

Oral Rush Desensitization in Peanut Allergy: A Case Report

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Allergy to peanuts represents one of the most severe food allergies, rarely remitting compared with milk and egg allergy and frequently associated with life-threatening allergic reactions (1, 2). Its prevalence in the United States is 1.1% (3). Clinical manifestations range from vomiting, diarrhea, and local or generalized urticaria–angioedema to dyspnea, hypotension, collapse, and anaphylactic shock (4). Ara h1, Ara h2, and Ara h3 have been identified as the major peanut allergens (5).

Currently prolonged strict avoidance represents the only effective means to prevent allergic symptoms, but this is hardly feasible. Peanut-allergic patients are particularly vulnerable to accidental exposure because small traces (doses as low as 100 μ g of protein) may provoke severe symptoms (6, 7). Results of peanut allergen monitoring showed a remarkable quantity of products (such as snacks, cereal bars, and potato snacks) with hidden allergen (8). Another study has shown how simple tasks such as shopping and eating in restaurants can be extremely frightening, even perceived as life-threatening (9).

We report the case of a woman with peanut allergy who successfully underwent specific rush desensitization by the oral route (10–14).

CASE REPORT

We present the case of a 38-year-old woman with a 10-year history of abdominal pain, diarrhea, and bloating a few

minutes after the ingestion of peanuts and peanut-containing foods.

She underwent an accurate allergological evaluation. Skin tests were positive to peanut commercial extract and roasted food (prick-by-prick method), and peanut-specific IgE were 2.13 kU/L, class 2 (UniCAP System; Pharmacia, Uppsala, Sweden) (Figure 1). Serum levels of total IgE (105 kU/L; UniCAP System), specific IgG4 (<150 μ g/L; Pharmacia, CAP-FEIA), and ECP (4.84 μ g/L; UniCAP System) were normal.

A food challenge was performed, according to the protocol we usually employ, by administering, every 30 min, increasing doses of roasted peanut (0.05, 0.5, 1, 5, 10, and 20 g), in 2 days, with a 3-day interval. Provocation was stopped when adverse reactions were observed or the highest dose was reached. The food challenge was considered positive if we observed urticaria–angioedema or itching erythema; rhinitis, rhinorrhea or nasal obstruction, or bronchial asthma; vomiting and/or diarrhea with abdominal pain; or general malaise, collapse, or loss of consciousness. Our patient manifested abdominal pain, diarrhea, bloating, and headache at the threshold dose of 5 g (five nuts).

When the diagnosis of IgE-mediated allergy to peanut was confirmed, our patient underwent a specific oral desensitization to peanut (Table 1): 50 g of roasted peanut was whisked, and water was added to a final volume of 150 ml (final solution: 330 mg/ml).

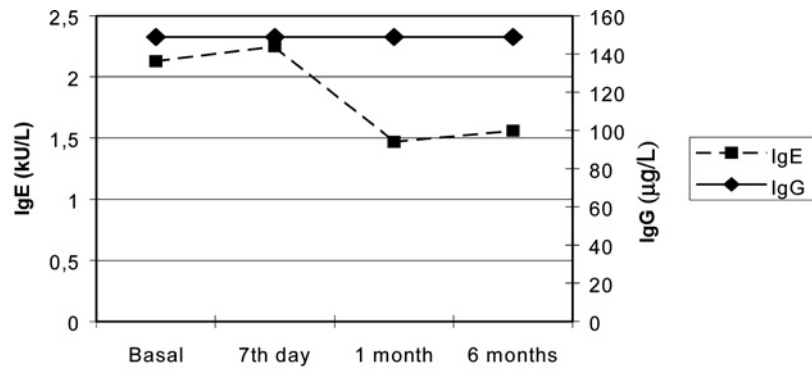
After obtaining approval from the hospital's Ethic Review Board and patient informed consent, the desensitizing treatment started. A 7-day hospitalization was required during the rush phase. Desensitization was performed with increasing doses of peanuts every 20 min, starting with an initial dose of 1 ml of the pure solution diluted 1:10⁷ and reaching the maximum dose of 2.5 ml of the pure solution (825 mg of peanuts) on day 4. Then the desensitization continued with peanuts, starting with the ingestion of one nut (1 g) on day 4 and reaching a final dose of 40 g on day 7 (Table 1).

When the desensitization was completed, maintenance therapy (40 peanuts three times a week) was recommended. Our patient took antihistamine medication (loratadine, 10 mg/day, and ranitidine, 300 mg/day) during the rush phase and for 2 weeks during the maintenance phase. She did not manifest side effects.

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	Basal	1 month	6 months
Skin prick test (peanut extract)	+ wheal 6 mm	± wheal 3 mm	- wheal 0 mm
Prick-by-prick (peanut)	+ wheal 7 mm	± wheal 4 mm	- wheal 0 mm

Fig 1. Immunological modifications (serum specific IgE and IgG4, skin tests) during 6-month follow-up.

TABLE 1. PROTOCOL OF PEANUT-SPECIFIC DESENSITIZATION

Days	Peanut preparation	Dilution	Dose (every 20 min)	Total daily amount
1	Peanut solution (0.33 g/ml)	From 10^{-7} to 10^{-4}	1 ml of each solution	5.6 mg
		10^{-3}	1 ml 2 ml 4 ml	
2	Peanut solution	10^{-2}	1 ml 2 ml 4 ml	168.3 mg
		10^{-1}	1 ml 1.5 ml 2 ml	
3	Peanut solution	10^{-1}	3 ml 4 ml 6 ml 8 ml	1.4 g
		Pure	1 ml 1.3 ml	
4	Peanut solution	Pure	1.6 ml 2 ml 2.5 ml	6.5 g
	Peanuts (1=1 g)		1 1½ 2	
5	Peanuts		2 3 4 5 6	20 g
6	Peanuts		5 7 8 9 11	40 g
7	Peanuts		40	40 g

One month after the rush phase, specific IgE showed a slight decrease (1.47 kU/L, class 2), while IgG4 did not vary. After 6 months skin tests became negative, with no further modification of serum parameters (Table 1).

DISCUSSION

Since complete avoidance of peanuts is unrealistic, some protocols of desensitization to peanuts have been developed (15, 16). A preliminary study performed in 1992 in the United States (where peanut-containing foods are widely consumed) demonstrated the partial efficacy of injection therapy with peanut extract in three peanut-allergic patients. Nelson *et al.* confirmed these data in 1997. Both studies provided a future line of study for the management of peanut allergy, but the rate of systemic reactions was high, even during maintenance injections.

On the basis of the successful results obtained with oral desensitization in the management of allergy to other foods, we developed a new original protocol of desensitization to peanuts (10–14). This treatment was perfectly tolerated. Besides the immunological modifications (decrease in skin test results and serum peanut-specific IgE after the desensitization), our patient developed a clinical tolerance of peanuts: at present she eats 40 g of peanuts three times weekly without problems, as maintenance therapy. Furthermore, she perfectly tolerates peanut-containing foods.

Our study shows the safety and effectiveness of our protocol of oral rush desensitization, even though our patient's clinical manifestations were not particularly severe (only gastrointestinal symptoms). Advantages are the autoadministration during the maintenance phase and the rapid occurrence of tolerance without side effects. Moreover, the protocol is easily feasible and materials are available at a low cost. This protocol requires a short hospitalization and adequate patient compliance.

Even though further studies on a larger group of patients are needed, our encouraging results may have an impact on the quality of life of peanut-allergic patients, who can enjoy again the pleasures of life such as eating in restaurants, kissing their lovers, or playing cards without (allergy-related) life-threatening consequences (9, 17, 18).

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