Peanut allergen sensitization profile in Brazil

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To the Editor,

The prevalence of peanut allergy in children is around 0.2-4.5%(1) and varies geographically, with different sensitization patterns depending on genetics, lifestyle, and environmental exposure (2). The diagnosis is done by suggestive clinical history upon peanut ingestion aided by the serum allergen-specific IgE (sIgE) to peanut extract, components and basophil activation test. Nonetheless, sensitization can be present despite clinical symptoms or as a cross-reactivity phenomena(1). Allergen sensitization has also been postulated to have a predictive role in the development of clinical allergies(3).

Our objective was to describe the profile of peanut sensitization and its possible PR-10 and lipid-transfer proteins (LTP) cross-sensitization in Brazil.

Data was collected from a previous cross-sectional multicenter study (PROAL II)(3), where atopic participants (age 6 months to 18 years) had their sensitization profile compared to asymptomatic children. Participants that presented with sIgE≥0.35kU$_A$/L to whole-peanut (Pn) and/or peanut-components (Ara h 1, 2, 3, 8, and 9) were included. The ImmunoCAP® (ThermoFisher Scientific – Uppsala, Sweden) was used to determine the levels of sIgE. ImmunoCAP ISAC® of participants with atopic dermatitis (AD) and food allergy (FA) was analyzed to the same allergens. Sex, age, principal allergy condition, concomitant allergy disease were assessed. The Federal University of São Paulo Ethics Committee approved this study (No.824.156).

From the 470 participants, 97 (20.6%) were positive to Pn-sIgE and/or its components (age 10-204 months, median 72) (Figure 1).

Participants with positive Pn-sIgE had a mean of 5.57kU$_A$/L, range 0.36-56.0kU$_A$/L. As main allergy condition, 13.7% (n=12) had asthma (A) and/or allergic rhinitis (AR), 41.3% (n=36) had AD, 32.1% (n=28) had FA, 3.4% (n=3) had recurrent wheezing (RW) and 9.2% (n=8) were healthy controls. Regarding positivity to the components, 22 (25.2%) were positive to Ara h 1, 29 (33.3%) to Ara h 2, 28 (32.1%) to Ara h 3, 17 (19.5%) to Ara h 8 and 24 (27.5%) to Ara h 9 (Figure 2). Forty-six underwent ISAC analysis, with 37 (80%) negatives to allergens, probably due to assay's lower sensitivity. Seven (15%) were positive to one or more Ara h and two (4%) were positive to PR-10 or LTP allergens.

There was no difference in the levels of Pn-sIgE for the participants with AD, A/AR, FA, RW, and controls (p=0.613).

In the 10 Pn-sIgE negative participants, but positive to peanut-components, the main allergy condition was AD (n=7) followed by A/AR (n=3). Four were sensitized to Ara h 1, five to Ara h 2, three to Ara h 3, four to Ara h 8 and three to Ara h 9(Figure 2). Only two had ISAC analysis, both without sensitization.

In our cohort, one in five had a positive Pn-sIgE and/or peanut-component sIgE. This is a higher prevalence of sensitization than the one observed in Japan (4).

The storage proteins, Ara h1, 2, and 3 were the most prevalent in our participants, but the majority (45.9%) were only sensitized to Pn-sIgE as observed in the United States (5). These components are relevant in North/Central Europe(2). Vereda *et al*(5) reported that two-thirds of the Spanish patients had sensitization to Ara h 9, and from those, 66% were monosensitized. Despite having 24/87 sensitized to Ara h 9, our monosensitized participants were only six. For Ara h 8 this was even less. In this cohort, there was a high proportion of AD patients that could per se increased sensitization, although healthy controls also presented with sensitization (9.2%). Component analysis by ISAC were almost all negative including to LTP and PR-10.

In conclusion, peanut sensitization among Brazilians is mostly due to primary sensitization than cross-reactivity and that should be given consideration when evaluating a patient with suspected peanut allergy.

Key Words: peanut; sensitization; cross-reactivity

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Figure 1 - Percentage of positivity to peanut-components serum-specific IgE

Figure 2 - Mean and range for whole-peanut serum-specific IgE and peanut components obtained by ImmunoCAP.