

EDITORIAL

Pollinosis in the southern Europe — Mediterranean area

Introduction

Allergy due to pollen is a major cause of disease in the Mediterranean area of southern Europe. The Mediterranean area comprises not only the European coastal region of the Mediterranean sea but also the Asiatic Middle East including Turkey, Syria, Lebanon and Israel and the North African coast consisting of Egypt, Libya, Tunisia, Algeria and Morocco. The climatic conditions are also similar in a part of southern Europe which is not Mediterranean, namely Portugal and a part of Spain, and regions in south-eastern Europe [1]. Therefore, climatic conditions and the pollen seasons are similar.

In these areas the dominant pollens are grass *parietaria* or pellitory wall and olive trees. Plantain and mugwort also cause disease in a small number of patients but other tree pollens are clinically irrelevant.

In the 1970s it was observed that pollen allergy in childhood was infrequent. Today however, pollen allergy is common in children, though the reasons for this are poorly understood. Changes in indoor and outdoor pollution, occidental life [2] and dry weather in recent years in southern Europe have all been suggested along with other unidentified factors. In recent years much research in the field of pollen allergy has been directed at the identification of the most relevant allergen epitopes on pollens. Specific immunotherapy is commonly used to treat pollen allergy and a better knowledge of molecular allergens which induce specific IgE responses in allergic patients is an important step towards better understanding of the immunological mechanisms associated with specific immunotherapy.

Allergic responses are associated with TH₂ cells producing IL-4, IL-5, IL-10 and IL-13 [3–5]. The mechanisms involved in switching TH₀ cells to TH₂ cells are beginning to be identified. The relationship between environmental exposure and genetic predisposition is a cornerstone in the understanding of immune response to allergens.

Allergen peptides can be used to induce a state of tolerance in specific T cell clones. The use of a 29 amino acid peptide from chain 1 of Fel d 1 allergen induced a state of T-cell non-responsiveness characterized by reduced production of IL-2, IL-4 and IFN γ [6,7]. A major problem, however, exists with the clinical use of immunodominant allergenic epitopes in sensitized patients.

The existence of multiple epitopes in allergens gives rise to the possibility of the escape of non-immunodominant epitopes through the induction of anergy with persisting clinical symptoms on allergen exposure. This has important practical consequences as it is virtually impossible to treat patients by mapping specific T-cell epitopes of allergens to individual patients. Some immunodominant epitopes in pollen associated with the Mediterranean region have been characterized, such as grasses [8,9], olive [10,11] and *parietaria* [12]. In this issue Cardaba *et al.* [10] demonstrates that most of the T-cell epitopes in Ole e 1 which are recognized by sensitized patients are in the carboxy-terminal region. The concept of using immunodominant epitopes in specific immunotherapy supposes that the IgE-mediated response to allergen can be abrogated with consequent clinical benefit. There is no experience with this kind of immunotherapy and the issue of minor epitopes being clinically relevant has yet to be resolved [13]. If the latter is the case it would contribute to the failure of form of immunotherapy; however, the characterization of T-cell epitopes in allergens is an important step towards answering these questions.

The interaction between genetics and the environment determines the allergic response of an individual. The prevalence of IgE response to major allergens is genetically determined at population level. A multicentre study [14] demonstrated that the frequency of sensitivity to major recombinant allergens of timothy grass pollen (*Phleum pratense*) rPhI p 1, rPhI p 2 and rPhI p 5 varied from country to country ranging from 65% to 100% for rPhI p 1, from 45% to 93% for rPhI p 5 and from 10% to 77% for rPhI p 2. The IgE response to pan-allergens such as profilin in this study ranged between 5% and 15%. In a similar study in a Portuguese population we observed the prevalence of reactivity to profilin in our population with grass pollen allergy to be 22%. The population recognizing the profilin had an enrichment in the HLA allele DRB1*0701 [15].

In recent years many studies have examined the cross-reactivity between allergens and particularly between sensitivity to pan-allergens as profilin in trees, grass pollens, fruits and vegetables. The clinical consequences of this cross-reactivity are being evaluated [11]. The characterization of allergen epitopes recognized by different allergic populations and the relationship between these epitopes, predominant HLA alleles and specific IgE immune responses will help in the future to define which T-cell epitopes in a given population could be used in specific immunotherapy.

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