

# Type I Allergy to Foods in Atopic Dermatitis

## Comparison between RAST-positive and RAST-negative cases

MASAMI UEHARA, CHIKAKO KIMURA and TOSHIAKI UENISHI

Department of Dermatology, Shiga University of Medical Science, Otsu, Japan

**Radioallergosorbent tests (RASTs) with five common foods were performed in 183 patients with atopic dermatitis. The results showed that about half of the patients had type I allergy to at least one of the five foodstuffs. The RAST results correlated roughly to the severity of dermatitis. In each group of patients with mild, moderate and severe atopic dermatitis, positive RAST reactions to common foods occurred predominantly in patients who had a personal or a family history of respiratory atopy. Positive RASTs were rare in patients with pure atopic dermatitis who had neither personal nor family history of respiratory atopy. It seems likely that type I food allergy occurs predominantly in those patients with atopic dermatitis who have a predisposition to respiratory atopy. Key words: Food allergy; RAST; Disease severity; Atopic family history.**

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M. Uehara, Department of Dermatology, Shiga University of Medical Science, Tsukinowa-cho, Setu, Otsu, 520-21, Japan.

The role of type I allergy to foods in the aggravation of atopic dermatitis (AD) is a matter of controversy. In recent years many authors (1-5) report that challenge tests with the allergenic foods do not always provoke an aggravation of the skin lesions.

A feature of food allergy is that although all patients with AD are equally exposed to food allergens, only a limited number of the patients develop type I allergy to foods. This would suggest that patients with AD are not homogeneous in their capacity to develop type I food allergy. At present it is not clear what the factors may be that are related to the development of the food allergy. To clarify this problem, we examined whether type I allergy to foods is related to clinical course, disease severity, or familial background of respiratory atopy.

### PATIENTS AND METHODS

#### Selection of patients

A total of 183 patients with AD were evaluated. They ranged in age from 15 to 30 years. A previous study (6) reported that the incidence of atopic family history reached a reliable level only in those patients who had five family members or more. In the present study, therefore, we examined consecutive patients with AD who had five family members (i.e., the patient, parents, and two siblings).

With regard to clinical course, seasonal fluctuation of skin lesions occurred in 109 patients, and perennial worsening of dermatitis was seen in 74 patients.

The patient population consisted of 42 cases of mild AD (involvement of less than 10% of the total body surface), 100 moderate cases (presence of skin lesions in 10% to 70% of the body surface), and 41 severe cases (involvement of more than 70% of the body surface).

According to the personal and family histories of respiratory atopy, the patients were classified into three groups: 1) those who had a

personal history of respiratory atopy (86 cases); 2) those who did not have personal history of respiratory atopy, but had a family history of respiratory atopy (50 cases); and 3) those who had neither a personal nor a family history of respiratory atopy (47 cases).

#### Assays for specific IgE

Specific IgE antibodies to five common foods in Japan (milk, eggs, soybean, wheat and rice) were measured by the radioallergosorbent test (RAST, Pharmacia, Uppsala, Sweden). The results were expressed in RAST scores that ranged from 0 to 4. A score of 2 was interpreted as positive. We then tried to ascertain whether the RAST results correlated to the clinical course, severity of dermatitis, and personal or family history of respiratory atopy. Significant differences between groups were calculated by using  $\chi^2$ -test.

### RESULTS

Of the 183 patients with AD, 93 (51%) showed positive RAST reactions to at least one of the five common foods. RAST results to each food stuff are given in Table I. Rice was the predominant food allergen, followed by wheat, and soybean.

Table II compares RAST reactions to rice between patients who showed seasonal fluctuation of dermatitis and patients who had perennial worsening of skin lesions. The prevalence of positive RAST responses to rice did not differ between patients with seasonally fluctuating dermatitis and those with perennially worsening dermatitis. Nor did RAST results to wheat and soybean differ between patients who showed seasonal fluctuation of dermatitis and patients who had florid dermatitis throughout the year (data not shown).

RAST results to rice in patients with mild, moderate and severe AD are given in Table III. Positive RAST reactions were obtained in 21% of mild cases, and in 54% of severe cases. This difference was significant ( $p < 0.01$ ). However, nearly a half of the severe cases showed negative RAST reactions to rice. RAST values to wheat and soybean also roughly correlated with the severity of dermatitis (data not shown).

In each group of the mild, moderate and severe AD, positive RAST reactions to rice occurred mostly in patients with AD who had a personal or family history of respiratory atopy,

Table I. Prevalence of positive RAST reactions in 183 patients with atopic dermatitis in Japan

	RAST reactions		% of positive RAST
	Positive	Negative	
Milk	7	176	4%
Eggs	18	165	10%
Soybean	36	147	20%
Wheat	50	133	27%
Rice	69	114	38%

Table II. Comparison of RAST reactions to rice between patients with atopic dermatitis who showed seasonal fluctuation of skin lesions and patients with atopic dermatitis who had perennial worsening of dermatitis

	No. of patients	RAST to rice		% of positive RAST
		Positive	Negative	
Patients showing seasonal worsening of dermatitis	109	38	71	35%
Patients having perennial worsening of dermatitis	74	31	43	42%

as shown in Table IV. The positive RAST values were seen only rarely in patients with "pure" AD who had neither a personal nor a family history of respiratory atopy. Similarly, positive RAST reactions to wheat and soybean occurred predominantly in patients with AD who had a personal or family history of respiratory atopy (data not shown).

## DISCUSSION

In the present study of 183 adult patients with AD in Japan, type I allergy to common foods was observed in about half of the patients. The predominant food allergen was rice. These results are substantially in agreement with the findings of previous studies (7, 8).

Common foods are amply eaten by all patients throughout the year. We then examined whether type I allergy to common foods occurs mainly in patients with AD who have perennial worsening of dermatitis. The prevalence of positive RAST reactions to common foods, however, did not differ between patients who had perennially worsening dermatitis and patients who showed seasonal fluctuation of skin lesions. This finding would appear to indicate that type I food allergy does not play an important role in exacerbating AD.

Our data confirm the observation that incidence of type I allergy to foods roughly parallels the severity of AD (8, 9). However, there were many exceptions. A considerable number of patients with severe AD consistently showed negative RAST responses to common foods, while patients with mild AD often had positive RAST reactions. Thus, it appears that the severity of disease is not the main factor for development of type I food allergy.

Table III. Prevalence of positive RAST reactions to rice in patients with mild, moderate, and severe atopic dermatitis

	No. of patients	RAST to rice		% of positive RAST
		Positive	Negative	
Mild cases	42	9	33	38%
Moderate cases	100	38	62	21%
Severe cases	41	22	19	54%

Table IV. Relation between RAST values to rice and personal or family history of respiratory atopy in patients with mild, moderate, and severe atopic dermatitis

	Prevalence of positive RAST to rice		
	Mild cases	Moderate cases	Severe cases
Patients with AD and personal history of respiratory atopy	24%(4/17)	53%(26/49)	70%(14/20)
Patients with AD and family history of respiratory atopy	31%(5/16)	39%(9/23)	64%(7/11)
Patients with "pure" AD	0%(0/9)	11%(3/28)	10%(1/10)

By classifying patients with AD into three groups on the basis of personal and family history of respiratory atopy, the present study further demonstrates that development of type I food allergy is associated with both a personal and family history of respiratory atopy. In each group of mild, moderate, and severe AD, positive RAST responses to common foods occurred mostly in patients who had a personal or family history of respiratory atopy. Positive RAST reactions were only rarely seen in patients with "pure" atopic dermatitis who had neither a personal nor a family history of respiratory atopy. It is known that there are some patients with solely AD who have a family history of AD, but do not have a family history of respiratory atopy (6, 10). In the present study, patients with "pure" AD comprised 26% of the total patients with AD who were examined.

In summary, we may conclude that type I allergy to foods occurs predominantly in patients with atopic dermatitis who have a predisposition to respiratory atopy. This type of food allergy seems to be rare in patients with "pure" atopic dermatitis.

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