

Could Profilin Be a ‘Canary in a Coal Mine’ of the Increasing Allergy Epidemic?

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Valenta et al. [1] described profilin as an allergen in the early 1990s. Profilins, in the vegetable kingdom, are a highly conserved family of proteins involved in the control of the polymerization of actin. Due to their poor stability, they are, in general, considered to possess limited clinical relevance [2]. On the other hand, due to their high degree of sequence identity and their ubiquity, they are known to be major confounding factors in the extract-based diagnosis of seasonal airborne allergies.

Recent studies have proved that in the vast majority of patients, profilin sensitization occurs via pollen exposure, and a clear association of profilin prevalence to grass pollen counts has recently been demonstrated [3]. The explanation is that grasses possess the highest relative concentration of profilin [4]. Interestingly, in areas with very high grass pollen exposure, profilin prevalence reaches 60%.

Recently, it was demonstrated that in such regions profilin at very low doses can induce severe food-allergic reactions [5]. In an allergen study involving subcutaneous immunotherapy with an accelerated schedule, profilin-sensitized patients showed higher specific IgE levels to major grass allergens and a higher probability of suffering from systemic side effects, particularly late-phase urticarial reactions [6]. All of these findings support the

idea that profilin sensitization and profilin hypersensitivity prevalence in a particular area have the potential to predict the allergic inflammation level associated with grass pollinosis.

Due to its association with the progression of grass pollinosis, profilin was thought to have limited clinical relevance in pediatric patients. In the paper by Asero et al. in this issue of *International Archives of Allergy and Immunology* [7], an epidemiological, multicenter study of the prevalence and clinical relevance of profilin in an Italian sample of pollen-allergic children is presented. The study was performed on a sample of 1,271 children recruited from across Italy. Surprisingly, 25% of the patients were sensitized to profilin, with 16% being pre-school children. A significant proportion of them were referred with oral allergy syndrome, in many cases without sensitization to any other potential food allergen.

These data challenge the view of profilin's relatively low clinical relevance in pediatric patients. Extrapolating the figure to the general population, these figures imply that, when assuming a 20–25% prevalence of pollinosis, up to 5% of Italian children might be expected to be sensitized to profilin.

As has been reported for adults, in this study, profilin sensitization prevalence increases along the grass pollen

gradient as well as with disease duration, suggesting that profilin monitoring might be a good way to predict allergic inflammation level. According to Asero et al. [7], 'early sensitization to profilin... might thus be an early biomarker of a strong atopic predisposition and therefore imply a more severe clinical history of pollen allergy'. Another interesting and practical piece of information is that the potential involvement of profilin in oral symptoms should be investigated, even in the preschool population.

Several authors have investigated potential links between inhaled allergens and severe allergic pathologies, as in the case of eosinophilic esophagitis [8]. The role of sensitization and clinical reactivity to profilin in early life should also be investigated in this context, in particular, the potential synergic effect on ongoing or past food sensitizations (e.g. to milk and egg).

The study by Asero et al. [7] has some limitations, the most relevant being the lack of objective demonstration of food allergy by provocation test, but, on the other hand, it proves that this type of survey can be easily performed using new molecular diagnostics, either in vitro or in vivo [9, 10].

Performing epidemiological studies periodically would be a way to clarify the perceived increase in the prevalence and severity of allergic diseases.

From the first description of profilin as an allergen, there has been a progressive shift in the perception of its clinical relevance. A plausible explanation for this is that allergy severity has been increasing during the last decades and that profilin may be 'a canary in a coal mine' of the progression of allergic diseases.

References

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