

Short communication

Personal risk factors for cypress pollen allergy

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Prevalence of cypress allergy has been steadily increasing in Mediterranean countries (1) and can be considered today as the leading cause of pollinosis around the Mediterranean. Thus, a better knowledge of its risk factors is of utmost importance. On one hand, exposure to cypress pollen has been steadily increasing over the past decades (2) in relation to planting cypress rows close to dwellings. On the other hand, air pollutants could act as a synergistic factor to increase the likelihood of sensitization and disease. Besides, personal risk factors may also be involved, as they have been demonstrated in the closely-related field of mountain cedar allergy (3, 4). To evaluate whether specific personal risk factors could be involved in the occurrence of cypress allergy, we designed a case-control study comparing those personal characteristics in cypress pollen allergic (CPA) patients compared with the gold standard of pollinosis, i.e. grass pollen allergy (GPA).

Material and methods

Criteria for selecting patients

- Cypress-pollen allergic patients (CAP) ($n = 110$) were selected at the outpatient clinic as consecutive patients suffering from atopic respiratory symptoms occurring in wintertime only, with a positive skin prick test to at least *Juniperus ashei* pollens (Stallergenes®, Antony, France).

- Grass-pollen allergic patients (GAP) ($n = 38$) were selected at the outpatients clinic as consecutive patients suffering from atopic symptoms occurring in springtime only, with a positive skin prick test at least to grass pollens (Stallergenes®).

Protocol

It included a standardized questionnaire about: sex, current age, age when pollinosis started, type of symptoms, mother and father's history of atopic diseases, place of birth (in or out Southern France), age when settling in Southern France for patients born out of it and personal history of food allergy.

Besides, all patients underwent skin prick testing using a battery of standardized aero-allergens: (Stallergenes laboratories, Antony, France) *dermatophagoides pteronyssinus*, *dermatophagoides farinae*, cat danders, grass pollen, cypress pollen (actually extracts from *Juniperus ashei*) and parietaria pollen. The allergenic potency of the extracts is expressed in terms of reactivity units per milliliter of solution. The tests were performed on the volar surface of the forearm, by pressing the device gently onto the skin. The results were measured 20 min later using a ruler, by working out the mean of the largest diameter and its orthogonal diameter. We used as criteria to define a positive test a wheal whose diameter was 3 mm or larger than the negative control test (Coca solution).

Statistical analysis

It used the chi-square test for dichotomous variables and analysis of variance for continuous variables. A difference was considered as statistically significant if P was < 0.05 .

Table 1. Overall comparison of personal characteristics of cypress pollen allergy and grass pollen allergy patients

	Cypress-pollen allergy <i>n</i> = 102	Grass-pollen allergy <i>n</i> = 38	<i>P</i> -value
Sex-ratio (M/F)	1.02	2.0	0.001
Mean $\pm$ SD age (years)	41.5 $\pm$ 13.4	37.1 $\pm$ 15.6	0.24
% Born out of our area	39.2%	31.2%	0.61
Mean $\pm$ SD age when symptoms started (years)	32.0 $\pm$ 13.7	17.9 $\pm$ 10.8	0.0002
% Dry cough	16.5%	0%	0.008
% Asthma	38.1%	38.4%	0.85
Maternal history of atopy	15.6%	20.5%	0.37
Paternal history of atopy	11.8%	15.4%	0.58
% Monosensitized patients	40.8%	31.5%	0.30

Results

Comparison of cypress vs grass pollen allergic patients (Table 1)

Highly significant differences were encountered on three items: sex-ratio which was close to 1 in CAP and equal to 2.0 in GAP ; mean age when symptoms started, equal to 32.0 years in CAP and 17.9 in GAP, and percentage of chronic cough, equal to 16.5% in CAP and null in GAP.

Noteworthy, there were no statistically significant differences with regard to birthplace, parental history of atopy and percentage of monosensitized patients.

Comparison of monosensitized vs polysensitized cypress pollen allergy patients

No item showed a statistically significant distribution according to mono vs polysensitization, apart mean age (31.0 vs 25.2) and age when allergic symptoms started which was higher in mono-sensitized CPA (34.9 vs 28.5).

Comparison of monosensitized vs polysensitized grass pollen allergy patients

No difference proved statistically significant, apart again mean age when symptoms started, which was higher in mono-sensitized patients (31.0 vs 25.2).

Comparison of mono-sensitized cypress and grass pollen allergic patients

Mono-sensitized CPA patients demonstrated a lower sex-ratio (0.85), compared with GPA patients (3), a higher mean age at onset of symptoms (34.8 vs 19.7) and a higher prevalence of dry cough (21.4 vs 0). Noteworthy, the percentage of patients born out of the area was very similar in both groups.

Discussion

This case-control study demonstrated that CPA patients have some personal characteristics, compared with the

pollinosis gold standard, i.e. grass-pollen allergy. The sex and age – distributions were significantly different. The control group was chosen in the same allergy clinic. All case and control patients were consecutively enrolled. They were not aware of the goal of the study. Thus, the validity of the study can be reasonably ensured. The higher number of CPA compared to GPA patients exemplifies the fact that the former allergy is nowadays the leading cause of Mediterranean pollinosis.

To the best of our knowledge, no study has been published about the comparison of CAP and GAP. However, in the field of cypress allergy, Bousquet et al. (5) in 1993 compared a group of 26 patients monosensitized to cypress pollen to a group of 63 polysensitized cypress-pollen allergic patients recruited in the same allergy clinic. They concluded that the former group had a later age of onset of symptoms, a total IgE level within the normal range and a lower specific IgE level. In our study also, the mean age of onset of symptoms was larger in one hand in monosensitized CPA than in polysensitized CPA, in the other hand in patients monosensitized to cypress pollen compared with patients monosensitized to grass pollen. Another pollinosis closely related to cypress pollen allergy is the mountain cedar pollinosis, because of a closely-related allergenic species, *Juniperus ashei*. Ramirez (3) compared a group of 80 patients monosensitized to mountain-cedar pollen to 154 patients sensitized also to other aero-allergens. The monosensitized group demonstrated a later onset of allergy symptoms, a lower proportion of family history of atopy and a lower total IgE level (3). Noteworthy, in this latter survey, the percentage of patients born out of the area was higher in the subgroup of monosensitized patients. We did not demonstrate such a difference, either by comparing CPA to GPA patients overall (Table 1) or the subgroups of monosensitized patients. This difference could be related to possible misclassification in our study about previous exposure to cypress pollen before moving to our area. However, this information could not be obtained from the patients. Thus it was not possible to take it into account. Such a misclassification may not have occurred in Ramirez's study because the geographical distribution of Cupressaceae in the United States is much more clearcut. Alternatively, such a difference could be related to the molecular characteristics of both pollens. Reid et al. (4) demonstrated an HLA-DR 4-associated nonresponsiveness to mountain cedar allergen but failed to show a difference in genetic immunoregulation between patients mono or polysensitized to mountain cedar pollen. Ramirez (3) suggested that the occurrence of mountain cedar pollinosis in nonatopic patients could be linked to its carbohydrate composition.

Closely-related observations have been performed in the field of ragweed allergy. Gonczi et al. (6) demonstrated that 35% of Hungarian teenagers with ragweed allergy were sensitized only to this weed whereas the percentage of monosensitization to other pollens was

much lower. Dechamp et al concluded that the sex-ratio was equal to 1 in ragweed-allergic patients and that onset of symptoms could be delayed to adulthood and even old age in those patients (unpublished data).

Conclusion

These clinical and epidemiological observations show that CPA patients demonstrate a peculiar sex-and-age

distribution compared with GPA patients. The molecular basis for explaining such a behavior should be better known.

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