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Letter to the Editor

The pragmatic relevance of Pru p 3 sensitization in patients with pollen allergy

Pertinence de la sensibilisation à Pru p 3 chez les patients polliniques

Keywords: Pru p 3; Sensitization; Allergy; Pollen food syndrome; Pollen allergy

Mots clés : Pru p 3 ; Sensibilisation ; Allergie ; Allergie croisée pollens-aliments ; Allergie pollinique

Dear Editor,

Lipid transfer protein (LTP) belongs to the prolamin superfamily and is implicated in cuticle formation and defence against pathogens [1]. LTP is found in several plant food sources, such as fruit, vegetables, nuts, pollens, and latex. LTP is a true food allergen and can cause sensitization throughout the digestive tract and it may be a potent food allergen resistant to thermal and acid processing [2]. LTP is the most frequent cause of both primary food allergy and food-dependent anaphylaxis in Italy [3]. The LTP allergen Pru p 3 is the major peach allergen [1]. Pru p 3 is commonly considered a pan-allergen since it is shared by several foods [1]. Peach is commonly considered the primary sensitizer to LTP in the Mediterranean area. There have been reports of high levels of serum IgE to Pru p 3 being associated with increased probability of systemic allergy to peach [4]. A further study has partially confirmed these findings [5].

Pollen-food syndrome (PFS) is defined by the onset of symptoms in patients with pollen allergy after eating fruit or vegetables. The severity of symptoms ranges from mild, such as symptoms confined to oral cavity (so-called oral allergy syndrome [OAS]), to life-threatening, such as anaphylactic shock. In this regard, LTP sensitization is considered a potentially dangerous risk factor for severe allergic reaction. Consequently, some allergists prescribe restricted diets with avoidance of many types of fruit and vegetable potentially cross-reacting with Pru p 3, and auto-injectable epinephrine may be prescribed for patients with Pru p 3 sensitization alone. On this question, a recent study conducted in 3937 Italian subjects reported a prevalence of Pru p 3 sensitization of 16.7% [6]. More interestingly, Pru p 3 IgE production is age-dependent for both positive tests and serum level [6]. As this matter is particularly intriguing, we wished to test the hypothesis concerning the clinical and pragmatic relevance of Pru p 3 sensitization in clinical practice. We therefore carried out a retrospective analysis of the medical records of 314 consecutive patients (170 females, mean age 40.4 years) with pollen

allergy. All were referred to a laboratory for IgE testing. Inclusion criteria were documented pollen allergy and level of serum IgE specific to Pru p 3. The study met the local ethics committee criteria for personal data management and all patients provided written informed consent to take part.

Serum levels of specific IgE for Pru p 3 were determined using the IFMA procedure (ImmunoCAP Thermo Fisher Scientific, Uppsala, Sweden) on peripheral blood samples. Serum was collected into gel-separator tubes, centrifuged and stored at -20 °C pending analysis. Measurement of circulating specific IgE antibodies was performed according to the manufacturer's instructions [7]. Specific IgE levels were expressed in kUA/L using the traceable calibration of the 2nd IRP WHO for Human IgE, with 0.35 kUA/L being taken as the cut-off point [8].

Statistical analysis was performed using the statistical software package Medcalc 9 (Frank Schoonjans, BE).

Twenty-nine patients (9.24%) were sensitized to Pru p 3. Sensitized patients were then subdivided into two groups: patients with allergic reaction after eating LTP-containing food (true allergy, TA) and asymptomatic patients after eating LTP-containing food (mere sensitization). Eleven patients (38% of sensitized patients and 3.5% of the entire sample) presented true allergy whereas 18 patients (62% and 5.7% respectively) were simply sensitized.

Regarding the severity of allergic symptoms, 6 patients had OAS, 2 patients had urticaria, 1 patient had angioedema, 1 patient had OAS and angioedema, and 1 patient had OAS and urticaria. No patients presented severe allergic reaction.

Furthermore, serum Pru p 3 IgE was determined in the two sub-groups: patients with true allergy had significantly higher values than patients with mere sensitization (3.9 ± 1.3 vs. 2.5 ± 0.9 kUA/L; $P < 0.01$).

The current study demonstrates that Pru p 3 sensitization in a group of patients with respiratory pollen allergy is less than 10%. This finding is consistent with a previous survey indicating a prevalence of 16%, but it should be noted that IgE production

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is age-dependent and tends to decrease over time, and the mean age of the present sample is about 40 years. More interestingly, the percentage of patients with true allergy to LTP-containing food was rather low, and overall, the severity of clinical signs was mild to moderate in all patients. Another noteworthy finding is the relevance of serum IgE level: the higher the serum level the greater the odds for true allergy. This outcome is consistent with Par j 2 IgE level assessment. In this regard, it should be noted that Par j 2 belongs to LTP family, despite being an allergen able to induce only respiratory allergy and not food allergy.

The current study naturally has some limitations: the setting concerning respiratory allergy outpatients, the relatively limited number of patients, the lack of follow-up, and the specificity of the geographic area considered. The Liguria region is in fact characterized by Bet v 1 predominance that could possibly affect sensitization patterns [9].

In any event, the key conclusion is that discovery of Pru p 3 sensitization does not necessarily indicate a diagnosis of true allergy to Pru p 3 food allergen. Only the demonstration of a close relationship between ingestion of a sensitizing Pru p 3 allergen and consistent occurrence of symptoms is mandatory for allergy diagnosis, but the latter should be confirmed by a double-blind food oral challenge. Thus, a thorough work-up is fundamental in Pru p 3-sensitized patients. Avoidance diets should be prescribed only for true food allergy patients and epinephrine should be given only where anaphylactic reaction is unequivocally documented. In this respect, it must be considered that all tolerated foods may be ingested so as to maintain immunological and clinical specific tolerance. This concept has indeed been reinforced by the LEAP study: early introduction of food allergens promotes tolerance more successfully than avoidance [10].

In conclusion, Pru p 3 sensitization requires adequate interpretation and management in clinical practice.

Authors' contribution

All co-authors contributed to the paper.

Disclosure of interest

The authors declare that they have no competing interest.

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