); nor were there significant differences between these two patient groups in healthcare resource use over the prior 6 months (Table 3).

Discussion

We have found that a large percentage of patients with AR and asthma were not diagnosed or not treated for AR despite reporting symptoms of AR in Germany, France, and the UK. Twenty-eight percent of patients with diagnosed AR and 58% of patients with self-reported AR remained untreated for AR; in total, 34% of patients with asthma and AR were not receiving treatment for AR.

Our results are consistent with those from other studies. Nolte *et al.*¹³ reported that AR was undiagnosed in 32% of adolescent and adult patients with concomitant asthma; 83% with moderate to severe

rhinitis were undertreated. In a pediatric study of patients with both disorders, just 24% had a diagnosis of AR, although 58% of patients required medications for AR within the last year, and 69% had findings consistent with AR¹⁴. The slight differences in diagnosis rate were most likely to be due to different population, data collection approaches, study time period. This study also documented the treatment rate of AR among asthma patients for the first time.

Why did AR remain undiagnosed for so many patients with asthma in our study? Allergic rhinitis presents several challenges to the physician treating asthma. Standardized diagnostic criteria for AR are not readily available, and some physicians may consider AR symptoms to be less serious than asthma symptoms or to be manifestations of a viral source, such as that triggered by the common cold. Additionally, only recently has there been awareness of the nasobronchial inflammatory link between the two disorders^{19–22}, underscoring the fact that traditional medical education has not emphasized the link between the upper and lower airways. Furthermore, patients seeing their doctor for asthma may fail to point out their allergy symptoms because of their presumption that such symptoms are a manifestation of asthma and hence not worthy of separate mention. Although not studied here, age at diagnosis of asthma may also be a factor²³.

Despite not having a physician diagnosis of AR, 42% of patients with asthma and self-reported AR symptoms in this study sought OTC medication for their allergy symptoms. What remains unclear, however, is why more than a quarter of patients who had been diagnosed for AR by their physician failed to treat their symptoms. Patient education which emphasizes allergen avoidance over pharmaceutical management of the condition may be one reason. Alternatively, patients may believe that their asthma medication was sufficient for treating both conditions, or that it was too burdensome to take separate medications for the two conditions. Finally, AR symptoms may not be bothersome enough for some patients to cause them to seek additional treatment. We noticed that a higher proportion of patients with severe or moderate AR Received treatments compared to patients with less severe AR; however, there were still 17.5%–26.8% of patients with severe or moderately severe AR did not get treatment.

Several limitations are associated with this study. First, patient-reported data are often incomplete, and survey instruments are not routinely tailored to specific asthma populations with concomitant AR. Second, there may be bias in a self-report survey. For example, in this survey, the asthma severity level of the

participants is self-reported. We have no way in which to verify the severity level. Third, the study was not powered to examine differences in quality of life or resource use. There were differences in the point estimates for these outcomes for treated vs. untreated patients and it's likely that with a larger sample size the precision of our results would have been improved. Further studies with larger sample sizes should be conducted to better understand the impact of untreated AR on outcomes relevant to patients. Fourth, the healthcare resource utilizations were not AR or asthma specific, which could be improved if disease-specific resources utilizations data were collected accurately.

Despite the availability of global management guidelines that encourage the evaluation and treatment of AR among patients with asthma^{10–12}, the frequency of diagnosis and treatment of AR remains insufficient compared to guideline, thus identifying an important clinical opportunity to improve asthma care. Increased effort must be expended to educate physicians so that they remain vigilant to the possible presence of AR when asthma is diagnosed, and vice versa. Moreover, physicians as well as patients must be made aware of the risks posed by AR to substantially exacerbate asthma and of the need to evaluate treatment options for improving symptoms of both conditions when present concomitantly. Improved communication between the patient and physician is also essential. Patients with asthma need to talk to their doctor about AR symptoms and discuss treatment options for managing both conditions, while physicians must appreciate the burden posed by AR in patients with asthma, ask patients how AR affects their asthma, and convey to patients the inter-related nature of the two conditions and the importance of a therapeutic regimen that treats them at the same time.

Transparency

Declaration of funding

This study was supported by a research grant from Merck & Co., Inc., Whitehouse Station, NJ.

Declaration of financial/other relationships

V.S., B.M.A., L.R., T.F., and S.D.T. have disclosed that they are employees of Merck & Co.

All peer reviewers receive honoraria from CMRO for their review work. Peer Reviewer 1 and Peer Reviewer 2 have disclosed that they have no relevant financial relationships.

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