

## An Epidemiological Study of Hand Eczema

### III. Characterization of Hairdressers with and without Hand Eczema, Regarding Demographic Factors and Medical Histories

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The aim of this study was to compare, by stratification, sub-groups of hairdressers.

Three groups were considered: Group I (102 persons) consisted of hairdressers reporting skin affection at the time of completing an earlier mailed questionnaire (point prevalence). Group II reported exanthema prior to completing, while group III reported not having had exanthema at all (51 and 50 persons, respectively).

No significant difference was found between these groups with regard to age and duration in work.

The mean number of months since start of disease was significantly higher for group I (64 (range: 0.5–552)) than group II (7 (range: 0.6–38)).

The frequency of atopic dermatitis was 12.7% (C.I: 6.3–19.2) in group I, compared with 3.9% (C.I: 0.0–9.2) in group II and none in group III. This difference between groups was significant.

A significantly higher extent of sick leave was found in group I, compared to group II. Key words: contact dermatitis; occupation; epidemiology; atopic dermatitis; sick leave.

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Hand exanthema caused by hairdressing is an important clinical entity among occupational diseases. The term "exanthema" used in this report implies all rashes affecting the hands. Naturally, eczema constitutes the majority of these.

Various factors, single or in combination, favour the development of hand eczema. Atopy represents an important personal factor (1). External factors include wet work, exposure to irritants and sensitizing agents (2). Hand eczema, once present, causes considerable problems due to its relapsing nature and to its tendency to become chronic.

A recent questionnaire study of 682 hairdressers in a county of Norway (3), showed that 42% suffered or had suffered from exanthema of the hands and/or forearms. Sixteen per cent of the hairdressers were suffering from exanthema when they answered the questions, and 26% prior to completing it. The remaining group (58%) were never affected.

This report details the information gained by personal interviews of these hairdressers with and without hand exanthema. The prime aim of the study was to make a characterization by both demographic factors and estimates of atopic diathesis, based on medical histories.

#### MATERIAL AND METHODS

From the recent questionnaire study of 682 hairdressers in the county of Oslo we define the following populations:

#### Study population I

A total of 110 hairdressers reported exanthema of the hands and/or forearms at the time of completing the previously mailed questionnaire (96 females and 14 males from 62 salons).

#### Study population II

Exanthema prior to completing the questionnaire, was reported by 176 hairdressers. By simple randomization, a sub-sample of 66 hairdressers was formed (60 females and 8 males from 43 salons).

#### Study population III

A total of 395 hairdressers reported never having had exanthema. By simple randomization, a sub-sample of 64 hairdressers was achieved (56 females and 8 males from 43 salons).

There was a time delay varying from a few weeks up to 5 months between completion of previously mailed questionnaires and the personal interviews. Therefore, it was not always possible to interview all respondents. The interviews were carried out during working hours at the place of employment, and were followed by a physical examination of hands, not reported here. The following groups of 203 hairdressers included are based on information gained by the earlier questionnaire survey, and not on the morphology of hands by physical examination.

Group I: 102 (93%) of the hairdressers with current dermatitis were included in the study.

Group II: 51 (29%) of the hairdressers with earlier exanthema.

Group III: 50 (13%) of the hairdressers with no exanthema at all.

A standard questionnaire was used by the doctor during the personal interview. The interviews were completed between April 15 and June 15, 1988. Information collected concerned earlier or present atopic dermatitis, possible allergic asthma/ rhinoconjunctivitis and allergic symptoms among siblings or parents. Additional information was collected, concerning contemporary psoriasis, clearing of exanthema at weekends or on holidays and seasonal variation in disease activity, together with, the number of months since the disease started, start of disease related to training period and extent of sick-leave.

#### Diagnostic criteria

Both the diagnosis of previous or present atopic dermatitis, and previous or present atopic mucosal symptoms, such as asthma or allergic rhinitis/conjunctivitis, were made by the respondents' own physician. The original diagnoses were not changed by the interviewer. The diagnoses were confirmed by the interviewer, if the symptomatology (apart from hands) or medical history was obvious. Regarding familial atopy, past or present atopic symptoms of parents and siblings were accepted, as reported by the respondents themselves. Also, psoriasis was accepted as a diagnosis only in cases confirmed by the patients own physician, or by the interviewer when symptoms were present.

#### Statistical methods

Continuously distributed variables were expressed as mean values with 95% confidence intervals (C.I.). The Student procedure (4) was used for calculation of the intervals. Frequencies were expressed as a percentage with 95% confidence intervals constructed by using the theory of single Bernoulli sequences (4). Comparison of the groups regarding continuously distributed variables were carried out by using analysis of variance (4). Fisher's Exact test was used to analyse the categorical data in two-way tables (5).

All tests used in this analysis were two-tailed. Differences were

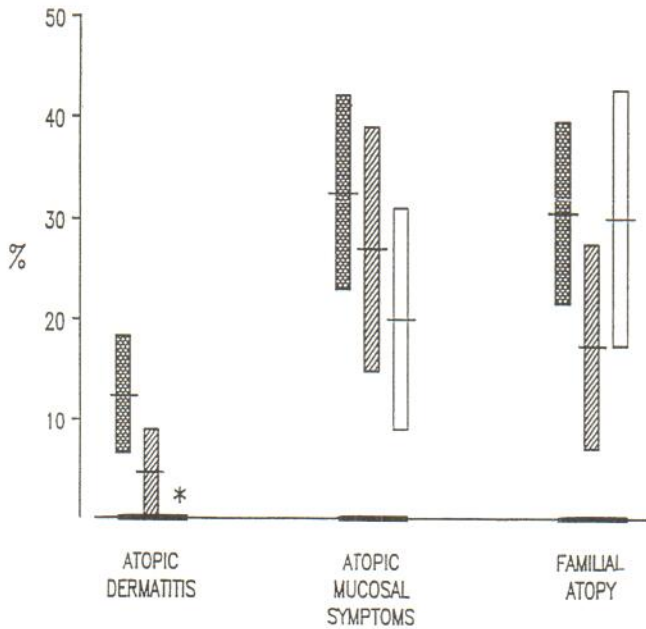


Fig. 1. Frequency of atopic dermatitis, atopic mucosal symptoms and familial atopy in hairdressers with present hand exanthema, with earlier hand exanthema and without experience of hand exanthema.

■ present exanthema  
 ▨ earlier exanthema  
 □ no exanthema  
 \* no atopic dermatitis patients

considered statistically significant when p-values were less than or equal to 5%.

## RESULTS

The frequency of atopic dermatitis was 12.7% (C.I: 6.3–19.2) in group I and 3.9% (C.I: 0.0–9.2) in group II, while none of the hairdressers without skin affection reported atopic dermatitis in their medical history (Fig. 1). The difference in frequency between group I and II was significant ( $p=0.01$ ).

Table I. Comparison of three groups regarding age (yrs.), total duration in work (months), hours per week in work and no. of months since start of exanthema. The results are expressed as mean values with 95% confidence intervals

	Without experience of hand exanthema (n = 50)	With earlier hand exanthema, but not now (n = 51)	With hand exanthema (n = 102)
Age	28 (25–31)	26 (24–28)	26 (24–28)
Total duration in work	119 (83–155)	95 (69–121)	85 (65–105)
Hours per week in work	37 (36–38)	37 (35–39)	36 (34–37)
No. months since start of exanthema		7 (5–9)	64 (47–82)

Table II. Comparison of the groups regarding contemporary psoriasis, clearing of exanthema in weekends and seasonal variation in disease activity

	Contemporary psoriasis		Clearing of exanthema in weekends/holidays		Seasonal variation in disease activity	
	Yes	No	Yes	No	Yes	No
With present hand exanthema (n = 102)	6	96	81	20	62	40
With earlier hand exanthema, but not present (n = 51)	1	50	36	11	32	18

The frequency of atopic mucosal symptoms was 32.4% (C.I: 23.3–41.4) in group I, 27.5% (C.I: 15.2–39.7) in group II and 20% (C.I: 8.9–31.1) in group III (Fig. 1). For familial atopy the figures were 29.4% (C.I: 20.6–38.3), 17.6% (C.I: 7.2–28.1) and 32% (C.I: 19.1–44.9), respectively. The three groups were not significantly different with regard to these parameters ( $p=0.28$  and  $p=0.20$ , respectively).

The groups were found to be equal with regard to age, duration of work and hours per week in work (Table I).

The mean number of months since start of disease was 64 (range: 0.5–552) in group I and 7 (range: 0.6–38) in group II. This difference was significant ( $p<0.01$ ). No significant difference was found between group I and II regarding clearing of skin disease on weekends and holidays, and seasonal variation in disease activity. Furthermore, there was no significant difference between all three groups regarding contemporary psoriasis (Table II).

Winter was the season of the year when cutaneous disease manifestation was most marked in group I and II (Table III).

Fifty-three per cent of the hairdressers in group I reported start of exanthema during the training period. Twenty per cent had had disease before, and 27% after the training period.

Of the hairdressers with present skin affection, 18% had experienced sick-leave because of the disease, compared to 6% among the hairdressers with earlier exanthema. The difference was significant ( $p=0.05$ ).

Table III. Comparison of groups reporting seasons of year with greatest disease activity

	Winter	Spring	Summer	Autumn	Undecided
With present hand exanthema (n = 102)	53	6	6	8	29
With earlier hand exanthema, but not present (n = 51)	26	2	0	4	19

## DISCUSSION

According to an earlier report by the authors (3), the mean age for the total group of hairdressers, including affected and non-affected cases, was 28 years. The figures for this part of the study show no difference in mean age between the subgroups of hairdressers (Table 1). This is quite unexpected because we assume that dermatitis of hands particularly affects young hairdressers. The low mean age for affected and non-affected hairdressers compared with, in an earlier study (6), a control group of teachers, may indicate that they frequently change or leave their job. Then the lack of difference in mean age between the subgroups of hairdressers, may support the view that factors other than hand eczema, probably non-medical, contribute to the low mean age.

The marked difference between hairdressers with exanthema and those who had had exanthema regarding disease duration was a significant finding of this part of study (Table I). But, surprisingly, this difference in disease chronicity, does not affect the age distribution.

It is important to state that in our study the classification of patients in the group of atopic dermatitis is not only based on the criteria of Hanifin & Rajka (7), since the interview concerns medical history, and then often retrospective evaluation. The final diagnosis of atopic dermatitis must be made on a combination of objective findings and history (8).

In an earlier report (6), there was made an indicative, but not significant, finding of lower frequency of atopic dermatitis among prevalent cases of hairdressers compared with a control group of prevalent teachers. In this part of the study, the difference between subgroups of hairdressers was significant (Fig. I). Such prevalence estimation will have to be "length-biased", i.e. in a group of sick persons chronic cases will be overrepresented

with regard to the part of incidence. In this case, we know that hand eczema on an atopic basis has a bad prognosis. On the other hand, more than half of the persons in group I reported onset of disease during the apprentice period. We probably are seeing a pre-employment selection of "non-atopics" during the hiring process ("healthy worker effect"). The Norwegian training period for hairdressers involves a heavy load of wet work and irritantia during apprenticeship; junior hairdressers especially do more shampooing than skilled hairdressers. Extent of sick-leave should indicate the severity of skin disease. In our study the significant finding of higher sick-leave among prevalent cases in group I, compared to group II, follow the finding of higher chronicity in group I, as mentioned earlier. Hence, chronicity and severity seem to correlate with each other.

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