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Antinuclear Antibodies in Patients with Atopic Dermatitis and Severe Facial Lesions

Key Words

Antinuclear antibodies
Atopic dermatitis

Abstract

Background: In adult patients with atopic dermatitis (AD), the presence of autoantibodies such as anti-IgE and antinuclear antibodies (ANA) has been demonstrated. The patients may have altered immune regulation. **Objective:** The purpose of this study is to examine the prevalence of ANA in AD patients with severe facial eruptions and to evaluate the differences between ANA-positive and ANA-negative AD patients. **Methods:** ANA, blood eosinophil count, total serum IgE levels, specific IgE antibody to *Dermatophagoides pteronyssinus*, disease duration, photosensitivity and association with respiratory allergic diseases were checked in 89 AD patients. **Results:** Twenty-three (25.8%) AD patients showed positive ANA at titers ranging from 1:40 to 1:640, and the incidence of positive ANA was 12.1% in controls. Twenty-five (71.4%) of 35 AD patients with positive ANA at titers ranging from 1:20 to 1:640 were females. **Conclusion:** Adult AD patients with severe facial lesions should be examined for serum ANA. Particularly in female and photosensitive AD patients with severe facial lesions, serum autoantibodies have to be carefully investigated to differentiate from autoimmune diseases.

Antinuclear antibodies (ANA) have been well documented in autoimmune disorders such as systemic lupus erythematosus (SLE) [1]. However, it is well known that noncollagen diseases such as viral infections and chronic inflammatory diseases also show positive ANA [2, 3]. In addition, positive ANA during psoralen plus ultraviolet A (PUVA) therapy [4] and in patients with polymorphic light eruption [5] have been reported.

In adult patients with atopic dermatitis (AD), the presence of anti-IgE autoantibodies has been demonstrated [6]; patients with AD associated with facial lesions have also been reported to have ANA more frequently [7] than controls. The titers of ANA in patients with AD are usually low, and their significance remains to be clarified.

In this study we examined the prevalence of positive ANA in AD patients associated with severe facial lesions, and evaluated the differences between ANA-positive and ANA-negative AD patients.

Patients and Methods

AD patients fulfilling the criteria of Hanifin and Rajka [8], and having severe facial lesions, were selected. Eighty-nine patients (40 males and 49 females; mean age 19.0 ± 7.4 years, age range 5–49 years) were enrolled. ANA, blood eosinophil count, total serum IgE levels, specific IgE antibody to *Dermatophagoides pteronyssinus*, disease duration, photosensitivity (decrease in minimum erythema dose for UVA or UVB) tested by Dermalay MDMR-100 (Toshiba, Japan) and association with respiratory allergic diseases such as bronchial

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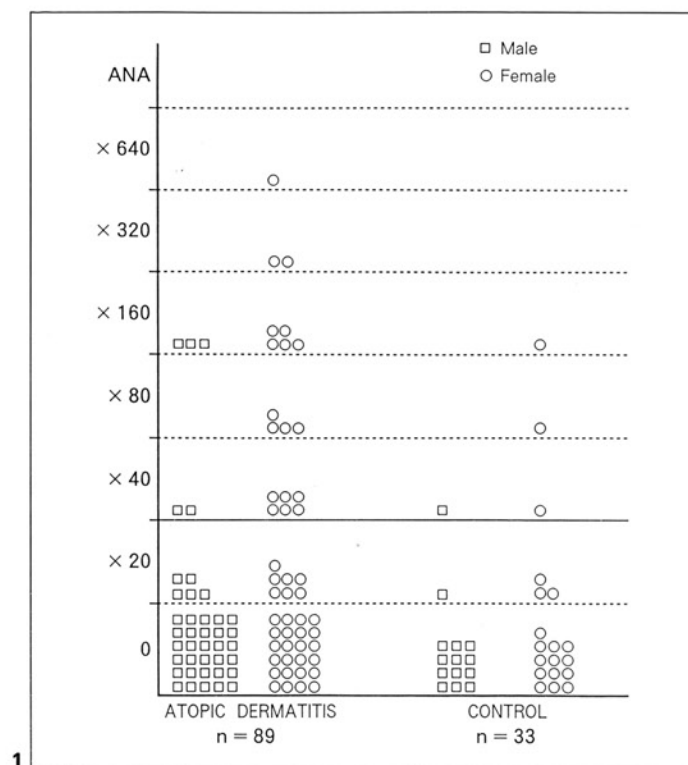
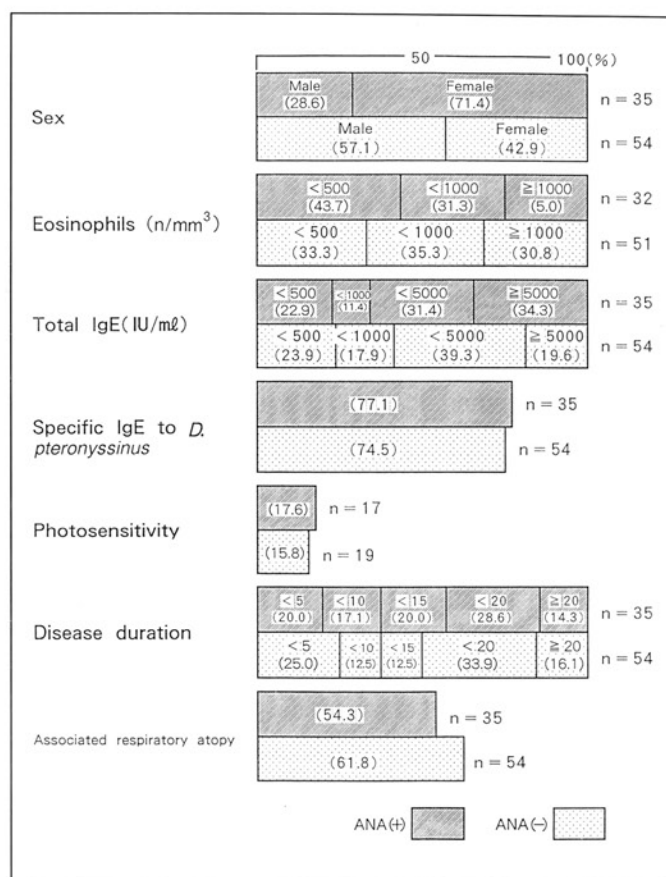


Fig. 1. ANA in AD patients and the control group.

Fig. 2. Comparison of AD patients with positive ANA versus those with negative ANA. Disease duration is indicated in years.



asthma and allergic rhinitis were checked. Control serum samples were obtained from age-matched, skin-diseased patients (14 males and 19 females) with eczematous lesions such as contact dermatitis but without atopic disorders such as allergic rhinitis, asthma or collagen diseases including SLE. Statistical analysis was performed using Wilcoxon's test.

ANA of the IgG subclass were identified by indirect immunofluorescence on HEp-2 cells fixed in acetone, using serum diluted in phosphate-buffered saline and fluorescein-isothiocyanate-conjugated goat antihuman immunoglobulins (MBL, Japan). A titer greater than 1:40 was considered as positive. In the AD patients with positive ANA at titers greater than 1:40, antibodies to double-stranded DNA, SS-A (Ro) and SS-B (La) were searched by enzyme-linked immunosorbent assays and by counterimmunoelectrophoresis, respectively. Total hemolytic complement titers (CH50) were also measured in these patients.

Results

The titers of ANA in the 89 AD patients and the 33 control patients are presented in figure 1. Twenty-three (25.8%) AD patients showed positive ANA at titers ranging from

1:40 to 1:640. The incidence of positive ANA was 12.1% in controls, the difference is not statistically significant. There was no correlation between positive ANA and total serum IgE levels or peripheral eosinophilia in the AD patients. The fluorescence patterns of ANA in the AD patients were: homogeneous in 7, speckled in 22 and of mixed type of both in 6; in control patients they were homogeneous in 1, speckled in 1 and both in 2. None showed a peripheral pattern which is known as specific for SLE. None of our 23 AD patients with positive ANA showed anti-DNA antibody, SS-A/B or decreased complement levels. In addition, they had no clinical criteria of SLE.

We further compared ANA-positive and ANA-negative AD groups for sex, blood eosinophil count, total serum IgE level, specific IgE antibody to *D. pteronyssinus*, disease duration, photosensitivity and associated respiratory atopy (fig. 2). There were no significant differences between the two groups as to eosinophilia, total serum IgE levels, specific IgE antibody to *D. pteronyssinus*, photosensitivity, disease duration and associated respiratory atopy. Twenty-five (71.4%) of 35 AD patients with positive ANA were fe-

males, whereas the female ratio of 54 AD patients with negative ANA was 44.4%. The ratio of females in AD patients with positive ANA was significantly ($p < 0.05$) raised.

Discussion

Some investigators [6, 9] have demonstrated the high prevalence of autoantibodies to IgE in AD patients, and a high incidence of positive ANA in AD patients with facial lesions was reported by Taniguchi et al. [7]. The incidence of positive ANA seemed to be higher when compared to 4–16.1% in normal subjects [10, 11] and 12.1% in our control patients. There was, however, no significant difference between the prevalence of positive ANA in AD patients and that in controls in our study. Female patients showed a much higher incidence compared to males with positive ANA ($p < 0.05$) as well as to females with negative ANA ($p < 0.05$). Though the prevalence rate of serum ANA in

healthy women is higher than in healthy men [11], female AD patients with severe facial lesions should be examined for serum ANA to differentiate from autoimmune diseases. Particularly in the AD patients with photosensitivity, serum autoantibodies have to be carefully investigated because ANA may be induced during PUVA therapy [4] and in patients with polymorphic light eruption [5].

ANA titers in our patients were relatively lower than those reported by Taniguchi et al. [7], as well as those in autoimmune diseases such as SLE. Their immunofluorescence patterns were homogeneous and/or speckled. These patterns are not disease specific nor significant particularly when present in low titers [3].

AD patients have dysfunction of cell-mediated immunity [9]. They tend to produce much more antibodies and to overreact with many environmental antigens. They may have activated polyclonal B cells producing autoantibodies, or their immunoresponse may cross-react with host antigens mimicking environmental antigens. Further investigations will be necessary.

References

- 1 Tan EM: Antinuclear antibodies: Diagnostic markers for autoimmune diseases and probes for cell biology. *Adv Immunol* 1989;44: 93–151.
- 2 Wilson MR: Antinuclear antibodies and cytoplasmic antibodies in lupus erythematosus; in Wallace DJ, Dubois EL (eds): *Dubois' Lupus erythematosus*. Philadelphia, Lea & Febiger, 1987, pp 227–243.
- 3 Sontheimer RD, Deng JS, Gilliam JN: Antinuclear and anticytoplasmic antibodies. *J Am Acad Dermatol* 1983;9:335–343.
- 4 Picascia DD, Rothe M, Goldberg NS, Roenigk HH: Antinuclear antibodies during psoralens plus ultraviolet A (PUVA) therapy – Are they worthwhile? *J Am Acad Dermatol* 1987;16: 574–577.
- 5 Murphy GM, Hawk JLM: The prevalence of antinuclear antibodies in patients with apparent polymorphic light eruption. *Br J Dermatol* 1991;125:448–451.
- 6 Twena DM, Marshall JS, Maeney MR, Bell EB: A survey of nonatopic and atopic children and adults for the presence of anti-IgE autoantibodies. *Clin Immunol Immunopathol* 1989; 53:40–51.
- 7 Taniguchi Y, Yamakami A, Sakamoto T, Nakamura Y, Okada H, Tanaka H, Mizutani H, Shimizu M: Positive antinuclear antibody in atopic dermatitis. *Acta Derm Venereol Suppl* (Stockh) 1992;176:62–64.
- 8 Hanifin JM, Rajka G: Diagnostic features of atopic dermatitis. *Acta Derm Venereol Suppl* (Stockh) 1980;92:44–47.
- 9 Quinti I, Brozek C, Wood N, Geha RS, Leung DYM: Circulating IgG autoantibodies to IgE in atopic syndromes. *J Allergy Clin Immunol* 1986;77:586–594.
- 10 White GL Jr, Wood SD, Rom WN: Prevalence of antinuclear antibodies in a normal male population. *Milit Med* 1983;148:536–538.
- 11 Frizler MJ, Pouls JD, Kinsella TD, Bowen TJ: Antinuclear, anticytoplasmic, anti-Sjögren's syndrome antigen A (SS-A/Ro) antibodies in female blood donors. *Clin Immunol Immunopathol* 1985;36:120–128.