

CORRELATION BETWEEN *DERMATOPHAGOIDES* *PTERONYSSINUS* AND *DERMATOPHAGOIDES* *FARINAE* IN HOUSE DUST MITES IN CHRONIC URTICARIA^{*}

By

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- (Received June 22, 1981)

ABSTRACT

One hundred and thirty-eight patients with chronic urticaria were tested intradermally with *Dermatophagodes pteronyssinus* and *Dermatophagoides farinae allergens*. None had any past history of other atopic diseases. The percentage of cases which gave positive skin reactions to these mite allergens was larger in chronic urticarial patients than in normal healthy subjects. A significant correlation was observed between the magnitude of skin reactions to *D. pteronyssinus* and to *D. farinae*. The results suggest that *D. pteronyssinus* and *D. farinae* may play a role in chronic urticaria and that there may be cross allergenicity between *D. pteronyssinus* and *D. farinae*.

INTRODUCTION

It is well known that a mite is one of the important allergens in respiratory allergy. In previous studies, we demonstrated that mite may also have an important role in chronic urticaria¹⁻³⁾. The percentage of 2+ or 3+ skin reaction to mite allergen was markedly higher in chronic urticarial patients than in normal healthy subjects²⁾. In the previous investigations, the extract from *Dermatophagodes farinae* was used as a mite allergen for skin test. Kabasawa *et al.* showed that *Dermato-*

phagoides pteronyssinus is also an important allergen in respiratory allergy in Japan⁴⁾.

In the present study, therefore, in order to investigate the role of *D. pteronyssinus* and correlation between skin reactivity to *D. pteronyssinus* and to *D. farinae* in chronic urticaria, skin test using these allergens was performed in 138 patients with chronic urticaria of unidentified causes.

MATERIALS AND METHODS

Patients: One hundred and thirty-eight pa-

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tients (ages 3 to 82) of both sexes with chronic urticaria were randomly selected for the present investigation. The cause was not identifiable from the histories. None had any past history of other atopic diseases, such as allergic bronchial asthma, allergic rhinitis or atopic dermatitis. The diagnosis of chronic urticaria was established on clinical grounds, the duration being not less than three months.

Allergens: *D. farinae* allergen was supplied by Torii Pharmaceutical Company (Tokyo). *D. pteronyssinus* allergen was prepared from cultured *D. pteronyssinus* by the method of Ishii et al⁵⁾. The concentrations of *D. pteronyssinus* and *D. farinae* allergens for skin tests were 2.5 µg/ml and 7.7 µg/ml respectively.

Skin test: Skin tests were done on the inner surfaces of the forearms by injecting intradermally 0.02 ml of an allergen solution. The reactions were read 15 minutes after injection. Skin test grading was based on measurement of the diameter of the wheal using the following criteria: negative, no difference from a diluent control; 1+, ≤9 mm wheal; 2+, 10 to 14 mm wheal; 3+, ≥15 mm wheal. The magnitude of skin reactions to *D. pteronyssinus* and *D. farinae* allergens was compared in the same individual.

RESULTS

Incidence of skin reactions to *D. pteronyssinus* and *D. farinae* allergens in chronic urticarial patients: The results of the intradermal skin tests described above are summarized in tables 1 and 2. Of 138 patients, 37 (26.8%) gave positive skin reactions to *D. pteronyssinus* and 68 (40.3%) to *D. farinae*. A significant correlation was observed between the magnitude of skin reactions to *D. pteronyssinus* and to *D. farinae* ($r=0.5254$, $p<0.001$). However, the number of cases which gave positive reactions to *D. farinae* was larger, compared with the number which gave positive reaction to *D. pteronyssinus*.

In a few cases, differences in skin responses to these allergens were observed. For example, 12 out of 31 cases which gave 2+ skin reaction to *D. farinae* gave negative reaction to *D. pteronyssinus*. On the other hand, of 35 cases with 1+ skin reaction to *D. farinae*, 4 gave 2+ skin reaction to *D. pteronyssinus*. Similar

Table 1. Incidence of skin reactions to *D. pteronyssinus* and *D. farinae* in 138 chronic urticarial patients

Skin test	Number of cases	
	<i>D. pteronyssinus</i>	<i>D. farinae</i>
3+	1	2
2+	11	31
1+	25	35
neg.	101	70

Table 2. Correlation between the magnitude of skin reactions to *D. pteronyssinus* and to *D. farinae* in 138 chronic urticarial patients

Skin test		Number of cases
<i>D. pteronyssinus</i>	<i>D. farinae</i>	
3+	3+	1
3+	2+	0
3+	1+	0
3+	neg.	0
2+	3+	0
2+	2+	7
2+	1+	4
2+	neg.	0
1+	3+	1
1+	2+	12
1+	1+	6
1+	neg.	6
neg.	3+	0
neg.	2+	12
neg.	1+	25
neg.	neg.	64

results were also observed in the other skin tests.

Incidence of skin reactions to *D. pteronyssinus* and *D. farinae* allergens in normal healthy subjects: In the previous study, some of the normal healthy subjects gave positive skin reaction to *D. farinae*, although the percentage of cases with positive skin reactions was markedly smaller in the normal healthy group than in the chronic urticarial group²⁾. To confirm the specificity of the positive skin reaction to *D. pteronyssinus* in chronic urticarial patients, skin test using this allergen was performed in 64 normal healthy subjects.

Table 3. Incidence of skin reactions to *D. pteronyssinus* and *D. farinae* in 64 normal healthy subjects

Skin test	Number of cases	
	<i>D. pteronyssinus</i>	<i>D. farinae</i>
3+	0	0
2+	3	3
1+	8	10
neg.	53	51

Table 4. Correlation between the magnitude of skin reactions to *D. pteronyssinus* and to *D. farinae* in 64 normal healthy subjects

Skin test		Number of cases
<i>D. pteronyssinus</i>	<i>D. farinae</i>	
3+	3+	0
3+	2+	0
3+	1+	0
3+	neg.	0
2+	3+	0
2+	2+	2
2+	1+	1
2+	neg.	0
1+	3+	0
1+	2+	1
1+	1+	5
1+	neg.	2
neg.	3+	0
neg.	2+	0
neg.	1+	4
neg.	neg.	49

The results are summarized in tables 3 and 4. Of 64 cases, positive skin reactions to *D. pteronyssinus* were obtained in 11 (17.2%) and to *D. farinae* in 13 (20.3%). A significant correlation was observed between the magnitude of skin reactions to *D. pteronyssinus* and *D. farinae* ($r=0.6847$, $p<0.001$). The percentage of cases which gave positive skin reactions to these allergens was larger in the chronic urticarial group than in the normal healthy group, as previously reported⁹.

DISCUSSION

It has been well established that *D. pteronyssinus*

and *D. farinae* are important allergens in house dust allergy in Japan^{4,6}. Our previous study indicated that there is a significant correlation between house dust skin sensitivity and skin sensitivity to *D. farinae* in chronic urticarial patients².

In the present study, the percentage of cases which gave positive skin reaction to *D. pteronyssinus* allergen was higher in the chronic urticarial group than in the normal healthy group; this suggests that *D. pteronyssinus* may also play a role in chronic urticaria. A few normal individuals gave positive skin reactions to *D. pteronyssinus* and *D. farinae* at a similar percentage. Moreover, a significant correlation was observed between the magnitude of the skin sensitivity to *D. pteronyssinus* and to *D. farinae* in the chronic urticarial group and in the normal healthy group.

Cross allergenicity among mite species has been recognized in human skin tests. Bernecker showed cross reactions among several mite species in the prick test⁷. In addition, Dasgupta and Cunliffe demonstrated the presence of at least one, and probably two, antigens common to *D. pteronyssinus* and *D. farinae*⁸. These facts may reasonably explain why the skin reactivity of individuals to these mite allergens was very similar in the present investigation. One can not exclude the possibility, however, that the individuals may be sensitized simultaneously with different specific allergens of *D. pteronyssinus* and *D. farinae*. In a few cases, differences in skin reactions to *D. pteronyssinus* and *D. farinae* were clearly observed. This may be explained by the fact that *D. pteronyssinus* and *D. farinae* have specific antigens respectively⁹.

In the present investigation, the percentage of cases which gave positive skin reactions to *D. pteronyssinus* was smaller than that of the cases with positive skin reactions to *D. farinae*. This may be due to the difference in concentrations of the mite allergens used in the present study.

The present results suggest that *D. pteronyssinus* may play a role, as well as *D. farinae*, in chronic urticaria and that there may be cross allergenicity between *D. pteronyssinus* and *D. farinae*.

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