

Hand Eczema in Patients with History of Atopic Manifestations in Childhood

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A follow-up study of two groups of individuals aged 24-44 years, with a history of severe and moderate atopic dermatitis in childhood ($n=549$ and 406 respectively), showed that the most common site of atopic dermatitis was the hands. The prevalence of hand eczema in the two groups was 41% and 25% respectively. The corresponding figure for a group of 222 individuals with respiratory allergy, but not atopic dermatitis in childhood, was 5%, and for a control group ($n=199$), without family or personal atopy, 4%. In all four groups the majority of the patients had mild to moderate hand eczema. The fingers were the most common site in all groups. In 69%, 55%, 36% and 12% respectively, hand eczema was found simultaneously with other eczematous manifestations. Irritants were considered by 71-96% in the four groups to aggravate the hand eczema. Contact with various food substances, particularly proteins, was regarded by 38%, 43%, 30% and 9% as an eliciting/aggravating factor. Dust was looked upon as an eliciting/aggravating factor by 25% and 20% of the individuals in the two groups with atopic dermatitis in childhood, but by no one in the control group. *Key words: Atopic dermatitis; Hand eczema; Bronchial asthma; Allergic rhinitis.* (Received May 29, 1984.)

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Hand eczema (HE) is a common disorder, which often has an atopic background. In a major epidemiological survey in southern Sweden in 1969, the prevalence of HE in the population was estimated at approximately 2% (1). In this survey, atopic dermatitis (AD) occurred or had occurred in 19% of 827 patients with HE. In another study of patients with HE (2), 14% were considered to have atopic HE. Among patients with active AD, the prevalence of HE is high. The most common site of AD in adults seems to be the hands (3, 4). Of 233 patients with AD investigated and patch-tested by the ICDRG (International Contact Dermatitis Research Group), 68% had HE (5, 6). In a similar study 69% of 130 patients with active AD had hand involvement (7). In a selected group of persons in hospital wet work, individuals with atopic background had a higher prevalence of HE than non-atopics (8).

Although AD has been investigated with regard to a multitude of aspects, no long-term follow-up of patients with atopic disease in childhood has been carried out with emphasis on atopic HE in adult life.

The aim of the present study was to investigate to what extent individuals with AD in childhood, or respiratory allergy but not AD in childhood, had suffered from HE in adult life, in comparison with controls without family or personal history of atopy. The aim was also to study age and sex factors in individuals with HE, as well as distribution and morphology of HE.

PATIENT MATERIAL

The patients were divided into four groups. *Group 1* comprised 549 persons, 290 men and 259 women, who during 1952-56 had been hospitalized at the Department of Dermatology, Karolinska Hospital, Stockholm, Sweden, with the diagnostic number for AD. Individuals not satisfying the criteria of AD

set up by Hanifin and Rajka (9) were excluded from the follow-up after a scrutiny of the patients' records or after appropriate interviews. The age of the patients at the time of hospitalization was 0–14 years. The group comprised 90% (549/610) of the total number of the patients with AD hospitalized during the five years under study. The 61 patients who were not followed up were excluded because they had left the country or died, or because of doubtful diagnosis. Only 8 (1%) of the patients who were approached did not respond to repeated letters and telephone calls.

Group 2 comprised 406 out of a total of 460 individuals, 217 men and 189 women, who had visited the out-patient clinic at the same hospital 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.

Group 3 comprised 222 individuals, 145 men and 77 women, who had not had AD in childhood, but who on some occasion during 1949–61, at an age of 0–14 years, had been in- or out-patients at the Department of Pediatrics, Karolinska Hospital, Stockholm, Sweden, for respiratory allergy (bronchial asthma (\pm) allergic rhinitis). The individuals were selected from a group of 452 persons who in 1978 had been summoned for observation at the Pediatric Department. From this group, 205 persons with AD in childhood were excluded. Of the remainder, 22 were inaccessible owing to incomplete personal data, wrong address or because they had emigrated. Only 3 (1%) of those who were approached for investigation did not respond to repeated letters and telephone calls.

Group 4 comprised 199 individuals, 114 men and 85 women, who had never shown any signs or symptoms of atopic disease nor had any family history of atopy (parents, grandparents, siblings, or siblings of parents). Initially a group of 461 persons was selected by computer after matching against Groups 1 and 2 as regards age, sex and domicile. All individuals with personal or family history of atopy were omitted from the original group. Another 11 were not accessible owing to wrong address or because they had emigrated. Only 5 (1%) of the individuals originally approached did not respond to repeated letters and telephone calls.

The individuals in the four groups were 24–47 years of age. The follow-up time in Groups 1–3 was 24 years minimum. A detailed account of the selection of the four groups has been published in a previous report (10).

METHODS

The basic material for the study consisted of the answers to a detailed questionnaire, which had been formulated for the interviews, together with previous medical records. 183 individuals from Group 1 and 162 from Group 2, selected at random, were clinically examined by the author (10). All other individuals in the four groups were questioned by telephone and their answers were recorded. None of the patients answered the questionnaire by mail.

All information was computerized and analysed. Differences in frequencies between different parts of the material were tested with the chi-square test. The null hypothesis that no difference or no correlation existed was rejected at the significance levels 5% ($p < 0.05$), 1% ($p < 0.01$) and 0.1% ($p < 0.001$). In cases, where the number of patients was too small to give a valid result, Fisher's exact test was used.

RESULTS

Prevalence of HE

The hands were the commonest site of eczematous lesions observed in the cases of ongoing AD. Of all patients in Groups 1 and 2 with persistent or recurring dermatitis, 67% and 65% respectively showed hand involvement.

As there were no significant differences in prevalence and distribution of HE between the clinically examined groups and the total Groups 1 and 2, most of the tabular analyses were performed on the total patient material. The prevalence of HE was 41% in Group 1, 25% in Group 2, 5% in Group 3 and 4% in Group 4. (The corresponding figures for the 183 and 162 clinically examined persons in Groups 1 and 2 were 41% and 29%.) Including individuals who were temporarily free of symptoms, but had had HE on some occasion during the preceding 12 months, the frequencies of HE for the four groups were 51%, 35%, 9% and 7% (Fig. 1) ($p < 0.001$ for all calculations except for the difference between Groups 3 and 4).

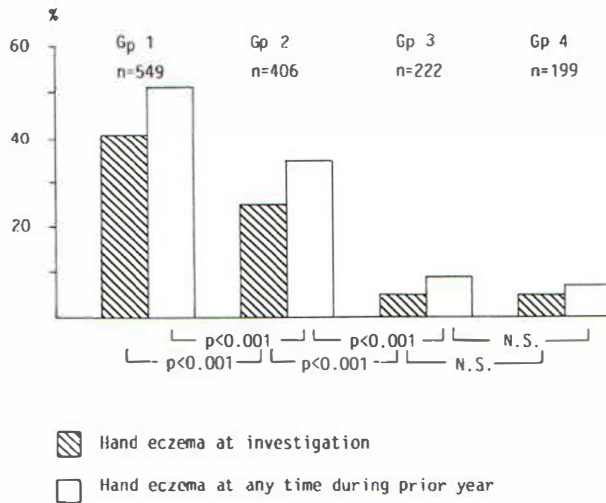


Fig. 1. Frequency of hand eczema at the time of investigation or on some occasion during the preceding 12 months.

Age and sex distribution

The age distribution for patients with HE in each group was found to be largely the same as for the entire group. There was no evidence of declining prevalence with increasing age.

Women in all groups had a somewhat higher prevalence of HE than men. The difference, however, was significant only in Group 3 ($p < 0.01$) (Table I). There was also a tendency towards more severe HE in women than in men, but the difference was not statistically significant in any group.

Sites of HE

The sites of HE in the combined Groups 1 and 2 are shown in Fig. 2. In more than 85% of the individuals with HE, the fingers were involved, and in about 25% the palms. Eczema only on the palms occurred in only 2%. In Groups 3 and 4, 7/11 and 5/8 respectively had finger involvement, 3/11 and 2/8 had eczema on the palms, in four out of the five cases as the only site.

In 69% of the patients in Group 1, 55% in Group 2, 36% in Group 3 and 12% in Group 4, HE was combined with eczematous manifestations on the rest of the body. The combinations hands/feet, hands/antecubital fossae and/or popliteal fossae, and hands/face were most common in Groups 1 and 2, while the combination hands/feet was the most common in Group 3 and also occurred in the only combined case in Group 4.

Table I. Hand eczema at investigation in relation to sex

	Gp. 1 N=549	Gp. 2 N=406	Gp. 3 N=222	Gp. 4 N=199
Male	38	23	2	4
Female	46	28	10	5
Total	41	25	5	4
p-value	NS	NS	<0.01	NS

Figures indicate percentage values. The p-value indicates level of significance for difference between sexes. NS=not significant.

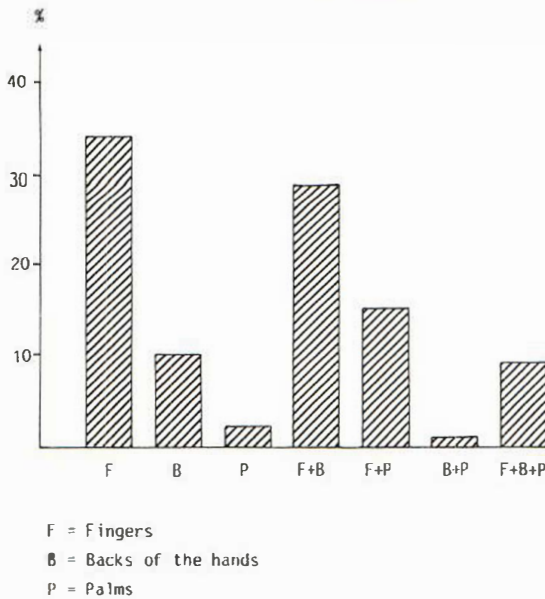


Fig. 2. Localization of hand eczema. Bars indicate percentage values obtained from pooled Group 1 and 2 patients. $N=329$.

Morphology of HE

At the clinical examination of the patients in Groups 1 and 2, several types of eczematous lesions were seen; some circumscribed, some of plaque type, but more often in diffuse or mixed forms. Various features were observed, including erythema, oedema, vesiculation, crusting, excoriation and scaling. No clear distinction could be made in these groups between eczemas that were considered to be elicited by exogenous factors and those that were considered to be elicited by endogenous factors.

Severity of HE

The degree of severity of HE in the clinically examined patients in Groups 1 and 2 is shown in Table II, in which the following severity index was used: Mild HE=2 points, moderate HE=3-4 points, severe HE=5-6 points. The points were allotted as follows: 1 point for every site (fingers, backs of the hands, palms) and 1 point for low activity of the HE (redness and scaling), 2 points for somewhat higher activity (a few papules and/or vesicles) and 3 points for high activity (vesiculation, fissuring and/or pyogenic infection). The results agreed well with those obtained from the questionnaire, which included all the patients in Groups 1 and 2. In Groups 3 and 4 no severe HE was reported.

Approximately 30% of the HE patients in Groups 1 and 2 and approximately 10% in Groups 3 and 4 had been sick-listed due to HE. Of those, the majority in Groups 1 and 2,

Table II. Severity of hand eczema (HE) in clinically examined adults with atopic dermatitis in childhood

Patient	<i>n</i>	Mild HE	Moderate HE	Severe HE
Group 1	76	34 (45)	32 (42)	10 (13)
Group 2	47	35 (74)	11 (24)	1 (2)

Figures in parentheses indicate percentage values.

and all in Groups 3 and 4, had been sick-listed for less than 3 months. Approximately the same picture was obtained when treatment of the HE with corticosteroids was taken into account. About 30% of the HE patients in Groups 1 and 2 were using corticosteroid creams or ointments on the day of the investigation.

Aggravating factors

The outcome of the investigation as regards the effects on HE of various aggravating factors, i.e. water, chemicals, cold (winter deterioration), food, dust and psychological stress, is shown in Table III.

DISCUSSION

A high prevalence of HE in adult AD patients has been noted by several authors (5, 7). The present study confirmed that the hands are the most common site of AD in adults (2, 3, 4). Previous studies of HE in atopic patients have dealt solely with individuals with ongoing AD. The present study comprised adult individuals with AD in childhood, who at the time of investigation had varying degrees of symptoms or were free of symptoms. This study also had the advantage of comparing, with respect to hand eczema, patients with different atopic manifestations in childhood and a control group.

In the groups with a history of AD in childhood, the prevalence of HE was very high (41% and 25% respectively) compared to the figure for the control group without any personal or family atopy (4%). The figures for the total Groups 1 and 2 were in close agreement with those for the clinically examined individuals in Groups 1 and 2 (10), which supports the results for the total groups. The significant difference in prevalence of HE between Group 1, with severe AD in childhood, and Group 2, with moderate AD in childhood, indicates that individuals with milder forms of AD in childhood develop HE as adults to a lesser extent than individuals who have had more severe forms of AD.

Contrary to the findings in this study, a significant over-representation of HE in patients with a history of respiratory allergy without atopic dermatitis, as compared with HE in non-atopic persons, has been observed by Lammintausta in a study of a comparatively limited number of persons engaged in wet work at a hospital in Finland (8).

In accordance with the present study, HE has been found in several reports to be more frequent in women than in men (1, 11, 12). This is probably mainly due to the fact that women in their domestic work expose their hands more than men do to various forms of irritants (13). The interrelationship between endogenous eczema and eczema caused by

Table III. Factors aggravating hand eczema in atopics and non-atopics

	Gp. 1 N=333 (%)	Gp. 2 N=197 (%)	Gp. 3 N=30 (%)	Gp. 4 N=22 (%)
Water	68	73	70	84
Various chemicals	71	80	77	96
Friction	30	29	27	12
Cold (winter deterioration)	74***	72***	52	32
Contact with various foods	38**	43***	30*	9
Dust	24**	26**	13	0
Psychological stress	51***	32**	13	9

Significance in comparison with the figures for Group 4: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

irritants is, however, very difficult to evaluate (14, 15, 16). It has been found in a previous report (13) that not only women with heavy contact with irritants, but also women with a minimum of such contacts have a tendency to develop HE to a greater extent than men. This suggests that a constitutional factor in women may partly be responsible.

The overall hand eczema picture in Groups 1 and 2 agreed very closely with the picture found in the clinically examined individuals in these groups. The degree of involvement of fingers, backs of the hands and palms was also similar to that found in earlier studies (1, 4), with the exception that in one report (4) eczema of the palms was found to be more frequent than in the present study.

As in other reports (2, 7), approximately two-thirds of the patients who had atopic HE (Groups 1 and 2) also had eczema on other parts of the body, especially on the feet, in the flexures and on the face. This supports the suggestion that HE can be regarded in most cases as a manifestation of AD. The frequency of simultaneous hand and body eczema was low in Group 3 and negligible in Group 4. In both these groups, however, the numbers of patients with HE were too low to allow any statistical assessment.

Several authors have tried to distinguish atopic HE from other types of HE on morphological grounds, but have found that HE in atopics can be of many different types; lichenified plaques, dyshidrotic lesions, hyperkeratosis with fissuring of the finger pulps and other more diffuse forms, all of which can also be seen in other types of HE (2, 7, 17, 18, 19). The conclusion, confirmed by the present study, has been that the morphology can give certain indications but no decisive evidence of the diagnosis.

It is generally considered that the atopic skin has a reduced resistance to exogenous action by chemicals, friction etc, and that therefore individuals with a history of AD run the risk of developing a non-specific hand eczema (11, 16, 20, 21, 22). This HE is commonly diagnosed as irritant hand dermatitis on an atopic base, while HE in individuals without evident exposure to irritants is usually referred to as atopic HE. In the present study, this distinction could not be justified on morphological grounds. Furthermore, in another study the author found that endogenous factors were predominant as regards development of HE in patients with AD in childhood (13, 23), indicating that even individuals exposed to irritant factors frequently had a mixed endogenous and exogenous or a solely endogenous eczema. The HE was most often only one manifestation among others of the AD itself, often aggravated by irritants. Therefore no distinction between atopic HE and irritant HE on an atopic base was made in the present study.

The low degree of severity of the HE in the four groups was confirmed by the low sick-listing rate and the limited use of corticoid creams and ointments.

The general opinion seems to be that the effect of house dust on the skin is mainly irritative. It has, however, been claimed that contact with and/or inhalation of dust may elicit/aggravate AD (24, 25, 26). In the present study, a high proportion of HE patients in Groups 1 and 2 considered their HE to be aggravated by dust. In Group 4 (non-atopics), in whom no type of immunological reactions could be expected, this allergen was stated to have no effect. This may support an immunological theory, but it is also probable that the irritative effect of dust is more pronounced in AD individuals, who are more susceptible to irritants, than in non-atopics.

Protein contact dermatitis and/or contact urticaria due to hypersensitivity to a number of various proteinaceous food substances have been reported in a number of papers (27-32). A comparatively high number of HE patients among the atopics (30-43 %) considered food contact to have an eliciting/aggravating effect on their eczema, while the figure for non-atopics was only 9%. This suggests that in atopics HE may often be elicited/aggravated by immunological type I reactions. It is, however, unclear to what extent other mechanisms are involved.

Several lines of evidence suggest that psychological factors affect the course of AD (18). This was confirmed in the present study, which showed a significant difference between the two AD groups and the control group as to the percentage of patients reporting that psychological stress had elicited or aggravated their HE.

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