

# Epidemiology of allergic rhinitis caused by grass pollen or house-dust mites in Spain

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## ABSTRACT

**Background:** Although the prevalence of allergic rhinitis (AR) is increasing, relatively little is known about patient characteristics in Spain. The aim of this study was to investigate the clinical profile and therapeutic strategies in patients attending Spanish specialists for AR caused by grass pollen or house-dust mites (HDMs).

**Methods:** This was a multicenter cross-sectional epidemiological study of consecutive patients aged  $\geq 5$  years with confirmed diagnosis of AR caused by grass pollen or HDMs attending allergy specialists throughout Spain. Demographic and clinical data and information on treatment were collected.

**Results:** Data from 1043 patients were analyzed (524 with grass pollen allergy and 519 with HDM allergy; mean age, 27.1 years). Three-quarters had persistent AR as per the Allergic Rhinitis and Its Impact on Asthma (ARIA) definition, with disease duration of  $>2$  years in 94.3% of those with pollen allergy and 85.5% of those with HDM allergy. Approximately 38% had concurrent asthma. Over one-half of the patients were considered to have gotten worse since the first onset of symptoms. In total, 51.5% did not achieve good disease control with pharmacotherapy and 47.7% were treated with immunotherapy (52.2% of HDM allergic patients and 43.2% of grass pollen-allergic patients).

**Conclusion:** The duration of AR in patients attended for the first time by specialists is long and, in general, the disease does not improve over time and is often not well controlled with pharmacologic interventions. Less than one-half of patients receive allergen-specific immunotherapy that is more often prescribed in HDM allergy.

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The prevalence of allergic rhinitis (AR) in the developed world is thought to be increasing,<sup>1,2</sup> although the reasons for this increase are still the subject of debate. According to a European population-based study of AR, the prevalence of clinically confirmable AR in Spain is 21.5%.<sup>3</sup> In a study conducted in the United States, the prevalence of self-reported rhinitis symptoms was 30.2%.<sup>4</sup> Some studies point to the high disease burden,<sup>5,6</sup> and this will presumably increase further as AR becomes more prevalent. Attempts have also been made to quantify the economic impact of this illness.<sup>7</sup>

Often, AR is associated with the presence of other diseases of allergic origin such as atopic dermatitis and asthma.<sup>8</sup> In particular, the association between AR and asthma is of concern and, nowadays, it is considered that AR and asthma have common physiopathological mechanisms.<sup>9</sup> Indeed, effective treatment of one may help improve symptoms in the other.<sup>10,11</sup>

Because of the importance of AR as a disease associated with high burden, enhanced by other frequently related allergic diseases, such as asthma, there is a growing need to better define the clinical profile of patients who suffer from this condition. This was recognized in the 2008 update of the Allergic Rhinitis and Its Impact on Asthma (ARIA) workshop,<sup>12</sup> conducted under the auspices of the World Health Organization. Earlier workshops had introduced the concept of “persistent” (symptoms for  $>4$  days/week and for  $>4$  consecutive weeks) or

“intermittent” (symptoms for  $<4$  days/week or for  $<4$  weeks) to further refine characterization of the disease<sup>13</sup> and it was suggested that patients with the persistent form of the disease should be monitored particularly closely for signs of asthma. In the epidemiological study by Bauchau and Durham,<sup>3</sup> 40% of previously undiagnosed AR patients had the persistent form according to the ARIA classification. In the case of patients with an established diagnosis, 80% had the persistent form.

Although the prevalence and burden of AR is increasing, there are relatively few recent epidemiological data on this disease in the Spanish population. The aim of this study was therefore to investigate the clinical profile and therapeutic strategies in patients attending Spanish specialists for AR caused by grass pollen or house-dust mites (HDMs).

## MATERIALS AND METHODS

In this observational study conducted in normal clinical practice, allergy specialists were randomly selected from public and private clinics from all regions of Spain and asked to participate in the study. Selection was weighted with a view to reflect the population of each province with the aim of obtaining a balanced sample taken from throughout Spain. Given that patients were analyzed by type of sensitization (grass pollen or HDMs), selection was also weighted according to prior prevalence data for sensitization to the two allergens to ensure representative samples.<sup>14</sup>

The specialists who agreed to participate were instructed to recruit the first four patients who met the following inclusion criteria:  $\geq 5$  years of age, first consultation (with the investigator), suspected diagnosis of AR (with or without asthma) due to grass pollen or HDMs based on clinical presentation and prior history, and allergic sensitization confirmed by positive skin-prick test and/or *Der-matophagoides* or grass pollen-specific immunoglobulin (Ig) E  $>0.70$  kU/L. Patients were excluded if they were participating in another epidemiological study or clinical trial.

Because this was an observational study, it did not in any way interfere with the normal care that the patients received. All patients (or the parents/legal guardian in the case of pediatric patients) signed a written informed consent to allow their data to be used in the analysis. Confidentiality of the patients' data was maintained at all times. The study

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Table 1 Sociodemographic data for the overall study population according to type of allergy

|                   | Overall<br>(n = 1043)   | Grass Pollen<br>(n = 524) | House-Dust Mites<br>(n = 519) | p Value* |
|-------------------|-------------------------|---------------------------|-------------------------------|----------|
| Age, yr#          | n = 1034<br>27.1 (5–75) | n = 519<br>29.3 (5–71)    | n = 515<br>24.8 (5–75)        | <0.001§  |
| BMI               | n = 1018<br>23.4 (4.5)  | n = 511<br>23.7 (4.2)     | n = 507<br>23.2 (4.7)         | 0.039¶   |
| Sex               | n = 1015                | n = 512                   | n = 503                       |          |
| Male              | 497 (49%)               | 265 (52%)                 | 232 (46%)                     |          |
| Female            | 518 (51%)               | 247 (48%)                 | 271 (54%)                     | 0.073¶   |
| Type of residence | n = 1036                | n = 520                   | n = 516                       |          |
| Rural             | 235 (23%)               | 114 (28%)                 | 91 (18%)                      |          |
| Urban             | 801 (77%)               | 376 (72%)                 | 425 (82%)                     | <0.001¶  |

\*Comparison of grass pollen group vs house-dust mite group.

#Mean (range).

§Student's *t*-test.

¶ $\chi^2$ -test.

BMI = Body mass index.

Table 2 Personal history of the main other allergic diseases (reported in &gt;3% of overall population)

|                                    | Overall<br>(n = 1043) | Grass Pollen<br>(n = 524) | House Dust Mites<br>(n = 519) | p Value* |
|------------------------------------|-----------------------|---------------------------|-------------------------------|----------|
| Conjunctivitis                     | 565 (54%)             | 338 (65%)                 | 227 (44%)                     | <0.001   |
| Asthma                             | 366 (35%)             | 161 (31%)                 | 205 (39%)                     | 0.006    |
| Allergy to animal dander (cat/dog) | 95 (9%)               | 46 (9%)                   | 49 (9%)                       | 0.823    |
| Atopic dermatitis                  | 78 (7%)               | 25 (5%)                   | 53 (10%)                      | 0.001    |
| Food allergy                       | 61 (6%)               | 34 (6%)                   | 27 (5%)                       | 0.313    |
| Drug allergy                       | 39 (4%)               | 25 (5%)                   | 14 (3%)                       | 0.062    |
| Acute recurrent urticaria          | 34 (3%)               | 15 (3%)                   | 19 (4%)                       | 0.762    |

\*Comparison of grass pollen group vs house-dust mite group,  $\chi^2$ -test.

was evaluated and approved by the reference Ethics Committee (Hospital Clinic, Barcelona, Spain).

## Study Variables

After obtaining written informed consent from the patients, the following data were collected during a single study visit: sociodemographic and general clinical characteristics of the patients, concomitant treatments and diseases, rhinitis symptoms, diagnostic procedures, prior therapies for rhinitis, and therapies prescribed for rhinitis during the study visit. In addition, the impact of the disease on overall state of health was assessed using a 10-cm visual analog scale (0 = no impact and 10 = maximum impact). Data were collected using a standard case report form and, once validated, were subsequently entered into a database for statistical processing. Asthma was classified using the Global Initiative for Asthma (GINA) definitions.<sup>15</sup> The investigator assigned the frequency and severity of symptoms according to the classification system of the ARIA document.<sup>12</sup>

## Statistical Analysis

All of the study data were presented using descriptive statistics (including measures of central tendency and dispersion for quantitative variables and absolute numbers and percentages for qualitative ones, with the corresponding 95% confidence interval [CI] where appropriate). In addition, patients were divided into two groups—those with AR due to grass pollen and those with disease due to HDMs (when sensitization to both grass pollen and HDMs occurred in the same patient, investigators assessed the clinical relevance of the sensitization and assigned patients to one group or another, according to the seasonal nature of the symptoms, specific IgE measure-

ments, and, occasionally, provocation tests). Group comparisons were made using the  $\chi^2$ -test and Student's *t*-test, as appropriate. Statistical significance was set at  $p < 0.05$ .

## RESULTS

Of the 473 specialists selected, 297 agreed to participate. These investigators provided data for 1168 patients, although after validation of the data, 1043 (recruited by 290 investigators between November 2007 and May 2008) had assessable data (524 with grass pollen allergy and 519 with HDM allergy). Seventy percent of the patients were recruited from public clinics.

## Patient Characteristics

The sociodemographic characteristics of these patients (for the overall population and by type of allergy) are presented in Table 1. Men and women were evenly represented across all groups. The mean age of the sample was 27.1 years. More patients with grass pollen allergy had been referred by a family physician (58%) compared with patients with HDM allergy (48%). Likewise, more patients with grass pollen allergy considered their current state of overall health to be very good or good (439/518 [84.7%]) compared with those with HDM allergy (373/516 [72.2%]). The differences in reported state of health were statistically significant ( $p < 0.001$ ;  $\chi^2$ -test).

Table 2 summarizes the personal history of allergic disease. Approximately 35% of the patients overall had self-reported concurrent asthma, with a greater proportion in the HDM group compared with the grass pollen group (39% versus 31%;  $p = 0.006$ ;  $\chi^2$ -test). Significant differences in the proportions of patients with atopic dermatitis were

Table 3 Current characteristics of allergic rhinitis

|                                           | Overall<br>(n = 1043) | Grass Pollen<br>(n = 524) | House-Dust Mites<br>(n = 519) | p Value* |
|-------------------------------------------|-----------------------|---------------------------|-------------------------------|----------|
| Time since onset of symptoms, yr#         | n = 945<br>8.1 (7.8)  | n = 470<br>8.7 (7.9)      | n = 475<br>7.6 (7.6)          | <0.001   |
| Presence of symptoms                      | n = 1043              | n = 524                   | n = 519                       |          |
| Sneezing                                  | 940 (90%)             | 484 (92%)                 | 456 (88%)                     | 0.015    |
| Runny nose                                | 949 (91%)             | 478 (91%)                 | 471 (91%)                     | 0.791    |
| Itchy nose                                | 889 (85%)             | 462 (88%)                 | 427 (82%)                     | 0.007    |
| Blocked nose                              | 844 (81%)             | 424 (81%)                 | 420 (81%)                     | 0.997    |
| Other symptoms§                           | 364 (35%)             | 211 (40%)                 | 153 (30%)                     | <0.001   |
| Change in symptoms since first appearance | n = 1030              | n = 516                   | n = 514                       | 0.107    |
| Much better                               | 20 (2%)               | 12 (2%)                   | 8 (2%)                        |          |
| Better                                    | 149 (15%)             | 83 (16%)                  | 66 (13%)                      |          |
| No change                                 | 323 (31%)             | 144 (28%)                 | 179 (35%)                     |          |
| Worse                                     | 466 (45%)             | 243 (47%)                 | 223 (43%)                     |          |
| Much worse                                | 72 (7%)               | 34 (7%)                   | 38 (7%)                       |          |
| ARIA classification¶                      |                       |                           |                               |          |
| According to frequency of symptoms        | n = 1026              | n = 514                   | n = 512                       | 0.026    |
| Intermittent                              | 271 (26%)             | 120 (23%)                 | 151 (30%)                     |          |
| Persistent                                | 755 (74%)             | 394 (77%)                 | 361 (70%)                     |          |
| Severity of symptoms                      | n = 1035              | n = 524                   | n = 511                       | 0.175    |
| Mild                                      | 135 (13%)             | 61 (12%)                  | 74 (15%)                      |          |
| Moderate/severe                           | 900 (87%)             | 463 (88%)                 | 437 (85%)                     |          |
| Frequency and severity of symptoms)       | n = 1016              | n = 511                   | n = 505                       | 0.082    |
| Mild intermittent                         | 64 (6%)               | 26 (5%)                   | 38 (8%)                       |          |
| Mild persistent                           | 60 (6%)               | 28 (6%)                   | 32 (6%)                       |          |
| Moderate/severe intermittent              | 203 (20%)             | 92 (18%)                  | 111 (22%)                     |          |
| Moderate/severe persistent                | 689 (68%)             | 365 (71%)                 | 324 (64%)                     |          |

\*Comparison of grass pollen group vs house-dust mite group,  $\chi^2$ -test.

#Years (SD).

§Mainly ocular symptoms and itchy throat and/or mouth.

¶See Ref. 12 and text for details of the ARIA classification.

ARIA = Allergic Rhinitis and Its Impact on Asthma.

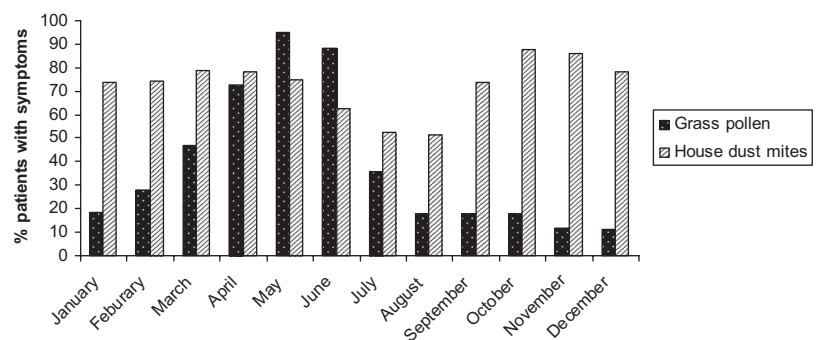


Figure 1. Distribution of patients with symptoms throughout the year.

also reported (10% in the HDM group and 5% in the grass pollen group;  $p = 0.001$ ;  $\chi^2$ -test). Conversely, conjunctivitis was more frequent in the grass pollen patients.

### Rhinitis Characteristics

The characteristics of rhinitis are summarized in Table 3. On average, patients with grass pollen rhinitis had the disease longer (8.7 years versus 7.6 years;  $p < 0.001$ ). The percentage of patients with disease duration  $>2$  years was 94.3% for pollen allergy and 85.5% for HDM allergy. Four main symptoms (sneezing, runny nose, itchy nose, and blocked nose) were reported in  $>80\%$  of the patients in both groups. Sneezing and itchy nose were significantly more prevalent in the grass pollen group. Overall, 52% of patients considered that their disease got worse or much worse since the first onset of

symptoms. The symptoms of patients in the grass pollen group showed a marked seasonal variation, with a peak at  $>90\%$  in May and a minimum in November/December at  $\sim 10\%$  (Fig. 1). In contrast, the symptoms of those in the HDM group showed a minimum at around 50% in July and August but were  $>70\%$  for most of the year. According to the ARIA classification, 74% had persistent disease (77% in the grass pollen group and 70% in the HDM group;  $p = 0.026$ ; Table 3). Moderate/severe symptoms were reported in 87% of the overall sample (with no differences between groups), and most individuals with moderate/severe symptoms had persistent symptoms.

Table 4 Allergen sensitization detected by skin prick-test\*

|                         | Overall<br>(n = 1043) | Grass pollen<br>(n = 524) | House dust mites<br>(n = 519) | p Value# |
|-------------------------|-----------------------|---------------------------|-------------------------------|----------|
| Pollens                 |                       |                           |                               |          |
| Grasses                 | 624 (60%)             | 524 (100%)                | 100 (19%)                     | <0.001   |
| Olive tree              | 412 (40%)             | 299 (57%)                 | 113 (22%)                     | <0.001   |
| Plantago                | 166 (16%)             | 140 (27%)                 | 26 (5%)                       | <0.001   |
| Cypress                 | 154 (15%)             | 136 (26%)                 | 18 (3%)                       | <0.001   |
| Plane tree              | 157 (15%)             | 134 (26%)                 | 23 (4%)                       | <0.001   |
| Salsola                 | 96 (9%)               | 86 (16%)                  | 10 (2%)                       | <0.001   |
| Artemisia               | 102 (10%)             | 79 (15%)                  | 23 (4%)                       | <0.001   |
| Parietaria              | 76 (7%)               | 58 (11%)                  | 18 (3%)                       | <0.001   |
| Birch                   | 20 (2%)               | 13 (2%)                   | 7 (1%)                        | 0.183    |
| Mites                   |                       |                           |                               |          |
| <i>Dermatophagoides</i> | 634 (61%)             | 115 (22%)                 | 519 (100%)                    | <0.001   |
| <i>Lepidoglyphus</i>    | 169 (16%)             | 34 (6%)                   | 135 (26%)                     | <0.001   |
| <i>Tyrophagus</i>       | 108 (10%)             | 24 (5%)                   | 84 (16%)                      | <0.001   |
| <i>Acarus</i>           | 59 (6%)               | 9 (2%)                    | 50 (10%)                      | <0.001   |
| <i>Blomia</i>           | 48 (5%)               | 5 (1%)                    | 43 (8%)                       | <0.001   |
| Molds                   |                       |                           |                               |          |
| <i>Alternaria</i>       | 56 (5%)               | 29 (6%)                   | 27 (5%)                       | 0.812    |
| Animals                 |                       |                           |                               |          |
| Dog                     | 244 (23%)             | 110 (21%)                 | 134 (26%)                     | 0.066    |
| Cat                     | 211 (20%)             | 98 (19%)                  | 113 (22%)                     | 0.217    |
| Cockroach               | 21 (2%)               | 9 (2%)                    | 12 (2%)                       | 0.494    |

\*When patients were sensitized to both pollens and house-dust mites, assignment to the grass pollen or house-dust mite groups was performed according to the investigators' clinical judgment (see text).

#Comparison of grass pollen group vs house-dust mite group,  $\chi^2$ -test.

Table 5 Severity and control of asthma according to the Global Initiative for Asthma criteria\*

|                               | Overall<br>(n = 1043) | Grass pollen<br>(n = 524) | House dust mites<br>(n = 519) | p Value# |
|-------------------------------|-----------------------|---------------------------|-------------------------------|----------|
| Asthma diagnosis              | 393 (38%)             | 184 (35%)                 | 209 (40%)                     | 0.086    |
| Severity of asthma            | n = 390               | n = 184                   | n = 206                       | 0.156    |
| Grade 1 (intermittent)        | 230 (59%)             | 112 (61%)                 | 118 (57%)                     |          |
| Grade 2 (mild persistent)     | 101 (26%)             | 40 (22%)                  | 61 (30%)                      |          |
| Grade 3 (moderate persistent) | 59 (15%)              | 32 (17%)                  | 27 (13%)                      |          |
| Grade 4 (severe persistent)   | 0                     | 0                         | 0                             |          |
| Asthma control                | n = 315               | n = 140                   | n = 175                       | 0.572    |
| Controlled                    | 217 (69%)             | 96 (69%)                  | 121 (69%)                     |          |
| Partially controlled          | 74 (24%)              | 31 (22%)                  | 43 (25%)                      |          |
| Uncontrolled                  | 24 (8%)               | 13 (9%)                   | 11 (6%)                       |          |

\*See ref. 15.

#Comparison of grass pollen group vs house-dust mite group,  $\chi^2$ -test.

## Diagnostic Procedures

A skin-prick test was done in all patients and a specific IgE test was requested in 41% of the patients (185/524 patients [35.3%] in the grass pollen group and 254/519 [48.9%] in the HDM group;  $p < 0.001$ ;  $\chi^2$ -test). As shown in Table 4, ~22% of patients considered to have AR induced by grass pollen were also sensitized to *Dermatophagoides*. Likewise, ~19% of those with rhinitis caused by *Dermatophagoides* were also sensitized to grass pollen. With the exception of birch, those with allergy to grass pollen were significantly more likely to have sensitization to other pollens, in particular, olive tree pollen (57% versus 22%;  $p < 0.001$ ;  $\chi^2$ -test), than those with allergy to HDMs. In the case of those with HDM allergy, they were more likely to be allergic to other mites (*Tyrophagus*, *Lepidoglyphus*, *Acarus*, and *Blomia*).

## Asthma Assessment

Overall, 393 patients (184 [35%] in the grass pollen group and 209 [40%] in the HDM group;  $p = 0.086$ ) were diagnosed as having asthma during the consultation. The characteristics of asthma according to the GINA criteria<sup>13</sup> are presented in Table 5.

## Treatment

In total, 860/1023 patients (84.1%) had received prior treatment for AR. Analysis by groups showed that significantly more patients with grass pollen rhinitis had received treatment (449/513 [87.5%]) than those with HDM rhinitis (411/510) [80.5%];  $p = 0.002$ ;  $\chi^2$ -test). The most frequent type of prior treatment was pharmacologic (83.2% of the patients overall; 87.1% in the grass pollen group and 79.2% in the HDM group;  $p < 0.001$ ). For the most part, good control of the disease

was not achieved with prior pharmacologic treatment (very good control, 9.1%; good control, 36.7%; partial control, 43.4%; poor control, 8.7%; very poor control, 2.2%). At the study visit, some sort of treatment was prescribed to all patients, the most common overall being pharmacologic treatment, mainly oral antihistamines and nasal corticosteroids, recommended to 523/523 patients (100%) with grass pollen allergy (oral antihistamines in 97.7%, nasal corticosteroids in 82.6%, and nasal antihistamines in 13%) and 510/519 patients (98.3%) with HDM allergy (oral antihistamines in 91.9%, nasal corticosteroids in 77.8%, and nasal antihistamines in 4.9% [ $p = 0.004$ ], followed by allergen avoidance measures (478/523 [91.4%] versus 514/519 [99.0%], respectively [ $p < 0.001$ ]). Allergen-specific immunotherapy was prescribed to 48% of patients (administered subcutaneously in 61.6% and sublingually in 38.4%) and was given significantly more often in those with HDM allergy (271/519 [52.2%]) than in those with grass pollen allergy (226/523 [43.2%];  $p = 0.004$ ).

## DISCUSSION

In this study of >1000 patients attended by specialists throughout Spain, three-quarters had persistent AR as per the ARIA definition, and ~40% had concurrent asthma. Moreover, over one-half of the patients considered their disease to have worsened since the first onset of symptoms and did not achieve good disease control with pharmacotherapy. Nearly one-half were treated with immunotherapy (significantly more with HDM allergy compared with grass pollen allergy).

The persistent/intermittent classification of the ARIA workshops recognized that the distinction of perennial versus seasonal was not always useful<sup>16</sup> and that many patients may be sensitized to more than one allergen.<sup>3,17,18</sup> In our study, 22% of patients with grass pollen allergy were sensitized to *Dermatophagoides* and 19 and 21% were sensitized to cat and dog dander, respectively, and 19% of those with HDM allergy were sensitized to grass pollens. This is in line with another study that investigated AR according to whether sensitization was to pollens only, perennial allergens only, or both.<sup>19</sup> Moreover, in the breakdown of patients with grass pollen allergy by month, >10% still have symptoms in the winter months (Fig. 1), although it is not clear whether this is mainly because of sensitization to indoor allergens or because of sensitization to perennial outdoor allergens. Our findings thus support the conclusions of groups that affirm that the terms perennial and seasonal AR can not be used interchangeably with persistent and intermittent.<sup>13,20</sup> We also note that it has been suggested that HDM allergens may have lower concentrations in the summer in Mediterranean areas<sup>21</sup> and a dip is, in fact, observed in the months of August among patients with HDM allergy in our study (Fig. 1).

The proportion of patients (74%) with persistent disease in our study, conducted in a specialized setting, is considerably more than the 29% of those with confirmed diagnosis in the study by Bauchau and Durham,<sup>22</sup> conducted in the general population. The ARIA document also contemplates classification of rhinitis into mild and moderate/severe,<sup>13</sup> with an additional modification to differentiate between moderate and severe rhinitis.<sup>23</sup> In a French study of patients consulting family physicians, Bousquet *et al.*<sup>24</sup> reported 11% with mild intermittent rhinitis, 8% with mild persistent rhinitis, 35% with moderate/severe intermittent rhinitis, and 46% with moderate/severe persistent rhinitis. As would be expected in patients consulting specialists, our sample appeared to have more severe disease—68% had moderate/severe persistent disease. A somewhat surprising result is that there were more patients with grass pollen allergy who had persistent disease according to the ARIA classification. A possible explanation lies in the higher referral rates for patients with grass pollen allergy. Thus, family physicians may only make referrals when a certain disease severity is reached, thereby selecting proportionately more patients with grass pollen allergy and more severe (and persistent) disease.

Besides better reflecting clinical reality, an important reason for

introducing the persistent versus intermittent classification was as a means of identifying patients at greater risk of concomitant asthma.<sup>22</sup> An association between AR and asthma has long been recognized, although not all patients with AR have or will develop asthma.<sup>16</sup> Nevertheless, according to the ARIA recommendations, those patients with persistent rhinitis should be assessed for the possibility of asthma. In the present study, 38% of the patients had asthma and of those, 15% had grade 3 (persistent moderate) according to the GINA classification.<sup>15</sup> In the study by Bauchau and Durham,<sup>3</sup> 22% of the patients with clinical diagnosis of AR had self-reported asthma. The difference can presumably be explained by the greater severity of AR in our patients. Interestingly, the prevalence of diagnosed asthma was not significantly higher among patients sensitized primarily to HDMs than to grass pollen.

It is encouraging to note that the percentage of patients with self-reported asthma and asthma diagnosed according to the investigator were quite similar, suggesting that in patients attended in specialist care for AR, concurrent asthma had been effectively detected beforehand. The percentage of patients with uncontrolled asthma was low (8%), again suggesting that concurrent asthma in these patients is being treated effectively.

In our patients, the most common symptoms overall were sneezing and runny nose (90 and 91%, respectively), although itchy nose and blocked nose were also reported frequently (88 and 81%, respectively). These percentages are higher than those reported by Bauchau and Durham<sup>3</sup> for those patients with confirmed diagnosis (74% for sneezing, 63% for runny nose, 61% for blocked nose, and 55% for itchy nose). This is presumably a reflection of the greater severity of disease in patients referred to a specialist, particularly because AR is mainly detected and treated because patients are bothered by “visible” symptoms.

Because disease due to grass pollen was a little more severe than rhinitis caused by *Dermatophagoides*, according to the ARIA classification, it is interesting that, paradoxically, the perceived health status was worse for those with HDM allergy. A possible explanation for this is that the generally perennial and longer-lasting nature of the symptoms in the case of HDM allergy has a greater impact on perceived health, although other authors have reported that severity rather than duration is more important for determining quality of life.<sup>24</sup>

In the study by Bauchau and Durham,<sup>3</sup> the investigators considered that 85% of the patients with confirmed diagnosis should be receiving medication, whereas only 47% reported having used medication in the last 2 years. In a recent study by Navarro *et al.*<sup>25</sup> of Spanish patients attending allergology departments for the first time, 55% were diagnosed with AR and 77% had already received some kind of prior treatment in the previous year. In our study of patients attending specialist clinics, we found that 84% had received prior treatment for AR.

Good control of the disease with pharmacologic treatment was not achieved in more than one-half of our patients, most of whom had a disease duration of >2 years and, despite the available treatments, more than one-half of the patients in both groups considered that the disease had got worse or much worse since the onset of symptoms. Poor pharmacologic control is one of the suggested indications for allergen-specific immunotherapy,<sup>12</sup> which is also indicated in those patients who do not wish to take long-term pharmacotherapy or who do not tolerate it. Allergen-specific immunotherapy is the only treatment that, in addition to alleviating symptoms, is able to change the natural course of the disease.<sup>12</sup> Its efficacy has been shown both with subcutaneous<sup>26</sup> and sublingual administration,<sup>27</sup> although the latter route has a better safety profile and a lower risk of anaphylactic reactions.<sup>28</sup> Despite all of these facts, immunotherapy was only prescribed to 48% of patients. Our study can only detect patients who were prescribed immunotherapy at the study visit. Clearly, more patients may be prescribed immunotherapy at a later visit, so the figure of 48% most likely underestimates the percentage of patients who ultimately receive this treatment. Although the per-

centage of patients prescribed immunotherapy might seem high, >85% of patients had moderate/severe symptoms and other interventions and pharmacologic control had been, for the most part, poor. We can only speculate why immunotherapy was prescribed significantly more frequently for HDM allergy. It may be that the more seasonal nature of grass pollen allergy means that short-term symptomatic treatment is more acceptable than long-term treatment that would be required in the case of HDM allergy.

In summary, the patients included in the study had long-lasting moderate or severe rhinitis (90% with disease duration of  $\geq 2$  years), often accompanied by asthma under control. More than one-half considered that their disease had worsened since the first onset of symptoms and 54.3% of patients did not achieve good disease control with pharmacologic treatments. Although such patients are candidates for immunotherapy, which has been shown to be safe and effective in many clinical trials, less than one-half of the patients included in the study received allergen-specific immunotherapy.

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