

## CLINICAL REPORT

# Prevalence of Hand Eczema in an Adult Swedish Population and the Relationship to Risk Occupation and Smoking

Peter MONTNÉMERY<sup>1</sup>, Ulf NIHLÉN<sup>2</sup>, Claes Göran LÖFDAHL<sup>2</sup>, Per NYBERG<sup>3</sup> and Åke SVENSSON<sup>4</sup>

Departments of <sup>1</sup>Community Medicine/Division of Geriatric Medicine and <sup>3</sup>Caring Sciences, Lund University, <sup>2</sup>Respiratory Medicine, Lund University Hospital and <sup>4</sup>Department of Dermatology, Malmö University Hospital, Sweden

Using a postal questionnaire the prevalence of hand eczema was determined in a general population of 11 798 individuals aged 20–77 years who were randomly drawn from the population records. The response rate was 78.1%. One-year prevalence of hand eczema among women varied between 1.9% and 10.8%, with the highest figure among those aged 30–39 years. The corresponding figures for men were 2.3% and 5.6%, with the highest figure among those aged 20–29 years. Lifetime prevalence varied between 5.7% and 16.7% among women and between 5.2% and 9.5% among men. Using multiple logistic regression analysis female sex (OR=1.91, 95% CI 1.47–2.47) and smoking (OR=1.35, 95% CI 1.04–1.75) were independent risk factors for reporting 1-year prevalence of hand eczema, whereas age (OR=0.99, 95% CI 0.97–0.99) was inversely related to the 1-year prevalence of hand eczema. Aggregated risk occupation or categorized occupation such as medical and nursing work, production or service were not significantly associated with 1-year prevalence of hand eczema. **Key words:** epidemiology; hand eczema; high-risk occupation; risk factor; questionnaire study; smoking.

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Peter Montnémer, MD, PhD, Department of Community Medicine/Division of Geriatric Medicine, Lund University, Malmö University Hospital, SE-205 02 Malmö, Sweden. E-mail: peter.montnemery@smi.mas.lu.se

Hand eczema is a common skin disease that affects about 10% of the general population of working age in Sweden and is also among the most frequent occupational diseases (1, 2). The economic and social impact is considerable for both the individual and society. The most recent comprehensive prevalence study of hand eczema in an adult population in southern Sweden was performed by Agrup between 1962 and 1965 (3). Meding & Järholm have reported a decreased frequency of hand eczema between 1983 and 1996 (2).

The aim of the present study was to examine the prevalence of self-reported hand eczema in an adult population and its relationship to age, gender, smoking habits and occupations using a cross-sectional questionnaire study.

## MATERIALS AND METHODS

### Study area and climate

The study was performed in southern Sweden in 2000. The area consisted of the city of Malmö, the third largest city in Sweden and the surrounding 10 municipalities. Six of these municipalities are densely populated, whereas four of them mainly have a rural population. The population of the whole study area was 540 497. The southern part of Sweden has the highest population density in Sweden (84 inhabitants per km<sup>2</sup>). The climate is temperate with an average yearly temperature of +8.4°C with wet and foggy winters. The average temperature of the coldest month (February) is –0.5°C and that of the warmest month (July) is +16°C.

### Study population

The study population consisted of 11 798 individuals, living in southern Sweden, aged 20–77 years, who were randomly drawn from the population records. That sample comprised 4% of the total population in the corresponding age intervals. There were six age cohorts, 20–29, 30–39, 40–49, 50–59, 60–69 and 70–77 years, with comparable numbers of men and women in all groups.

### Questionnaire

The questionnaire used is largely based on the questionnaire used in our previous studies (4–7) concerning respiratory symptoms. It was developed from a revised version of the British Medical Research Council (BMRC) questionnaire (8). All the questions from the previous questionnaire used in the 1992 survey (4) remained unaltered, but a few new items were added (7). Two questions concerning hand eczema were used. 1: ‘Have you during the past 12 months had hand eczema on some occasion?’ (i.e. reflecting 1-year prevalence); 2: ‘Do you have or have you had hand eczema?’ (i.e. reflecting lifetime prevalence). Smokers were defined as those who stated that they smoked more than five cigarettes a day. The answers in the questionnaire were given as ‘yes’ or ‘no/do not know’.

In 2000, as in 1992, the questionnaire was sent to the study population during the spring. If no response was received within 2 weeks a first reminder was sent out and, after 10 weeks, a second, final reminder including a new questionnaire was mailed.

Occupation was coded according to a socio-economic classification system elaborated by Statistics Sweden (9). ‘Risk occupations’ were classified in three groups according to Meding & Järholm (2). They were occupations in ‘medical and nursing work’, ‘production’ and ‘service’.

### Statistics

Results are presented as a percentage of positive answers to a question; 95% confidence intervals (95% CI) are given.

The computer-based analysis program SPSS (SPSS Inc., Chicago, IL, USA) was used in all calculations. The chi-squared test was used to detect differences between groups,  $p < 0.05$  was considered significant. Multiple logistic regression analysis (forward likelihood ratio) was performed to measure the association between possible risk factors such as age, gender, smoking habits and 'risk occupation' in those 6065 subjects who stated that they were in full- or part-time employment. As nasal symptoms and asthma are known risk factors for eczema, the analysis was performed controlling for these variables. Additionally, an analysis was performed on the total group of those employed in risk occupations. This group was labelled 'aggregated risk occupation'.

## RESULTS

After two reminders, 9316 subjects (78.1%) had returned a completed questionnaire. There were no significant differences in response rates according to gender, age or geographical site.

One-year prevalence of hand eczema among women varied between 1.9 and 10.8%, with the highest figure among those aged 30–39 years. Among men the prevalence figures varied between 2.3% and 5.6%, with the highest figure among those aged 20–29 years. Except in the oldest age group (70–77 years) the 1-year prevalence of hand eczema was higher in women than men ( $p < 0.05$ ) (Table I). Furthermore, in women 1-year hand eczema was related to smoking (10.3% vs 7.2%,  $p < 0.001$ ), but this was not the case among men (4.5% vs 4.5%).

Lifetime prevalence of hand eczema among women varied between 5.7% and 16.7%, with the highest figure among those aged 30–39 years. Among men the

prevalence figures varied between 5.2% and 9.5%, with the highest figure among those aged 20–29 years. Except in the oldest age group the lifetime prevalence of hand eczema was higher in women than men ( $p < 0.05$ ) (Table I). In women, lifetime prevalence of hand eczema was associated with smoking (16.4% vs 12.9%,  $p < 0.01$ ), but not in men (7.0% vs 7.8%, ns).

In the whole population of 9316 subjects, 6065 subjects (65%), aged 20–65 years, were employed full- or part-time. Those not currently in work constituted students, long-term unemployed, old age pensioners and those who were sick-listed.

Of those who were employed full- or part-time, 1106 subjects were identified as having a 'risk occupation' according to Meding & J rholm (2). Of these, 693 subjects were in medical work, 201 subjects in production, and 212 subjects in service. A 'risk occupation' was reported in 10.3% in age group 20–29 years, 24.4% in age group 30–39, 30.4% in age group 40–49 years, 25.8% in age group 50–59 years and 9.1% in age group 60–65 years. Hand eczema was most frequent among women in medical and nursing work.

Using multiple logistic regression analysis, female sex and smoking habits were independent risk factors for reporting 1-year prevalence of hand eczema, whereas age was inversely related to 1-year prevalence of hand eczema. Aggregated risk occupation or occupation categorized as medical and nursing work, production or service was not significantly associated with 1-year hand eczema. However, prevalence of 1-year hand eczema in the medical and nursing working group was significantly higher than in the group with no risk occupation. This was dependent on the increased prevalence in women (Table II).

Table I. Self-reported 1-year prevalence and lifetime prevalence of hand eczema by age group and gender

Age group	Men			Women			Men and women		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
One-year prevalence									
20–29	27 (484)	5.6	3.5–7.6	53 (578)	9.2	6.8–11.5	80 (1062)	7.5	5.9–9.5
30–39	48 (955)	5.0	3.6–6.4	118 (1090)*	10.8	9.0–12.7	166 (2045)	8.1	6.9–9.3
40–49	43 (873)	4.9	3.5–6.4	89 (1014)*	8.8	7.0–10.5	132 (1887)	7.0	5.8–8.1
50–59	49 (1018)	4.8	3.5–6.1	85 (1105)*	7.7	6.2–9.3	134 (2123)	6.3	5.3–7.3
60–69	23 (746)	3.1	1.8–4.3	48 (840)	5.7	4.1–7.3	71 (1586)	4.5	3.5–5.5
70–77	5 (214)	2.3	0.3–4.4	5 (264)	1.9	0.2–3.5	10 (478)	2.1	0.8–3.4
Lifetime prevalence									
20–29	48 (484)	9.5	6.9–12.1	81 (578)	14.0	11.2–16.9	127 (1062)	12.0	10.0–13.9
30–39	79 (955)	8.3	6.5–10.0	182 (1090)*	16.7	14.5–18.9	261 (2045)	12.8	11.3–14.2
40–49	74 (873)	8.5	6.6–10.3	153 (1014)*	15.1	12.9–17.3	227 (1887)	12.0	10.6–13.5
50–59	39 (1018)	5.2	5.8–9.1	152 (1105)*	13.8	11.7–15.8	228 (2123)	10.7	9.4–12.1
60–69	39 (746)	5.2	3.6–6.8	101 (840)	12.0	9.8–14.2	140 (1586)	8.8	7.4–10.2
70–77	13 (214)	6.1	2.8–9.3	15 (264)	5.7	2.9–8.5	28 (478)	5.9	3.7–8.0

The data are given as number, percentage and 95% confidential interval (CI). The number in parentheses is the total study population in each age group.

\* $p$  values  $< 0.001$  for women compared to men.

Table II. Odds ratio (OR) and 95% CI of self-reported 1-year prevalence of hand eczema due to age, gender and smoking controlling for asthma and nasal symptoms (age 20–65 years,  $n=6109$ )<sup>a</sup>

Predictor	OR	95% CI	<i>p</i>
Age	0.99	0.97–0.99	$p=0.012$
Female gender	1.91	1.47–2.47	$p<0.001$
Smoking	1.35	1.04–1.75	$p=0.022$

<sup>a</sup>Risk occupation was not significant, either as aggregated form or categorical as medical and nursing work, production or service. The Hosmer-Lemeshow test for goodness of fit=0.714.

## DISCUSSION

The results of this investigation come from a questionnaire study of cross-sectional design and are based on a large random sample from a general population in southern Sweden. The response rate was high and is likely to be representative for the sample. In this kind of epidemiological study, selection and information bias could possibly influence the risk factor evaluation (10,11). The fact that the number of subjects who reported hand eczema only constituted a small part of the participants makes it unlikely that willingness to respond should be related to hand eczema. The validity of our question 'Have you during the past 12 months had hand eczema on some occasion?' has previously been analysed using subsequent interview and clinical investigation. The sensitivity was 53–59% and the specificity 96–97% (12). Using the same questions in different studies minimizes the methodological bias of results (13).

The observed prevalence figures are higher than those in another prevalence study performed in the same geographical area between 1962 and 1965 (3). However, the study by Agrup (3) was performed mainly in a rural population with questions about 'skin changes' and examination in connection with a large general health survey. Furthermore, that study only assessed the point prevalence.

The 1-year prevalence of hand eczema was lower than reported by two recent Swedish studies (1,2). Decreased exposure to skin irritants or allergens in domestic work at home, leisure time or in occupation is a possible explanation (2,14). Another possible explanation is an increased awareness of regular skin care in the general population (15,16).

In our study female sex was a risk factor for hand eczema (OR=1.91, 95% CI=1.47–2.47). The increased risk for irritant hand eczema in women may be caused by environmental factors such as occupational and non-occupational exposures (1,14,17). The high prevalence figures for hand eczema, especially in young women, have been related to exposure to wet work at home (18).

It has been proposed that genetic factors independent of atopic dermatitis and contact allergy are of importance for

the development of hand eczema (14). However, a genetic risk factor for hand eczema does not explain the increased risk for hand eczema in women.

Experimental studies do not support the proposition that women are more susceptible to skin irritants than men (19). Hand eczema has a negative impact on the quality of life and women seem to report a higher degree of discomfort than men (17).

According to Meding & Järholm, occupational factors may be important predictors of hand eczema (2). We too found that the 1-year prevalence of self-reported hand eczema was highest among those engaged in medical and nursing work. However, when the data were analysed using multiple logistic regression analysis controlling for age, gender, risk occupation and smoking habits, 'risk occupation' did not turn out to be a statistically significant risk factor. The higher prevalence of eczema in the medical and nursing working group was simply due to a high proportion of women in that group.

When analysing the association between risk occupation and hand eczema a 'healthy worker effect' should be taken into account. Subjects with a disposition for hand eczema might avoid or might be advised not to choose risk occupations.

Results concerning an association between hand eczema and smoking are conflicting. In 1988, Edman (20) described an association between smoking and vesicular palmar eczema in Swedish men but not in women. In a recent Danish study, a strong relationship was found between smoking and allergic nickel contact dermatitis in both men and women (21). However, Berndt et al. (22) did not find an association between smoking and hand eczema in metalworker trainees. In our study, smoking was a risk factor for hand eczema independent of gender and age. To our knowledge this is the first population study analysing the relationship between smoking and hand eczema in a general population. Further epidemiological studies and investigations into the possible mechanisms are warranted.

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