

BRIEF COMMUNICATION

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Prevalence of Specific IgE to Wheat Flour Allergens in Romanian Pediatric Population

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INTRODUCTION

This is a short report on the incidence of wheat-specific IgE allergens in the pediatric population of Romania.

MATERIALS AND METHODS

The present study was conducted from 2012 to 2013 on 1097 children to determine the frequency of wheat-specific IgE antibodies as determined using EUROIMMUN immunoblot tests. The calculation of the prevalence of wheat-specific sIgE antibodies did not require study inclusion criteria for patients. This allowed performance of testing on more children to calculate the prevalence of these antibodies in the pediatric population as a whole.

The gender distribution was 59.7% males and 40.3% females. The test used to detect wheat-specific IgE antibodies was an *in vitro* semi-quantitative

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method for the detection of inhaled allergens or food allergens in serum or plasma. The measuring range and implicit results are represented as enzyme-allergo-sorbent test scores of 0 to 6 according to manufacturer recommendations. A score of 0 signifies no specific antibody detected (concentration < 0.35 kU/l); 1 signifies very low detection of antibodies and sensitization, often without clinical symptoms (concentration 0.35 - 0.7 kU/l); 2 signifies low antibody titer and sensitization, often with noticeable clinical symptoms (concentration 0.7– 3.5 kU/l); 3 signifies significant antibody titer, clinical symptoms usually present (concentration 3.5– 17.5 kU/l); 4 signifies high antibody titer, with clinical symptoms (concentration 17.5 - 50 kU/l); 5 signifies very high antibody titer (concentration 50 - 100 kU/l); 6 signifies extremely high antibody titer (concentration > 100 kU/l).

The prevalence of sensitization was calculated to be f4 according to class 1 positivity, where positivity shows no clinical symptoms to which the body responds. The prevalence of allergy was calculated as f4 for classes 2, 3, 4, 5, and 6, where positivity implies the presence of clinical symptoms to which the body responds.

“Sensitization” is the body producing IgE that develops specifically for that particular allergen, but without experiencing a reaction.^{1,2} The immune

reponse of an allergy begins with sensitization.^{3,4}

The present study focused on the following allergens: f4 wheat flour, f49 apple, f35 potato, f31 carrot, f17 hazelnut, f13 peanut, f14 soy, f9 rice, e204 bovine serum albumin, f78 casein, f77 beta-lactoglobulin, f76 alpha-lactalbumin, f3 fish, f2 cow's milk, f75 egg yolk, f1 egg white, m6 *Alternaria alternata*, m3 *Aspergillus fumigatus*, m2 *Cladosporium herbarum*, d2 *Dermatophagoides farinae*, d1 *Dermatophagoides Pter*, and gx mixture of herbs.

RESULTS

No statistically significant association between patient gender and the presence of f4 was observed ($\chi^2=0.27$, $df = 1$, $n = 1097$, $p= 0.61$). The sIgE antibody detected as f4 was not present in 1012 patients. Very low sIgE antibody titers for f4 (frequently no clinical symptoms where sensitization is present) were detected in 65 patients. Low sIgE antibody titers for f4 (sensitization, frequently with clinical symptoms in the upper range of class) were detected in 13 patients. Significant sIgE antibody titers for f4 (clinical symptoms usually present) were detected in 5 patients. Very high sIgE antibody titers for f4 were detected in 2 patients. The prevalence of sIgE as sensitization to f4 according to class 1 positivity was 5.92% and the prevalence of sIgE to allergy to f4 according to classes 2, 3, 4, 5, and 6 positivity was 1.82%.

No statistically significant differences between class frequencies for f4 and patient gender was observed (Fisher's exact test, test statistic = 1.62, $df = 4$, $n= 1097$, $P= 0.85$). There was a weak to moderate positive association between f4 and the following parameters f49, f35, f31, f17, f14, f9, e204, f78, f77, f76, f3, f2, f75, f1, m6, m2, d2 and gx (correlation coefficient $p<0.30$, $p<0.001$). No association was observed

between f4 and m3 ($p=0.13$) or d1 (Spearman correlation coefficient: $p = 0.06$).

CONCLUSION

Patients showing sensitization to wheat flour should be considered at risk for allergy to wheat flour. Male gender was not a predisposing factor for wheat flour allergy. The following possible triggers for wheat flour sensitization and wheat flour allergy were noted for allergens that have not been reported thus far: mites, *Dermatophagoides farinae*, molds, *Alternaria alternata*, and *Cladosporium herbarum*.

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