

Cockroach allergen: an important cause of perennial rhinitis

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Hypersensitivity to cockroach allergen has been previously reported (1, 4, 7). In some publications, cockroach allergen caused immediate skin reactions (2) as well as immediate bronchoconstriction (3), while others observed a dual skin and airway effect (5). In the reports which have appeared so far, cockroach was not the only identified allergen to induce symptoms, and most of the patients were exposed to large amounts of cockroaches, such as in crowded and poor neighbourhoods (8).

In the following report, we describe a unique group of patients who had only perennial rhinitis and were sensitive to cockroach allergen only.

SUBJECTS AND METHODS

Nine patients (5 male and 4 female, aged 9 to 28 years) referred for evaluation of perennial rhinitis, were seen during 1982-1987 at the Allergy Clinic of Ichilov Hospital. These patients represented nine (0.5%) of 1820 new patients seen at our clinic during the same period for evaluation of respiratory allergy.

All the patients were skin tested with 28 different allergens (dust, *Dermatophagoides farinae*, grass pollens, weeds, trees, animals, molds and cockroach), histamine and 0.9% saline which were obtained from Hollister Stier. Skin tests were done by the prick meth-

od at a concentration of 1:20 w/v, and were repeated twice. Patients who were skin sensitive by prick also had an intradermal skin test with 0.05 cc histamine diphosphate (0.01 mg/ml), cockroach allergen (containing American and German cockroach) (1:1000) and 0.9% saline control.

To confirm skin test results all patients underwent nasal provocation (NP) by drops into the inferior turbinate. Following 0.9% NaCl, increasing concentrations of cockroach allergen were introduced intranasally (0.1 cc, by drops), (1:100,000, 1:10,000, 1:5,000, 1:1,000, 1:100 w/v) at 20-min intervals.

Watery nasal discharge lasting at least 5 min was considered significant, and the doses inducing this symptom were recorded.

RESULTS

Table 1 gives a summary of the patients' characteristics. All patients had symptoms of watery nasal discharge, sneezing and itchy nose, usually early in the morning and in the evening. Symptoms cleared while outdoors. House dust (during vacuum cleaning, or from carpets) induced symptoms. On physical examination none of the patients had nasal polyps, and the nasal mucosa was bluish in colour.

Prick test showed all patients to have a positive skin response to house dust and cockroach allergens. None of the other allergens produced either wheal or erythema. Table 2 summarizes the skin response to cockroach allergen done by the prick and ID methods. The latter method induced large skin response in all patients at 15 min, but only five had late response at 4 h. Nasal provocation with cockroach allergen induced swelling of the nasal mucosa in the nostril concerned, as well as watery discharge. The doses inducing such response are presented in Table 2. Six of the patients received mite intra-nasally, but no nasal symptoms were observed.

Table 1
Patient characteristics

No.	Age (years)	Sex	Duration of illness (years)	Therapy
1	10	M	4	Becl. inh.
2	18	M	9	Becl. inh.
3	23	F	5	Ast.
4	12	M	2	Becl. inh.
5	29	M	5	Ast.
6	17	F	3	Ast.
7	9	F	3	Becl. inh.
8	31	F	10	Becl. inh.
9	26	M	2	Becl. inh.

Becl. inh. = Beclomethasone (inhaled); Ast. = Astemizole; M = male; F = female.

Table 2
Patients' response to cockroach allergen

No.	Prick (mm)	Intradermal (mm)		Nasal prov. conc. in w/v of symptoms
		20 min	4 h	
1	8 × 7	10 × 15	22 × 30	1: 10,000
2	4 × 5	9 × 12	18 × 10	1: 10,000
3	3 × 9	10 × 7	–	1: 5,000
4	4 × 6	15 × 11	26 × 11	1: 10,000
5	9 × 5	8 × 6	–	1:100,000
6	10 × 4	11 × 13	–	1: 10,000
7	7 × 7	10 × 9	12 × 14	1: 5,000
8	4 × 7	9 × 4	–	1: 10,000
9	8 × 6	12 × 13	15 × 18	1: 5,000

DISCUSSION

Cockroach is a well-defined allergen generating respiratory allergy (1, 4, 7). The diagnosis of cockroach allergy can be well established by skin prick test or specific IgE (6). It has been frequently described among patients with bronchial asthma, and bronchial inhalation was pre-ported to induce both immediate and late bronchial response.

In this brief communication, we describe a unique group of patients who had perennial rhinitis and in whom cockroach was the only allergen found among 28 test allergens. All patients demonstrated nasal symptoms following provocation with the allergen, confirming our skin results. To confirm skin test results, mite was introduced intra-nasally in six of the patients, without inducing nasal symptoms. Thus, it appears likely that these patients have a single cause for their rhinitis – cockroach. In addition, five of the nine patients also showed a dual skin response with the late phase measured 4 h after the intradermal test. These results probably also indicate late nasal response.

In the few papers described so far, the authors stress that cockroach allergy is more prevalent among patients who are heavily exposed to cockroaches, such as occurs in poorer neighbourhoods (8). The majority of our patients (seven), had a high standard of living, and denied exposure to cockroaches. Since most houses in the urban areas of Israel have some cockroaches, one could assume that our patients were genetically more susceptible than others to a cockroach allergy. The significance of this report is to emphasize the need for routine skin tests with cockroach allergen, even when the patient is not a good candidate. Further, since cockroach exposure cannot be completely avoided, immunotherapy should be considered in these patients.

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