

E. FRATTI¹, S. SCURATI², I. DELL'ALBANI¹, P. PUCCINELLI¹, C. INCORVAIA³, G. PASSALACQUA⁴

Evaluation of house dust mite allergy in real life: patients' characteristics and satisfaction with treatment

¹Stallergenes Italy, Milan, Italy

²Stallergenes France, Antony, France

³Allergy/Pulmonary Rehabilitation, ICP Hospital, Milan, Italy

⁴Allergy and Respiratory Diseases, IRCCS University of Genoa, Italy

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Corresponding author

Giovanni Passalacqua, MD
Allergy and Respiratory Diseases
Pad. Maragliano, Largo R. Benzi 10
16133 Genoa, Italy

Summary

Background. HDMs are a ubiquitous allergen source, with a very well defined biology, but their role in clinical settings and in everyday clinical practice is not well characterized. Aim of this cross-sectional, questionnaire-based study was to assess the clinical characteristics of HDM-related respiratory allergy in a large population of Italian patients. **Methods.** A structured questionnaire was sent to allergists randomly chosen among those of the Italian Federation of Immunology, Allergy and Clinical Immunology (IFIACI). They were asked to fill it with the clinical data of 10-12 consecutive patients referred for respiratory allergy, positive to HDM skin prick test. The questionnaire assessed type and severity of allergy, demographics, yearly distribution of symptoms, treatment, and satisfaction with the therapy. **Results.** 45 allergists collected data from 499 patients. Within the evaluated population, 42% had rhinitis only, 45% asthma + rhinitis and 13% asthma alone. Rhinitis was moderate/severe in 51% of patients. Asthma was intermittent in 36% of patients, mild in 37% and moderate in 27%. Conjunctivitis was the most frequent comorbidity (36%), followed by rhinosinusitis (16%), adenoid hypertrophy (6%) and polyposis (5%). Out of the population, 56.2% of patients were not at all or partially not satisfied of their treatment for rhinitis, whereas the percentage of dissatisfied patients was about 53% for asthma therapy. 34% patients (n = 170) were monosensitized to HDM. It is confirmed that patients have more symptoms during the fall-winter periods. **Conclusion.** Patients with HDM allergy have frequently moderate-severe rhinitis, and about 50% of them are not satisfied with their treatment.

Introduction

Sensitization to house dust mite (HDM) is probably the most frequent cause of IgE-mediated respiratory allergy all over the world (1,2). Indeed, the prevalence of sensitisation to HDM overcomes that of all other common inhalant allergens, with few exceptions, according to the geographical area (3). In addition, the IgE response to HDM allergens uniquely starts very early in life, and persists unchanged until adolescence and adulthood (4). HDM belongs to the *Arachnida* class, is ubiquitous under the altitude of 2000 m and proliferates better in humid and warm environments. The demonstration in asthmatic children of the beneficial

effects of sojourning over 2.000 m is part of the history of allergy (5). The allergen components of HDM have been well characterized and cloned (6). The major allergens are Group 1 proteins (Der p 1 and Der f 1) and Group 2 proteins (Der p 2 and Der f 2). These are proteases that can *per se* favour the Th2 response (7). Another important allergen component is tropomyosin (Der p 10), a pan-allergen that has some relevance in food-inhalant allergies (8). This type of allergy is usually characterized by persistent symptoms (previously referred to as a perennial disease), since HDM aerodispersed allergens are present around all the year, with a lower burden during summer months. The continuous

exposure to allergens maintains a chronic inflammation, which is responsible for mucosal hyperreactivity and for symptoms. In particular, in the nose, the continuous exposure and inflammation account for nasal obstruction, which is the most bothersome manifestation (9). In the case of an environmental allergen load insufficient to elicit symptoms, a sub-clinical inflammation (minimal persistent inflammation) can be detected (10). As a consequence of the wide diffusion of the allergenic source and of the clinical and immunological effects, allergy to mite represents a huge socio-economical and healthcare burden.

Despite the biology and allergenic characteristics of HDM being well known, there is still room to investigate its impact on the life of allergic patients, including the treatments used to manage the mite-induced disease. In particular, the patients' viewpoint on the effectiveness of guideline-based pharmacological treatment has been so far poorly investigated.

Thus, the aim of this cross-sectional study was to assess the clinical characteristics (including co-morbidities and severity of disease) of HDM-related respiratory allergy in a large population of Italian patients, using a questionnaire-based method.

Methods

Overall design

This is a questionnaire-based survey involving Italian allergists distributed over the entire territory. The allergists were randomly chosen, in equal proportion, from the three Italian societies of allergy and clinical immunology, which currently convene in the Italian Federation of Immunology, Allergy and Clinical Immunology (IF-ACI). The names of the allergists were selected from the member list of each Society. A structured questionnaire was e-mailed to each allergist, who had to fill it with the clinical data of 10-12 consecutive patients referred for respiratory allergy and who resulted positive to HDM skin prick test (SPT). Only patients suffering from respiratory allergy (asthma and/or rhinitis) were included. Each allergist used the same criteria for diagnosing rhinitis and asthma (11,12). SPTs were performed and read according to the recent European recommendations (13). A standard panel of allergens was used in addition to HDM, including: grass mix, *Cynodon dactylon*, *Parietaria*, birch, olive, ragweed, cypress, cat, dog, and *Alternaria*. Each physician notified the survey to his/her referral Ethical Committee. The personal data of the patients were kept strictly anonymous. The questionnaires were returned, by e-mail again, to a central organization (IBIS Informatica, Milan, Italy) that performed the data entry and the statistical analyses.

Questionnaire

The questionnaire was set up by a panel of experts from IFACI. For each physician, the essential demographic information

was obtained: age, sex, specialty, region of Italy (North, Centre, South). In addition it was asked to estimate when they more frequently experienced symptoms, and in what proportion of them was specific immunotherapy (SIT) prescribed. The patient's questionnaire, filled by the physician according to clinical history and diagnostic procedures, included:

- Region of residence (North, Centre, South of Italy)
- age range ($5 \leq$ years < 14 , $14 \leq$ years < 18 , ≥ 18 years)
- type of disease (rhinitis, asthma, both)
- severity of rhinitis (intermittent, persistent, mild, moderate/severe)
- severity of asthma (intermittent, mild persistent, moderate, severe)
- duration of symptoms (months/years)
- months of the year when symptoms are worse
- treatments for rhinitis (topical/systemic antihistamines, topical/oral/injected steroids, leukotriene modifiers, cromones, nose lavages)
- treatments for asthma (short/long acting bronchodilators, inhaled/oral/injected steroids, inhaled anticholinergics, leukotriene modifiers, theophylline, others)
- degree of satisfaction with treatments for asthma and/or and rhinitis (not satisfied at all, partially dissatisfied, partially satisfied, fully satisfied)
- presence of clinical symptoms following the ingestion of shrimps or snails
- additional positive SPTs (grass, *Parietaria*, birch, olive, ragweed, cypress, cat, dog, *Alternaria*, any other tested)
- comorbidities (conjunctivitis, rhinosinusitis, nasal polyps, adenoid hypertrophy, recurrent otitis).

Results

Forty-five allergists were involved in this survey (46% Northern Italy, 21% Central and 33% Southern Italy). The 45 specialists collected data from 499 patients, 48% adults, 30% children and 22% adolescents. Missing/unreported data varied, on average, from 0 to about 8% according to the questionnaire's items. The descriptive statistical analysis was done per each item only on entered data.

Within the evaluated population, 42% had rhinitis only, 45% asthma plus rhinitis and 13% asthma alone. Rhinitis was mild intermittent in 11%, moderate/severe intermittent in 15%, mild persistent in 38% and moderate/severe persistent in 36% of patients. Asthma was intermittent in 36% of patients, mild in 37% and moderate in 27% (**figure 1**). For rhinitis, oral antihistamines were prescribed in 76% of patients and topical steroids in 63%. Concerning asthma, inhaled steroids were used in 55% of patients, short acting beta2 agonists in 49%, long acting beta2 agonists in 34% and leukotriene modifiers in 41%. Conjunctivitis was the most frequent comorbidity, reported by

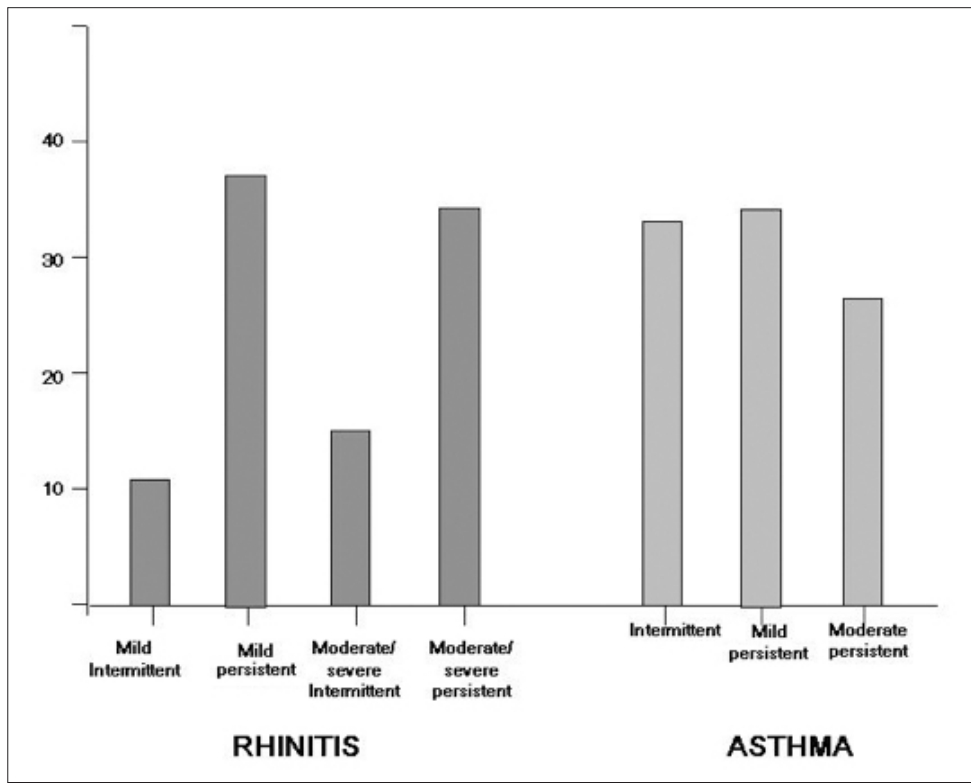


Figure 1 - Percentage distribution of the severity/duration of asthma (right) and rhinitis (left)

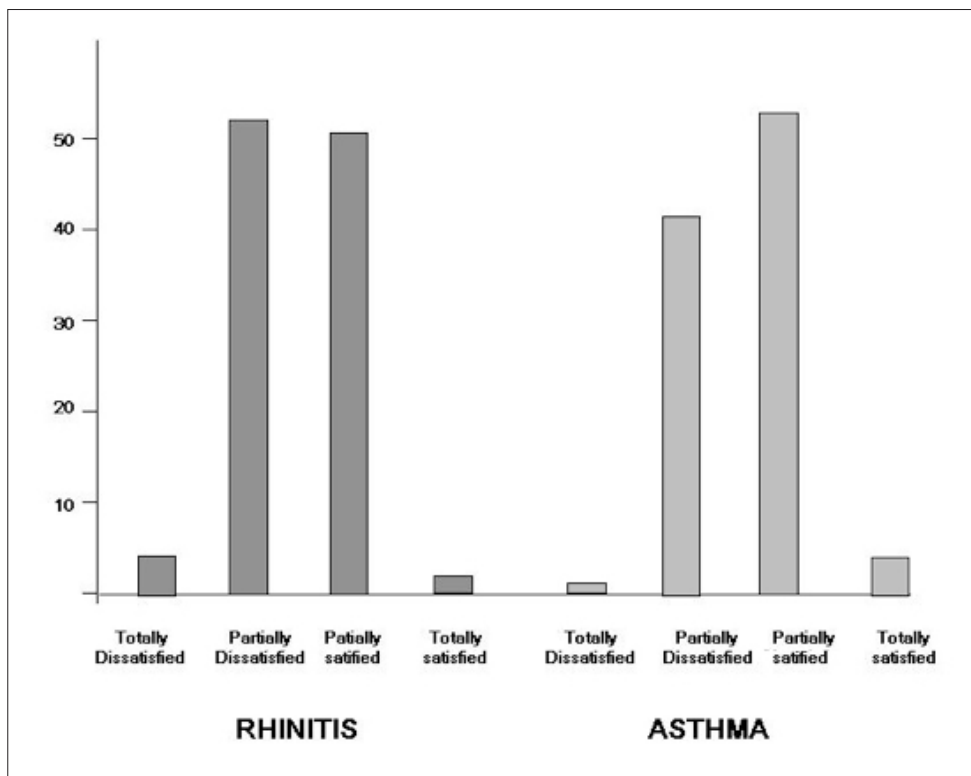


Figure 2 - Percentage distribution of the satisfaction with treatment as reported by patients

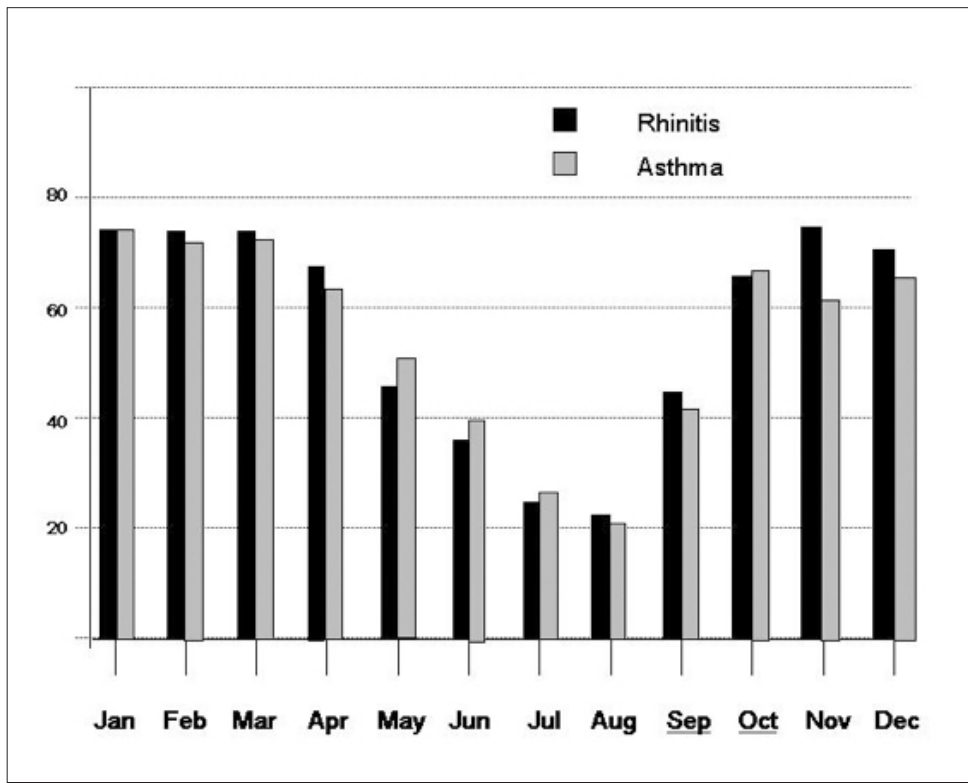


Figure 3 - Yearly distribution of symptoms (% of patients indicating each month as that with worst symptoms)

36% of patients, followed by rhinosinusitis (16%), adenoid hypertrophy (6%) and polyposis (5%).

Out of the population, 56.2% of patients were not at all or partially not satisfied of their treatment for rhinitis, whereas the percentage of dissatisfied patients was about 53% for asthma therapy (figure 2).

According to SPT results, performed with the standard panel used, 34% patients (n = 170) resulted to be monosensitized to HDM, whereas 66% (n = 329) were polysensitized, being the association grass + HDM the most frequently recorded (239/499, 48% patients). The yearly distribution of symptoms (worst period) is summarized in figure 3. It is confirmed that patients have more symptoms during the fall-winter periods.

Discussion

Despite the features of HDM-induced respiratory allergy being well described in literature, and the biology and molecular aspects of mites being well known, there are few data in the literature focused on patients with HDM allergy regarding their characteristics and response to therapy. In the recent past, it was believed that HDM allergy was a “perennial” disease (i.e. present all around the year) (14), whereas it has been recently acknowledged that symptoms and inflammation may vary, ac-

ording to the changes in allergen burden and persistence. For this reason, the traditional classification of “perennial” and “seasonal” allergic rhinitis has been changed in the *Allergic Rhinitis and its Impact on Asthma* (ARIA) document into “persistent” and “intermittent” depending on symptoms’ duration (11), with a subdivision according to the intensity of symptoms into “mild” and “moderate/severe”.

HDMs are a ubiquitous allergen source, with a very well defined biology, but their role in clinical settings is usually the result of deductions, and few data are available on the aspects of mite-induced allergy in everyday clinical practice. For this reason, we undertook this cross-sectional study within a population of HDM sensitised patients to evaluate their main clinical characteristics and their feelings about the treatments received. The survey was questionnaire-based, and the database was filled by allergists who evaluated HDM-sensitized patients. According to the data collected, most of the patients sensitised to HDM resulted to have a severe and persistent rhinitis, frequently associated with conjunctivitis. In addition, it was observed that the worst periods, as far as clinical symptoms were concerned, were limited to autumn-winter, with a relevant improvement during the summer months. This increase in symptoms’ severity during fall is in accordance with the already described “September epidemic” in allergic patients (15) and also with the

reported "seasonality" of HDM. In fact, a study from Australia found that the mite concentrations in beds had a two- to three-fold annual fluctuation during a 7-year period of observation, showing the highest values in late autumn and the lowest values in summer (16). HDM-allergic patients we studied seemed to have a more severe disease, with more frequent comorbidities and impairment of their quality of life, when compared to other kind of allergic sensitizations. Concerning the treatments, that were prescribed according to current guidelines, for rhinitis oral antihistamines were the most prescribed drugs, followed by topical steroids, while for asthma the most prescribed drugs were inhaled steroids, followed by short acting beta2 agonists, long acting beta2 agonists and anti-leukotrienes. However, analyzing patients' satisfaction with the treatment of the allergic disease, more than 50% of them reported to be not satisfied with the therapies. In particular, 53% of patients were dissatisfied (partially or completely) by asthma therapy, and the rate rose to 56.2% concerning the treatment for rhinitis. These cases of allergic rhinitis, mostly satisfying the criteria for severe chronic upper airways disease (SCUAD) (17) are of particular interest because there is a need to control a disease that causes a particularly important impairment of quality of life. In a controlled study by Frew et al. it was showed that patients with seasonal allergic rhinitis resistant to drug treatment had a clear benefit from specific immunotherapy, with symptom and medication scores resulting significantly better in actively than in placebo treated patients. This suggests that specific immunotherapy should be considered as an adjunct to standard therapy in patients with severe allergic rhinitis.

The main limitations of the study are the questionnaire-based method and the selection bias. On the other hand, the large population involved, with a clinically established diagnosis, warrants for a well-selected population.

In conclusion, we found that in a population of HDM-allergic patients a consistent part of the population suffered from moderate to severe allergic disease and that more than half of them were not satisfied by the prescribed drug treatment. This calls for specific studies to be addressed on mite-allergic patients, with the aim to improve the management of the disease and consequently their quality of life.

Funding and conflict of interest

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