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Long Term Follow-up in Atopic Dermatitis

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A long-term follow-up study (minimum 24 years) has been carried out on 955 individuals with a history of atopic dermatitis (AD), who in childhood had been in- or out-patients at the Department of Dermatology, Karolinska Hospital, Stockholm. 62% of the in-patients and 40% of the out-patients still had dermatitis at investigation. The most common site was the hands. Eczematous hand involvement in childhood had been of predominant importance for the occurrence of hand eczema in adult life. Both tabular and stepwise logistic regression analyses revealed that the prognostically unfavourable factors as regards healing were, in order of importance, severe (widespread) dermatitis in childhood, family history of AD, associated allergic rhinitis, and/or bronchial asthma (with allergic rhinitis as the dominant of these two factors), female sex and early age at onset. Fewer than 20% of the individuals with all these prognostic factors were healed at the time of investigation, whereas 85% of those with none of the factors were healed. Persistent dry/itchy skin in adulthood was also found to be associated with persistent or recurring AD to a significantly ($p<0.001$) higher degree than normal skin. As this factor cannot be used as a predictor in childhood, it was not included in the regression analyses. *Key words: Atopic dermatitis; Prognosis.*

Numerous investigations of individuals with AD in childhood with emphasis on the prognosis have been performed during the last few decades (1–12). Only a few investigators have however concentrated on unfavourable factors influencing the healing of AD (3, 6, 7, 9, 10, 11). In order to further elucidate these factors, this follow-up study of a large well-defined patient material (13, 14) with AD in childhood has been carried out.

MATERIAL AND METHODS

Patients. 955 patients were divided into two groups. *Group 1* comprised 549 persons, 290 men and 259 women, who during the years 1952–56 had been hospitalized at the Department of Dermatology, Karolinska Hospital, Stockholm, Sweden, with the diagnosis of AD. The age of the patients at the time of the hospitalization was 0–14 years. The group comprised 90% (549/610) of the total number of the patients hospitalized during the five years under study. The 61 patients who were not included either could not be followed up because they had left the country or died, or were excluded because of doubtful diagnosis. Only 8 (1%) of the patients approached did not respond to repeated letters and telephone calls. *Group 2* comprised 406 (217 men and 189 women) out of a total of 460 individuals who had visited the out-patient clinic during 1955–56 but had not been hospitalized. The criteria for inclusion in the study were otherwise the same as for group 1. Only 11 (3%) of the patients who were approached did not respond to repeated letters and telephone calls. The individuals in the two groups were 24–44 years of age. The follow-up time was minimum 24 years.

Methods. The basic material for the study consisted of the answers to a detailed questionnaire together with previous medical records. 189 individuals from Group 1 and 162 from Group 2, selected at random, were clinically examined by the author. The other individuals in the two groups were interviewed by telephone and their answers were recorded. None of the patients answered the questionnaire by mail. A detailed report of the selection of the two groups and the methods of investigation including statistical analyses has previously been published (14).

RESULTS

There was no significant difference between the results for the entire material and the corresponding results for the clinically examined individuals from the two groups. This was interpreted as evidence of reliability of the results.

At the investigation 62% and 40% in Groups 1 and 2 respectively, had eczematous changes on hands and/or other parts of the body ($p<0.001$). According to a severity index based on extension and activity of the eczema (14) 45% of the clinically examined individuals in Group 1 had mild, 46% moderate and 9% severe dermatitis. The corresponding figures for Group 2 were 60%, 36% and 4%.

The hands were the most common site of the dermatitis. 41% and 25% respectively in the two groups had hand eczema. In a control group of 199 individuals who had never shown any signs or symptoms of atopic disease, nor had any family history of atopy, only 4% had dermatitis of the hands at investigation.

In tabular analyses the following factors were found to be associated with poor healing of AD: *Dry/itchy skin* in adulthood was found to be associated with persistent or recurring AD to a significantly ($p<0.001$) higher degree than normal skin. *Severe dermatitis in childhood*, assessed as number of sites of the disorder, showed significantly that the more widespread the dermatitis in childhood the lower the frequency of healing. A complete evaluation of the degree of severity should have comprised also the activity of the dermatitis which, however, was difficult to measure over a long period of time. Therefore, the number of sites was chosen as the sole measure. In the two groups 32% had or had had *bronchial asthma* and 60% *allergic rhinitis* during some periods of their lives. These individuals showed a significantly lower frequency of healing than individuals without a history of respiratory disease ($p<0.001$ for both calculations). A *family history of AD* (parents/siblings) was reported by 51% and 43% in the two groups. In comparison with individuals without atopy in the family these individuals showed a significantly lower frequency of healing ($p<0.001$). *Female sex* was an unfavourable factor as regards healing of AD. In Group 1 30% of the women and 44% of the men were healed at the time of investigation. The corresponding figures for Group 2 were 56% and 65%. The difference between the sexes was significant only in Group 1 ($p<0.001$). In 73% of the individuals in Group 1 and 58% in Group 2 the AD had started before one year of age and in 98% and 90% before five years of age. *Early age at onset* (<1 year) gave a significantly lower healing rate ($p<0.01$) in Group 1 in comparison with individuals with comparatively late age at onset (>3 years). No such correlation was found in Group 2.

An attempt to define the unfavourable prognostic factors with respect to healing was also made by stepwise logistic regression analysis. For this purpose the two groups were pooled. Even though dry/itchy skin in adulthood turned out to be the predominant unfavourable factor as regards healing, this factor cannot for obvious reasons serve as a predictor in childhood. It was therefore not included in the regression analysis. As regards the other factors, in order of relative importance, severe dermatitis in childhood, family history of AD, associated allergic rhinitis, associated bronchial asthma, female sex and early age at onset were found to unfavourably affect the frequency of healing. The association between severe dermatitis in childhood and low healing, i.e. persistent dermatitis at the time of investigation, was very strong, while female sex and early age at onset were of limited importance compared to the other factors. Fewer than 20% of the individuals, burdened in childhood by all the prognostic factors mentioned were healed at the investigation. On the other hand about 85% of the individuals without any of the predicitive factors, especially severe dermatitis in childhood, family history of AD and associated allergic rhinitis/bronchial asthma, were healed.

As to the occurrence of HE in adult life the statistical analyses revealed the prognostic factors of importance to be partly the same as for persistent AD in general. Noteworthy was, however, that eczematous involvement of the hands in childhood was of predominant importance.

DISCUSSION

As to the prognosis of AD and unfavourable prognostic factors in AD previous investigations have differed considerably. The figures for persistent dermatitis have varied as much as between 10% (10) and 83% (6). With the exception of a recent study by Vickers most of the investigations have been performed, however, on small numbers of patients with short follow-up time or with low response rates. The severity of the AD in childhood has also varied in different studies. Some of them have comprised only in-patients with presumably severe AD, while e.g. Vickers' patient material have consisted solely of out-patients. The results of the present study strongly suggest that severe AD in childhood is connected with poor healing.

The discrepancies in results as regards healing of AD may also have several other explanations. The diagnostic criteria for the patients included in the different investigations have not been uniform. In this follow-up study only those with a clear diagnosis of AD (13, 14) were included, while patients with e.g. seborrhoeic type of infantile eczema were excluded. On the other hand all patients with a type of eczema in adulthood which could be connected with AD in childhood, including irritant hand eczema on an atopic basis, were recorded as not healed. It seems possible that the high risk of recurrence among patients with AD in childhood has been underestimated in some other studies, particularly in those with short follow-up periods. In the present study nearly 25% of the patients had been healed for long periods in childhood, but had as adults a recurrence of their AD, often localized to the hands.

What has been said above about differences in patient materials, investigation methods, diagnostic criteria etc. in the studies on the prognosis applied essentially to the prognostic factors as well. This also means that a comparison of results is difficult to carry out. In spite of this an attempt to compare some of the findings as regards prognostic factors in AD has been made in articles published in extenso (14, 15, 16).

The results of the present study suggest that the statistically weighted predictors can be of great value in clinical work, especially in the context of occupational dermatology. Further analyses will therefore be accomplished.

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