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Immunoglobulin E in Psoriasis Evaluated by Paper Radioimmunosorbent and Paper Enzyme-immunosorbent Tests

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Serum IgE concentrations were determined by the paper radioimmunosorbent test in 56 patients with psoriasis and 50 normal controls, and by the paper enzyme-immunosorbent test in 32 of these patients and 50 controls. Elevated IgE levels were found in 26 (46%) of 56 patients with psoriasis and in 1 normal control (2%). The mean value (208 U/ml) in 56 patients was significantly higher than in normal controls (31 U/ml). Thirteen of 19 patients (68%) with extensive involvement (>20% body surface) had an increased IgE level; the mean value (365 U/ml) was 4 times greater than in 17 patients with limited lesions (89 U/ml) and 12 times higher than in 50 normal controls (31 U/ml). No correlation was found between serum IgE levels and the presence of psoriatic arthritis. Both paper radioimmunosorbent and paper enzyme-immunosorbent testing produced similar results. *Key words: Immunoglobulin E; Radioimmunoassay; Enzyme immunoassay.* (Received May 2, 1984.)

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A number of studies have been done to determine possible disturbances of cellular and humoral immunological function in patients with psoriasis (1, 2, 3). Data on IgE levels in psoriasis are conflicting (4, 5). To our knowledge, a systematic study of serum IgE on a large group of psoriasis patients with limited or extensive involvement and normal healthy adults has not been done.

In this study, serum IgE levels in 56 psoriasis patients and 50 controls were determined. The results of IgE tested by paper radioimmunosorbent testing, and paper enzyme-immunosorbent testing were compared in 32 patients and 50 normal controls. A comparison of IgE levels has been made in patients with extensive and with limited skin involvement.

MATERIALS AND METHODS

Subjects

Serum IgE levels were determined in 56 patients with psoriasis, 36 of whom were thoroughly evaluated by history, clinical examination and laboratory data analysis. There were 44 Caucasian and 12 black patients, 26 men and 30 women. Ages ranged from 16 to 76 years with mean age of 42.3. Patients with diseases known to be associated with increased serum IgE levels, i.e. atopic disorders and parasitic infestations, were excluded from this group. According to the extent of body surface involvement, 36 patients were divided into two subgroups: 1) those with skin lesions involving more than 20% of the body surface (n=19), and 2) those with less than 20% of the body surface involved

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(n=17). Another 20 patients with psoriasis in whom skin surface involvement and other fctors were not evaluated, were also included in this study. Six of the 36 patients had a history of drug reaction, but none had a reaction during the study period. These 6 patients did not have a history of any other allergic disorders. Four of the 36 patients had psoriatic arthritis. The sera of 50 normal healthy adults were also measured for IgE levels. The sera from both patients and controls were stored at −70°C prior to study.

Immunoglobulin E measurement

Serum IgE quantitations were performed by the paper radioimmunosorbent test (Phadebas®) and the paper enzyme-immunosorbent test (Phadezyme®) (Pharmacia, Piscataway, N. J.) according to the instructions of the manufacturer. Serum IgE level above 122 U/ml was considered as abnormal.

Data analysis

In order for the assumptions necessary for the analysis of variance to be met, a log transformation of the original data was made prior to any statistical analyses. Tests of significance were all made on the transformed scale and the results presented on the original scale.

RESULTS

The results of IgE obtained by the paper radioimmunosorbent test were used for subsequent comparative analysis since the serum IgE concentrations detected by the paper radioimmunosorbent test and paper enzyme-immunosorbent test were similar (Table I, Fig. 1). The mean serum IgE level was significantly higher in 56 patients with psoriasis (208 U/ml) than in normal controls (31 U/ml) (Table II) (p=0.00001). Of the 50 healthy adult controls, only 1 (2%) had a borderline elevated IgE level (129 U/ml), but 26 (46%) of 56 patients with psoriasis had an elevated IgE.

When average IgE concentrations were compared between the group with extensive lesions and the group with limited lesions, the difference was striking (365 U/ml vs. 89 U/ml: 4.1 to 1) (p=0.002). In the group with limited lesions, the mean value was higher (89 U/ml) than normal controls (31 U/ml: 2.9 to 1); 18% of this group had increased IgE levels and the highest was 490 U/ml. In contrast, 13 out of 19 patients (68%) with extensive psoriasis had elevated IgE levels; 5 patients (26%) had IgE concentrations of 900 U/ml or more. The average serum IgE level in the patients with extensive lesions was 12 times higher than in the normal control group. There was no difference for mean IgE levels between Black and Caucasian, different age groups and sexes in the 3 subgroups of patients.

Table I. *IgE value by paper radioimmunosorbent test in 56 patients with psoriasis and 50 healthy adult controls*

	IgE level in all patients				Patients with an elevated IgE	
	Patient number	IgE range[a]	Mean value	SD[b]	Patient number	%
Skin involved <20% body surface	17	2–490	89	±132	3	18
Skin involved >20% body surface	19	4–1 000	365	±385	13	68
Without evaluation of skin involvement	20	2–940	161	±203	10	50
All patients	56	2–1 000	208	±285	26	46
Healthy adult controls	50	0–129	31	±29	1	2

[a] U/ml.
[b] Standard deviation.

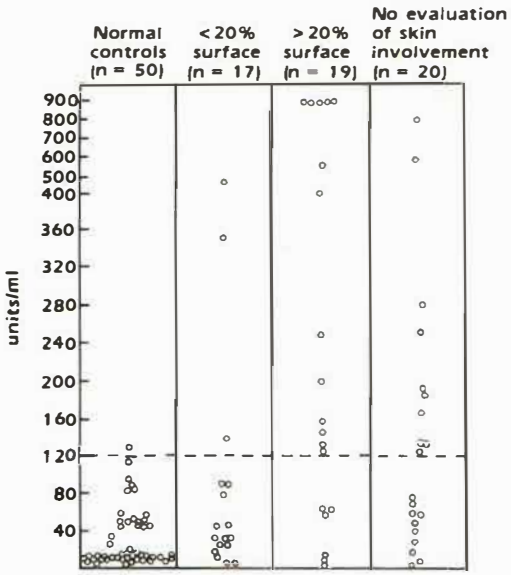

Fig. 1. Distribution of serum IgE levels in 56 psoriasis patients and 50 healthy adult controls. Patients with IgE value more than 900 U/ml were also considered as having 900 U/ml. Performed by paper radioimmunosorbent test.

Of 4 patients with psoriatic arthritis (with 2 patients in the extensive lesion group and 2 in the limited lesion group), 1 patient had an elevated IgE level (200 U/ml). The mean values of IgE in patients with or without a history of a drug reaction were not significantly different (Table III).

DISCUSSION

An increased serum IgE level was found in 46% of 56 patients with psoriasis and 2% of 50 normal healthy adults. In addition, the mean value of serum IgE in patients with psoriasis was significantly higher than in normal controls.

The most striking finding was the significantly elevated serum IgE levels in 68% of patients with extensive skin involvement when compared to patients with limited lesions. Twenty-six percent of patients with more than 20% involvement had IgE concentrations of 900 U/ml or more. Increased IgE concentrations were not related to joint involvement as shown by the results in patients with psoriatic arthritis.

Table II. *IgE levels by paper radioimmunosorbent test in patients with or without drug reactions*

	Patients with history of drug reactions		Patients without history of drug reactions	
	Number	Mean value[a]	Number	Mean value
Skin involvement <20% body surface	2	339	17	368
Skin involvement >20% body surface	4	112	13	82

[a] U/ml.

Table III. *Comparison of IgE detected by paper radio or paper enzyme-immunosorbent tests*

	All patients			Patients with elevated IgE			Normal control		
	No.	Mean[a] value	SD[b]	No.	Mean value	SD	No.	Mean value	SD
Paper radioimmuno-sorbent test	32	167	±200	13	353	±194	50	31	±29
Paper enzyme-immuno-sorbent test	32	174	±204	13	365	±198	50	30	±29

[a] U/ml.
[b] Standard deviation.

Previous studies have produced conflicting results. Normal serum IgE levels have been reported by Juhlin et al. (1969), Ogawa et al. (1971) and Gurevitch et al. (1973) (6, 7, 8). Vinje et al. (1980), in a study of 50 patients with psoriasis, reported that serum IgE concentrations of patients did not differ significantly from the controls (5). Guilhou et al. (1976), De Luca et al. (1978), and Negosanti et al. (1981) found an elevated serum IgE levels in some of their patients with psoriasis (2, 4, 9). In this study, of 17 patients with limited skin involvement, 3 (18%) had an increased IgE concentration. Although the mean level of IgE in this group was higher than in normal controls, they were still within the normal range. This finding suggests that the discrepancies among various studies may relate to differences in serum IgE levels among psoriasis patients with a variable degree of skin involvement.

The variations reported on the percentage of patients with high IgE in psoriasis may be also partially due to methodological differences. In the present study, the comparison of serum IgE concentrations measured by the paper radioimmunosorbent test and the paper enzyme-immunosorbent test demonstrated that both methods provide similar results. However, the enzyme immunosorbent test can be performed in most laboratories without radioactive materials and isotope-counting equipment. According to the results of the present study, the paper enzyme-immunosorbent test could satisfactorily replace the paper radioimmunosorbent test and provide equally accurate information.

Our finding of a correlation between the IgE level and severity of psoriatic skin lesions is similar to that found in some atopic diseases. Increased IgE levels are found in most atopic patients, but only patients with eczema without respiratory allergy generally have almost normal IgE levels (10). The reason why an increase of IgE is related to the extent of psoriatic involvement is unknown, but some inflammatory skin diseases have been shown to be associated with increased IgE production. T cells have been demonstrated to exert a suppressor function on IgE production (11). A deficiency of T suppressor cells suggested by some reports in patients with psoriasis may be involved in the excess production of IgE (12, 13), but this remains to be determined.

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