

Descendant Family History of Atopic Dermatitis

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Descendant family history of atopic dermatitis was examined in 270 adult patients with this skin disease and their 529 children. Of the 529 children, 316 (60%) had a history of atopic dermatitis. Boys and girls were equally affected. The prevalence of affected children was 56% (180/321) in those patients whose spouses did not have a history of both atopic dermatitis and respiratory atopy, 81% (48/59) in those patients whose spouses had a history of atopic dermatitis, and 59% (88/149) in those patients whose spouses had a history of respiratory atopy only. These results indicate that the mode of inheritance of atopic dermatitis is autosomal dominant. They also suggest that the genetic background of atopic dermatitis is not identical with that of respiratory atopy. Key words: Autosomal dominant inheritance; Respiratory atopy; Children of atopic parents.

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It has long been known that hereditary factors play an important role in the development of atopic dermatitis, though environmental factors also determine the expression of this skin disease (1-3).

The specific mode of inheritance of atopic dermatitis, however, has not been defined. Autosomal dominant, autosomal recessive, and polygenic inheritance have all been suggested (4-8). Previous investigators have mostly tried to determine the inheritance mode by examining the ascendant family history of atopic diseases. But it is a fact of everyday experience that parents often forget episodes of their own infantile or childhood eczema. The conflicting opinions expressed in previous inheritance studies might be, at least in part, due to the inaccuracy of ascendant family histories of atopic dermatitis.

On the other hand, adult patients with atopic dermatitis know the familial nature of the skin disease and remember details of atopic dermatitis history in their children. Thus, compared to the ascendant family history of atopic dermatitis, the descendant family history is more reliable and well suited for investigation of the inheritance mode. In the present study we therefore observed a large number of adult patients with atopic dermatitis and examined the prevalence of this skin disease in their children.

MATERIALS AND METHODS

A total of 270 adult patients (105 men and 165 women) with atopic dermatitis who had at least one child were selected for this study (age range from 22 to 47 years, mean = 32 years). They were all seen in our outpatient clinic over the past 10 years (1982-1991). The diagnosis was based on the morphologic appearance and distribution of skin lesions, the clinical course, and personal and family history of atopic diseases. All patients fulfilled the criteria of Hanifin & Rajka (9).

The 270 patients had 529 children, 275 boys and 254 girls, who were

all 2 years old or more. Younger children were excluded, because it has been reported that atopic dermatitis usually has its onset during the first 2 years of life (10, 11).

We asked each patient, on the first visit to our clinic, about histories of atopic diseases (atopic dermatitis and respiratory atopy) of the spouse and children. On the second consultation, we made the same inquiry and confirmed the atopic family history. Of the 270 families, 198 (73%) had at least one child who had a history of atopic dermatitis, whereas in 72 families (27%), no such cases were found.

According to the atopic history of the spouse, the 270 patients in this study were classified into three different groups.

Group I consisted of those patients whose spouses did not have a personal history of both atopic dermatitis and respiratory atopy (164 cases).

Group II consisted of those patients whose spouses had a personal history of atopic dermatitis (26 cases). Of the 26 spouses, 25 had a history of infantile or childhood atopic dermatitis, and one was still suffering from this skin disease.

Group III consisted of those patients whose spouses did not have a personal history of atopic dermatitis but had a personal history of respiratory atopy (80 cases).

We then examined the prevalence of atopic dermatitis in children of these three family groups. Significant differences between groups were calculated by using the χ^2 test.

RESULTS

Of the 529 children in the 270 families of patients with atopic dermatitis, 316 (163 boys and 153 girls) had a history of atopic dermatitis. The prevalence of the skin disease was 59% (163/275) in the boys, and 60% (153/254) in the girls. Thus, there was no sex difference in the development of atopic dermatitis.

In the 164 families in group I, those patients whose spouses did not have a personal history of both atopic dermatitis and respiratory atopy, 321 children were observed. Of the 321 children, 180 (56%) had a history of atopic dermatitis.

In the 26 families in group II, those patients whose spouses had a personal history of atopic dermatitis, 59 children were seen. Of the 59 children, 48 (81%) had a history of atopic dermatitis. The prevalence of atopic dermatitis in the children in this group was significantly higher than that of the children in group I ($p < 0.01$).

From these findings, it may be safe to conclude that the mode of inheritance of atopic dermatitis is autosomal dominant (12). Based on the data that the incidence of affected children in bilateral atopic dermatitis parentages was 81%, it was estimated that approximately 86% of the adult patients in the present study were heterozygous, and about 14% were homozygous for the dominant gene of atopic dermatitis.

In the 80 families in group III, those patients whose spouses had a personal history of respiratory atopy only, 149 children were observed. Of the 149 children, 88 (59%) had a history of atopic dermatitis. The prevalence of atopic dermatitis children in this group was not different from that of group I ($p > 0.05$), suggesting that a history of respiratory atopy in parents has no

influence upon the development of atopic dermatitis in their children.

DISCUSSION

By examining the descendant family history of atopic dermatitis, the present study has demonstrated that the mode of inheritance of this skin disease is autosomal dominant.

It is well known that a marriage between two persons affected by the same dominant trait is statistically improbable. Therefore, patients suffering from an autosomal dominant disease are almost invariably heterozygous for the dominant gene of this disease (12). Thus, in the present study, marriages between patients with atopic dermatitis were rare. However, there were a considerable number of patients with atopic dermatitis whose spouses had a history of infantile or childhood atopic dermatitis. It is likely that quite a few patients with atopic dermatitis are homozygous for the dominant gene of this skin disease. The prevalence of the homozygotes in our patients was approximately 14%.

It has been widely assumed that atopic dermatitis and atopic respiratory diseases have the same genetic background (13, 14). However, it should be mentioned that no direct evidence has ever been presented for this assumption (15, 16). Several workers (17, 18) have reported that a number of patients with atopic dermatitis only had a family history of atopic dermatitis, but no family history of respiratory atopy. This suggests that some patients with atopic dermatitis lack a predisposition to respiratory atopy. In the present study, we showed that a personal history of respiratory atopy in the spouses of atopic dermatitis patients has no influence upon the development of this skin disease in their children. This finding strongly suggests that the genetic background of atopic dermatitis is not identical with that of respiratory atopy.

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