

PREVALENCE OF PEANUT SENSITIZATION IN A POPULATION OF 4,737 SUBJECTS - AN ALLERGO-VIGILANCE NETWORK ENQUIRY CARRIED OUT IN 2002

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(membres du réseau d'Allergo-vigilance en fin d'article)

SUMMARY:

A total of 4,737 people consulting allergologists were routinely tested for peanut sensitization. The study involved 84 allergologists in the Allergo-Vigilance Network over a period of 30-60 consecutive days. Investigation procedures were identical. Results classified subjects into four groups according to the clinical history and prick-tests to common inhalants:

- group 1: subjects suspected of having a food allergy;
- group 2: subjects with ongoing atopic disease;
- group 3: subjects with an underlying predisposition to atopy, as showed by one or more positive results to prick-tests with airborne allergens;
- group 4: non atopic subjects.

The sensitization rates were 22.7%, 8.7%, 4%, and 0.4% respectively. Assuming that 25% of the French population is allergic, the rate of sensitization to peanut in the general population should be between 1% and 2.5%. Considering a ratio of 3.3 between sensitization and clinical allergy as plausible, the prevalence of peanut allergy could be 0.3% to 0.75% of the French population. This figure is lower than that for the UK, the US and Canada (0.8% to 1.5%). The correlation between the data in this study and those from previous epidemiological studies validates the methodology used in this type of enquiry.

One of the aims of the Allergo-Vigilance Network set up in 2001 is to collect data from a large number of people (1, 2). We present here the results of a study carried out in 2002 by 84 allergologists in the Allergo-Vigilance Network. The primary aim was to assess the prevalence of peanut sensitization in the French population seeking treatment for various allergic disorders. The second objective was to determine whether there was any difference in risk of peanut sensitization in people with ongoing atopic disease, in those with an underlying predisposition to atopy (shown by positive prick-tests) and finally in non atopic people.

INTRODUCTION

The Allergo-Vigilance network, set up in 2001, includes 331 members, all of them being allergologists. Cases of severe, prelethal or even lethal anaphylaxis are regularly reported and registered, whatever the cause: either food, or drug, or hymenoptera sting, or injection for specific immunotherapy, or idiopathic anaphylaxis. Besides this primary activity, one of the aims of the Allergo-Vigilance Network is to collect allergologic data from a large number of people (1, 2). We present here the results of a study carried out in 2002 by 84 allergologists in the Allergo-Vigilance Network. The primary aim was to assess the prevalence of peanut sensitization in the French population seeking treatment for various allergic disorders. The second objective was to determine whether there was any difference in risk of peanut sensitization in people with ongoing atopic disease, in those with an underlying predisposition to atopy (shown by positive prick-tests) and finally in non atopic people.

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METHODOLOGY

For one to two month, prick-tests to peanut were carried out systematically on all patients whose disorder justified undergoing prick-tests. To avoid bias, only patients seen for the first time were included.

For the prick-tests, either native peanut (powdered roasted peanut) or an allergen extract (Allerbio® or Stallergènes®) was used.

■ The criteria for positive prick-tests were defined as follows:

- The negative control being definitively negative:
 - if the histamine or codeine control was ≥ 3.5 mm, the prick- test to peanut was positive if ≥ 3 mm ;
 - if the positive control was ≤ 3 mm, the prick-test to peanut was positive if ≥ 2.5 mm.
- The patients were divided into four groups:
 - *Group 1*: those suspected of having food allergy based on clinical features and time elapsing between ingestion of food and symptoms.
 - *Group 2*: those being treated for presently evolving atopic disease (atopic dermatitis, allergic rhinitis,

allergic asthma) and for whom allergy tests confirmed sensitization to at least one common airborne allergen.

- **Group 3:** those seen for diverse reasons but for whom the prick-tests with the 12 reference airborne allergens evidenced sensitization to at least one airborne allergen (underlying atopic predisposition).
- **Group 4:** non atopic people seen for various reasons: for example, reaction to medicinal products or vague skin eruption, but without a history of atopy, and negative to prick-tests with common airborne allergens.

■ **Results:** 84 allergologists responded, of whom 73 were in France and 4 were in French overseas territories (Fort de France: 1, Pointe-à-Pitre: 2, Reunion island: 1). Seven were in foreign countries (Algeria: 1, Belgium: 3, Morocco: 1, Poland: 1, Switzerland: 1).

➤ In France, the replies were distributed as follows:

- North: 51
- South: 22

➤ In France, the peanut sensitization tests were carried out using:

- an extract from Stallergènes: 40 allergologists;
- an extract from Allerbio: 27 allergologists;
- native roasted peanut: 5 allergologists;
- 12 allergologist did not specify the material they used.

Since there was no significant difference in results depending on the allergen extracts used, the analysis was performed on pooled skin prick-tests.

A total of 4,737 people underwent prick-tests to peanut.

PREVALENCE OF PEANUT SENSITIZATION ACCORDING TO GROUP AND LOCATION

■ Group 1: 946 people (table 1)

➤ A high rate of peanut sensitization was detected in those with suspected food allergy. It was significantly higher in France than in the overseas territories

($p < 0.001$). There was a significant difference ($p < 0.05$) between prevalence in the South of France (25.3%) and the North of France (21.4%).

■ Group 2: 2,609 people with ongoing atopic disease (table 2)

➤ The results for the South and North of France were similar: 8.8% and 8.5%.

	Positive prick-tests (PT) (n)	Negative prick-tests (PT) (n)	% positive PT
Foreign countries and French overseas territories	14	178	7.3 %
France (South)	61	180	25.3 %
France (North)	110	403	21.4 %

Table 1: Prevalence of peanut sensitization in 946 people with suspected food allergy.

	Positive prick-tests (PT) (n)	Negative prick-tests (PT) (n)	% positive PT
Foreign countries and French overseas territories	32	630	4.83 %
France (South)	71	735	8.8 %
France (North)	97	1044	8.5 %

Table 2: Prevalence of peanut sensitization in 2,609 people with ongoing atopic disease.

	Positive prick-tests (PT) (n)	Negative prick-tests (PT) (n)	% positive PT
Foreign countries and French overseas territories	3	42	6.7 %
France (South)	5	82	5.7 %
France (North)	5	161	3 %

Table 3: Prevalence of peanut sensitization in 298 people without ongoing atopic disease, but with a predisposition to atopy as determined by prick-tests to airborne allergens.

	Positive prick-tests (PT) (n)	Negative prick-tests (PT) (n)	% positive PT
Foreign countries and French overseas territories	2	125	1.6 %
France (South)	1	246	0.4 %
France (North)	2	508	0.4 %

Table 4: Prevalence of peanut sensitization in 884 non atopic people.

There was a significant difference ($p < 0.001$) in the combined prevalence in foreign countries and French overseas territories compared to that for France.

■ Group 3: 298 people with underlying atopic predisposition (table 3)

➤ The rate of underlying sensitization was between 3% and 6.7% ($p > 0.1$). There was no difference in prevalence between foreign countries and French overseas territories.

■ Group 4: 884 people (table 4)

➤ The prevalence of peanut sensitization was low: 0.4%, slightly higher in French overseas territories ($p < 0.05$). Comparative figures for countries are given in Table 5.

	France	Belgium and Switzerland	Poland	Algeria and Morocco	West Indies and Reunion
Total number of subjects investigated	3711	238	122	351	315
I % positive PT	22.7 % 171/754	14.3% 5/35	6.1 % 5/82	21.6% 8/37	2.8% 1/36
II % positive PT	8.6 % 168/ 1947	16.5 % 17/103	11.5% 3/26	1.3 % 4/310	3.8% 8/208
III % positive PT	4 % 10/253	2.8% 1/36	Ne 1/8	Ne 1/1	2.9% 1/34
IV % positive PT	0.4 % 3/757	1.2 % 1/82	Ne 0/5	Ne 0/3	2.9% 1/35

Table 5: The prevalence of peanut sensitization by country.

DISCUSSION

When people with a definite predisposition to atopy (meeting specific criteria) are considered (groups 2 and 3: 2,907 subjects) together with the non atopic group (group 4: 884 subjects), it seems that the atopic population represents at least 76.7% of the total population consulting allergologists.

Inter-country comparisons must be interpreted with care. In order to avoid comparisons based on different diagnostic approaches, only group 2 (subjects with ongoing atopic disease) will be taken into account. In this group, peanut sensitization appears to be less frequent in Martinique, Guadeloupe, Algeria and Morocco than in France. Taking the complete sample of the population in France (3,711), the peanut sensitization rate is 9.5% (352).

If an estimated 25% of the entire French population (60 million people) have a predisposition to atopy (i.e. 15 million), the rates of peanut sensitization observed (3% to 8.8%, i.e., the minimal and maximal figures in groups 2 and 3) plausibly represent from 450,000 to 1,320,000 people. An extra 0.4% can be added for potential non atopic people with peanut sensitization; that is a further 180,000. Overall, the rate of peanut sensitization could be between 1.05% and 2.5%. This value is comparable to those for children in other countries: 1.5% to 3.3% in the United Kingdom (3,4).

Furthermore, one study has demonstrated a peanut sensitization rate of 6.8% in a group of adults positive to one or more RAST tests (6). It must be noted that this group consisted of atopic people similar to those in groups 2 and 3 of this study, where the figures for sensitization were respectively 8.6% and 4% (Table 5). The mean of these estimates is therefore consistent with the referenced study.

Is it possible to assess the possible prevalence of peanut allergy in France from the estimated prevalence of sensitization? This is to question the relationship between sensitization and clinical allergy. Only one study, in children, suggests a 3.3 ratio between sensitization and allergy. If we hypothesize that this is true for adults, peanut allergy could affect 190,000 to 454,000 people, indicating a prevalence of 0.3% to 0.75%. It is currently estimated at 0.8% in the US (7), 1% in the UK (4) and 1.5% in Canada (5).

Our estimates, made by 87 allergologists who followed identical procedures over the same period, are very similar to those found in the literature. This argues in favour of using this methodology to carry out allergological enquiries, as well as the standard epidemiological studies that are much more complicated to implement and last much longer.

A future objective of the Allergo-Vigilance Network could be to monitor the progress of what is often a very severe food allergy by a more specific enquiry into the exact ratio between sensitization and allergy to peanut in a test population.

Et les membres du Réseau d'Allergo-vigilance ayant participé à cette étude : Docteurs : A Aissaoui, P Auriol, C Azuelos, L Banoun, A Beeker, A Benyouness, F Blonde-Vincent, M Bouhey, M Boulègue, V Bourdois, K Breuil, A Broue-Chabbert, M Buard, R Cathelineau, A Cheynel, JM Cuny, D De Boissieu, MF Defrance-Hutinet, R Delageneste, F Delepouille, A Delmas, C Deluze, JM Devoisins, C Douillet, P Dron, M Dron-Gonzalez, E Drouet, C Ducrot, MF Fardeau, J Flabbee, P Frentz, C Gallen, J Gayaud, B Gosselin-Decker, JL Grand, L Guénard-Bilbaud, G Haddad, D Histache-Ferreyre, B Hofmann, AM Jonathan, MP Kraus, S Lafosse-Marin, C Lebet, F Le Pabic, F Leprince, F Malauzat, C Marotel, YP Massabie, H Masson, R Mazeyrat, V Mercier-Plotton, J Miltgen, M Monsigny, R Navarro-Rouimi, J Neree, C Nootens, MN Nozick, B Omarjee, F Payot, N Petit, F Pirson, D Poidevin, H Pouvreau, F Queron-Rabier, F Rancé, MC Saint-Cast, F Saint-Martin, N Saxe, P Scherer, P Schramm, D Schwender, I Sullerot, B Taillefer, G Talhovanne, MH Thierry, C This-Vaissette, X Vanderbrempt, D Vidal, MC Vieren, MV Vodoff, B Wallaert, H Zana,

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