Notification of occupational skin diseases by dermatologists in The Netherlands

T. M. Pal1, N. S. de Wilde1, M. M. van Beurden1, P. J. Coenraads2 and D. P. Bruynzeel3

Background A voluntary surveillance scheme of occupational skin diseases (OSDs) in The Netherlands starting in 2001 aimed to improve insight in the incidence of OSD especially occupational contact dermatitis (OCD), risk professions and causal agents. This paper presents the results of this scheme during 2001–05.

Methods Reports of new cases of OSD received from the participating dermatologists on a monthly basis were analysed. Data evaluated included information on diagnosis, sex, age, sickness, absenteeism, profession and causal agents. Relative differences in incidence rates between industries or branches were estimated by calculating incidence rate ratios.

Results About 80% of the notifications concerned OCD. The highest number of notifications was recorded in the first year of the scheme. This was probably due to reporting of a mixture of incident and prevalent cases. During the following 5 years, the number of yearly notifications of OSD declined. Hairdressers, nurses, metalworkers, mechanics and cleaners were the most commonly affected professions. Wet work and irritating substances were the most frequently reported causal agents. Most patients with OCD were not absent from work.

Conclusions A voluntary surveillance scheme with dermatologists provides valuable data about the distribution of OCD in risk professions and the causal agents. However, it has certain limitations in assessing trends in incidence. Active medical surveillance in populations at risk should be encouraged not only to improve secondary prevention but also to obtain more reliable information about the incidence of OCD.

Key words Allergic contact dermatitis; contact allergens; irritants; irritant contact dermatitis; occupational contact dermatitis; occupational skin disease; risk professions; surveillance scheme.

Introduction

Occupational skin diseases (OSDs) belong to the most frequently occurring occupational diseases. The clinical manifestations and consequences vary from mild to serious with temporary or permanent work disability.

Surveillance schemes can be used to gather important information on OSD. First, they can be used for monitoring. Although this is partly dependent on the information reported, a surveillance scheme can supply insight into the incidence and distribution of OSD in various occupational groups. It is also possible to specify causal agents.

By comparing yearly data, the surveillance schemes may show trends.

Second, surveillance schemes may have an alert function. This means that information can be shown about hitherto unknown or unusual causal agents or new occupational groups at risk.

In The Netherlands, there are two OSD surveillance schemes. Since 1999, Dutch occupational physicians (OPs) are obliged to notify new cases of all occupational diseases, including OSD, to The Netherlands Centre of Occupational Diseases in accordance with the Work Conditions Act. However, as there is no compensation conditions for occupational diseases in The Netherlands, reporting is less urgent for the OP.

To obtain more specific information about cases with OSD, the Occupational Skin Disease Surveillance project (ADS project) was initiated in October 2000. The project was based on the EPIDERM surveillance scheme in the UK [1].

In this paper, we present the notification data for this ADS project during 2001–05.
**Methods**

The Netherlands Expert Centre on Occupational Dermatoses recruited a group of 21 Dutch dermatologists with known interest in the field of contact dermatitis. They were asked for monthly reports of new cases of OSD. OSD is defined as ‘a skin disease which, in the opinion of the dermatologist, has been caused by work or which has been made worse by work’. Almost every patient is referred to them by the general practitioner and occasionally by the OP. The dermatologist reported each case on a preprinted reporting card, and data reported included diagnosis, sex, year of birth, place of residence, type of work and causal agent. The collected data changed in January 2002 when in addition to asking for the occupation or occupational activity, the dermatologist was also asked for information about the sector, trade or type of industry the patient was working in. In addition, a question on ‘absence from work’ (yes/no) was added. The dermatologist could also report if the agent was a suspected or proven agent.

The project started in 2001 with 21 dermatologists, in 2002 and 2003 this changed to 26 and in 2004 and 2005 these numbers were 23 and 20, respectively. Over these 5 years, a total of 27 dermatologists (7% of the total number of dermatologists in The Netherlands), participated in the project for the whole period or a part of it. They were geographically spread over the whole of The Netherlands and their catchment population was considered to be a representative sample of the Dutch workforce.

Cases could be classified in eight possible diagnoses. One of these was the category ‘other’. ‘Occupation’ got a code based on a self-developed list of numbers from 1 to 219. In addition, occupations were classified by trades. The code for the agent was based on a shortened list used in EPIDERM [2]. Coding for causal agents started in 2002.

The results mostly are presented in absolute numbers or in percentages of the total. Incidence rate ratios between industries were calculated taking into account the number of employees working in the relevant industry in The Netherlands.

**Table 1.** Total number of reported diagnoses over the years 2001–05

<table>
<thead>
<tr>
<th>Reported diagnosis</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact dermatitis</td>
<td>884</td>
<td>786</td>
<td>803</td>
<td>652</td>
<td>478</td>
<td>3603</td>
<td>79.8</td>
</tr>
<tr>
<td>Contact urticaria</td>
<td>33</td>
<td>22</td>
<td>11</td>
<td>14</td>
<td>14</td>
<td>94</td>
<td>2.1</td>
</tr>
<tr>
<td>Folliculitis/acne</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>23</td>
<td>0.5</td>
</tr>
<tr>
<td>Infections</td>
<td>8</td>
<td>13</td>
<td>12</td>
<td>9</td>
<td>3</td>
<td>45</td>
<td>1.0</td>
</tr>
<tr>
<td>Mechanical trauma</td>
<td>12</td>
<td>8</td>
<td>11</td>
<td>6</td>
<td>7</td>
<td>44</td>
<td>1.0</td>
</tr>
<tr>
<td>Nails</td>
<td>3</td>
<td>10</td>
<td>3</td>
<td>12</td>
<td>3</td>
<td>31</td>
<td>0.7</td>
</tr>
<tr>
<td>Skin cancer</td>
<td>150</td>
<td>83</td>
<td>108</td>
<td>52</td>
<td>38</td>
<td>431</td>
<td>9.5</td>
</tr>
<tr>
<td>Others</td>
<td>41</td>
<td>50</td>
<td>39</td>
<td>53</td>
<td>46</td>
<td>229</td>
<td>5.1</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>0</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>1136</td>
<td>980</td>
<td>993</td>
<td>814</td>
<td>593</td>
<td>4516</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The absolute number of all notifications declined over the 5 years. Even after accounting for the changes in number of reporting dermatologists over this period, an almost 50% decline in number of cases was observed. This decline was largely due to a steep fall from 2001 to 2002 (Figure 1). Between 2002 and 2005, there was less than a 10% decline. Changes in number of notifications of contact dermatitis accounted almost entirely for the total decline, but from 2001 until 2005 fewer cases of skin cancer and contact urticaria were reported and these changes paralleled those of contact dermatitis.

The dermatologists returned 88% (2001) to 95% (2004) of their cards. Overall, this amounted to 90% over 4 years.

Of all notified cases with contact dermatitis in 2001–05, 51% were women and 49% were men. Women predominated in the youngest age groups (15–24 and 25–34), with men being represented more commonly in the older groups (35–44, 45–54, 55–64).

The age distribution showed a peak in women aged 15–24 years (Figure 2). In contrast, most cases of men are seen in the middle age categories (25–34 and 35–44 years). The younger the age groups of female cases, the more they differed from the age distribution of the female workforce in The Netherlands in 2004. The age distribution of male cases corresponded to those of the male workforce (figures from national statistics CBS).

The five most commonly reported occupations in cases with contact dermatitis were the same every year, but not necessarily in terms of frequency (Figure 3). Hairdressers were the most commonly reported occupation annually, followed by the nurses. Their decline in number of notifications between 2001 and 2005 paralleled each other. The number of mechanics increased slowly, and in 2004 they were second most commonly reported. Cook, catering worker, horticulturist, florist, shop assistant and nail stylist belonged to the 10 most reported occupations in this reporting period.

When the occupations are classified into industries or trades, 16% of the notifications were individuals working.
in the health and welfare care sector, 13% in cosmetics and hygiene, 13% in metal industry (including car repair), 11% in food industry, 8% in agriculture, 7% in cleaning (domestic, industry) companies and 7% in the building industry. The contribution of notifications from the metal industry increased between 2001 and 2004 from 11.5 to 15.0% and declined in 2005 to 12.3%. The contribution of notifications from agriculture showed a steadily decline from 9.4% in 2001 to 6.7% in 2005. Percentages of health and welfare care reports fluctuated but did not show a trend.

Incidence rate ratios (Table 2) indicated that hairdressers were especially at risk, and the risk in agriculture work was higher than expected from the absolute numbers. Irritant factors (wet work, irritating chemicals and mechanical factors) were by far the most common reported causal agents (Figure 4), with a strong decline in reporting of wet work as a causal factor in 2004.

Looking at the most reported allergens as causal agents (Figure 5), there was a steady decline of hairdresser’s products corresponding to the decreasing number of cases of hairdressers. The exception was preservatives which increased by 19% until 2004, although other allergens were less frequently reported in the reporting period.

Only 28% of individuals indicated that they were absent from work because of their skin problem when visiting the dermatologist for the first time.

Discussion

In this 5 year period of the ADS project, the number of reported cases of contact dermatitis declined even after accounting for the variation in number of participating dermatologists. Contact dermatitis constituted 80% of the reported diagnoses. The most frequently reported occupations were hairdressers and nurses (respectively, 10 and 9%). Wet work and irritative factors were most frequently mentioned as causal agents. Within the group of reported causal allergens, hairdressing products, preservatives and rubber chemicals were the most frequently mentioned.

As in other voluntary surveillance schemes, reliable reporting is dependent on sustaining enthusiasm and discipline in the participants. The peak in notified cases in the first year might point to this enthusiasm in starting a new
The incidence rate of contact dermatitis was recognized and reported by the dermatologist will be. However, not all cases seen by dermatologists are likely to be a mixture of incident and prevalent cases. This also means that the incidence rate of contact dermatitis of 1.8/1000 workers calculated with the data of 2001 may be an overestimation. This estimated incidence rate corresponds to the upper limit given by Diepgen and Coenraads [3] but is much higher than those calculated from the surveillance scheme of EPIDERM and OPRA [1]. Based on notified cases in Denmark, USA and Bavaria, an incidence rate of 0.8/1000 was calculated [4] which correlates with the incidence rates calculated for the later years of the surveillance project. However, both voluntary schemes and notification schemes for legal compensation claims are supposed to underreport the number of incident cases [4]. Furthermore, not all patients with work-related contact dermatitis visit a dermatologist and not every case seen by the dermatologist will be recognized and reported.

Although OPs in The Netherlands are obliged to notify new cases of occupational diseases, they report yearly only between 150 and 250 cases of contact dermatitis with a decreasing tendency [5]. Also in the EPIDERM and OPRA [2], there were fewer cases of OSD reported by OPs when compared to dermatologists. However, incidence rates in more recent data of these surveillance schemes were much higher for the reporting OPs than those calculated for dermatologists [6]. The lower number of notifications by OPs compared to dermatologists in The Netherlands is explained by the fact that in most workers contact dermatitis is not accompanied by sickness absence. These patients are therefore not generally seen by OPs. In The Netherlands, OPs spend most of their time on advising on sickness absence, and in most companies workers are not familiar seeing their OP if not absent from work, especially in small companies which have limited OP access.

Because of the health insurance system in The Netherlands, there are no differences in access to the dermatologist between various social class groups, occupations, industries or employment status. This makes a surveillance scheme for dermatologists more attractive than a scheme for OPs. However, monitoring trends in incidences by the presented descriptive statistical approach is hampered by reporter fatigue [7], relatively small number of participating dermatologists and lack of information of the catchment population. To improve the discovery of new cases of contact dermatitis, OPs in The Netherlands now are encouraged to carry out active medical surveillance in workers at risk with the help of a recently adopted guideline [8].

In the ADS-project, the age distribution of men peaked in the middle age categories (25–34 and 35–44 years). A peak in women aged 15–24 years was due to notifications in hairdressers and nurses. In other studies, contact dermatitis is also found in female cases in the younger age groups in hairdressers and nurses. In other studies, contact dermatitis is also found in female cases in the younger age groups (15–24 years) [9,10]. The same trends are seen in the EPIDERM study [2].

As already mentioned, incidence rates of contact dermatitis within certain professions or trades could not be calculated or estimated because of the lack of specific data on the catchment populations of the participating dermatologists. Therefore, a ranking of proportional incidence ratios is possible by accounting for the number of people working in the various trades on a national scale. Presenting the results in this way, hairdressers still remain the highest risk profession, but workers in the food and catering industry demonstrate a higher risk and health care workers a lower risk than when compared by ranking with the absolute numbers. The risk in health care workers may be underestimated because the denominator of all people working in health care is much greater than the real population at risk. In fact, the differences in some ratios are comparable with those calculated from the incidences rates in various professions in Germany [11,12].
to be the result of various preventive measurements. Similarly, in The Netherlands over the last few years much attention has been paid to the implementation of a preventive policy for skin problems in certain professions. Important stimuli were the Safety and Health Covenants between government, employers and employees in 2001 for hairdressers and nurses. These covenants contain recommendations about information systems about products, protection of the skin, advice for employees and employers about risks and development of expertise and intervention. The declining number of notifications of hairdressers and nurses in our surveillance scheme which is more obvious than in mechanics, metalworkers and cleaners might indicate the effectiveness of that policy.

Wet work was by far the most frequently mentioned cause of contact dermatitis indicating that within occupational contact dermatitis (OCD) the incidence of irritant contact dermatitis (ICD) is much higher than allergic contact dermatitis (ACD). Besides an irritant factor as the main cause, in several cases an allergen was also reported as second causal agent. Actually these cases are combined cases of ICD and ACD. Practically, all cases of dermatitis had been patch tested. However, some underreporting of ACD is possible when the case has been notified before the results of patch testing were known. The difference between irritant factors and allergens seems to be more prominent in our data compared to data of other surveillance schemes [2,13]. Hence, emphasizing the importance of implementing skin care management programs in employees at high risk for development of ICD [14]. A number of intervention studies demonstrated promising results with skin care programs in different risk groups [15–17].

In terms of allergens, there are some differences in the trends between those most often reported (Figure 5). The decline in hairdressing products and notifications of latex allergy might point to the effectiveness of preventive measures. A substantial number of cases of acrylate allergy are due to the use of acrylates by nail stylists. In response to this observation, the trade has been informed about the risks and the need for taking preventive measures. Although after a peak in 2002, fewer notifications were made in the following years, the nail stylist remains the most important occupational group besides dental technicians and dental assistants.

Preservatives are present in most water-based products like liquid soaps, cosmetics, metalworking fluids and because of the replacement of organic solvents increasingly more in paints and glues. Indeed hairdressers, mechanics and metalworkers are the most often named professions in notifications of allergy by preservatives (data not shown) but we did not see an increase in painters or furnishers. The fall of notifications of preservative allergy in 2005 was largely explained by a decrease in notifications in hairdressers, mechanics and metalworkers. Besides the already mentioned nail stylists, up until now our surveillance scheme did not reveal new risk professions or novel causes.

We conclude that a voluntary surveillance scheme like the ADS project has various limitations in monitoring incidences but can deliver valuable data on distribution and causes of OSD in various professions and trades. An important prerequisite is the sustaining willingness and discipline in reporting.

Because workers with OCD are generally not absent from work, active surveillance of populations at risk should be encouraged not only to improve secondary prevention but also to obtain more reliable information about the incidence.

**Key points**

- A voluntary surveillance scheme by dermatologists delivers valid data on distribution and causes of OCD between various occupational groups.
- Because of underreporting in voluntary schemes, active surveillance within occupational groups at risk is necessary to receive reliable data of the incidence of OCD.
- Reducing exposure to wet work and improving skin care management are most important in preventing OCD.

**Acknowledgement**

The authors are indebted to the dermatologists who participate in the ADS project for their willingness in reporting every month the requested data of their new cases.

**Funding**

The ADS project is funded by the Dutch Ministry of Social Affairs and Employment.

**Conflicts of interest**

None declared.

**References**


