

Cypress-Sensitized Asymptomatic Patients During the Pollen Season: Sensitization or Simply Cross-reactivity?

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I read with interest the article "Epidemiology of Cypress Pollen Allergy in Montpellier" by Caimmi et al [1], who reported that 20.7% of patients were sensitized to cypress pollen in the Montpellier area and that only 46.4% presented symptoms during the pollen season. The latter finding is particularly interesting and consistent with the findings of our group [2], namely, that only 44.55% of patients sensitized to Cupressaceae reported symptoms (rhinitis, conjunctivitis, cough, and asthma) during the winter, when the airborne cypress pollen concentration is high. Therefore, about half of the patients sensitized to cypress were not affected by this pollinosis. However, Caimmi et al do not provide an interpretation of this result. In their article, they affirm that, as a proportion of patients were already treated in a general practitioner's outpatient clinic, the reported symptoms may be underestimated. I think that the explanation for this hypothesis should be based on molecular allergology [3]. In asymptomatic individuals, sensitization to cypress may be due to cross-reactivity between immunoglobulin (Ig) E and proteins with structures that are similar to the allergenic components of other pollen and *Cupressaceae* extracts used for skin prick tests (SPT). The IgE antibodies for a given allergen can also bind to homologous molecules of panallergens (eg, profilin, calcium-binding protein, lipid transfer protein, and thaumatin-like protein) in different plant species [3]. In fact, in polysensitized individuals, we often—and wrongly—attribute pollen sensitization (detected using SPT with allergen extracts) to cosensitization rather than to cross-reactivity due to panallergens.

Pollen extracts of various Cupressaceae species are characterized by low protein and high carbohydrate content. Protein and, more particularly, carbohydrate epitopes can be involved in allergenic cross-reactivity between allergens from taxonomically related and unrelated pollen families [4,5]. Olive and grass pollens contain allergens such as Ole e 2, Phl p 12 (profilin), and Phl p 7 (calcium-binding protein), which can cross-react with other constituents of pollens from unrelated species [3,6,7], including the Cupressaceae family. Furthermore, some calcium-binding proteins (Cry j

4, Jun o 4, and Cup a 4), profilins (Cup s 8), and thaumatin (Cup a 3, Cry j 3, Cup s 3, and Jun a 3) from Cupressaceae species [8] could express similar molecular characteristics of unrelated pollen panallergens involved in cross-reactivity. In fact, a recently identified allergen of *Cupressus arizonica*, Cup a 4, a calcium-binding protein, is structurally similar to other calcium-binding allergens, such as Ole e 3, Ole e 8, and Phl p 7 [9]. In confirmation of this hypothesis and according to the findings of others [9], we observed higher significant cosensitization among Cupressaceae and other pollen extracts, in particular, grasses (53.06%), olive (42.51%), and other trees (26.5%) [2]. These values were considerably higher than those found in patients not sensitized to Cupressaceae. Caimmi et al [1] do not report the cosensitizations found in their research. Therefore, sensitization to Cupressaceae might not be clinically relevant in some patients. Sin et al [10] observed that only 37 of the 50 patients sensitized to cypress had positive serum specific IgE to cypress pollen and that the results of a nasal provocation test with cypress allergen extract were positive in only 1 monosensitized patient [10].

Conflicts of Interest

The author declares that he has no conflicts of interest.

References

1. Caimmi D, Raschetti R, Pons P, Dhivert-Donnadieu H, Bousquet PJ, Bousquet J, Demoly P. Epidemiology of cypress pollen allergy in Montpellier. *J Investig Allergol Clin Immunol*. 2012;22(4):280-5.
2. Sposato B, Scalese M. Prevalence and real clinical impact of *Cupressus sempervirens* and *Juniperus communis* sensitizations in Tuscan "Maremma", Italy. *Allergol Immunophthol (Madr)*. 2011; in press, doi: 10.1016/j.aller.2011.08.001.
3. Sastre J. Molecular diagnosis in allergy. *Clin Exp Allergy* 2010;40:1442-60.
4. Mari A, Iacovacci P, Afferni C, Barletta B, Tinghino R, Di Felice G, Pini C. Specific IgE to cross-reactive carbohydrate determinants strongly affect the in vitro diagnosis of allergic diseases. *J Allergy Clin Immunol*. 1999;103:1005-11.
5. Iacovacci P, Pini C, Afferni C, Barletta B, Tinghino R, Schinina E, Federico R, Mari A, Di Felice G. A monoclonal antibody specific for a carbohydrate epitope recognizes an IgE-binding determinant shared by taxonomically unrelated allergenic pollens. *Clin Exp Allergy*. 2001;31:458-65.
6. Constantin C, Quirce S, Poorafshar M, Touraev A, Niggemann B, Mari A, Ebner C, Akerstrom H, Heberle-Bors E, Nistrand M, Valenta R. Micro-arrayed wheat seed and grass pollen allergens for component-resolved diagnosis. *Allergy*. 2009;64:1030-7.
7. Swoboda I, Twaroch T, Valenta R, Grote M. Tree pollen allergens. *Clin Allergy Immunol*. 2008;21:87-105.

8. Allergome. The Platform for Allergen Knowledge. <http://www.allergome.org>. Accessed July 24, 2011.
9. Pico de Coaña Y, Parody N, Fuentes MÁ, Carnés J, Roncarolo D, Ariano R, Sastre J, Mistrello G, Alonso C. Molecular cloning and characterization of Cup a 4, a new allergen from *Cupressus arizonica*. *Biochem Biophys Res Commun*. 2010;401:451-7
10. Sin AZ, Ersoy R, Gulbahar O, Ardeniz O, Gokmen NM, Kokuludag A. Prevalence of Cypress pollen sensitization and its clinical importance in Izmir, Turkey, with Cypress allergy assessed by nasal provocation. *J Investig Allergol Clin Immunol*. 2008;18:46-51.

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