

Occupational skin diseases in Singapore 2003–2004: an epidemiologic update

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In this 2-year retrospective epidemiologic study of occupational skin disease in Singapore, there were 125 patients with occupational contact dermatitis. The mean age of patients was 33.8 years, with a male to female ratio of 5.3:1. Irritant contact dermatitis made up 62.4% of all cases, whereas allergic contact dermatitis constituted 37.6%. Wet work/detergents, oil/grease and solvents remained the 3 commonest irritants. There was also a significant increase in representation of workers from the food/catering industry in our study.

Key words: allergic contact dermatitis; epidemiology; irritant contact dermatitis; occupational; Singapore. © Blackwell Munksgaard 2007.

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Occupational skin disease (OSD), in particular occupational contact dermatitis (OCD), remains an important cause of work-related disability and a common cause of absence from work. The epidemiology of OSD varies between countries as well as within the same country over time. Changing employment trends, changing demographic profiles of workers and availability of better patch testing tools are some of the contributory factors. Periodic update of the epidemiology enables preventive measures to be instituted early. This is a retrospective epidemiologic study of OSD in Singapore over a 2-year period 2003–2004. It provides an update of the epidemiology and the common causative agents of OSD seen at a tertiary dermatology referral centre in Singapore, the National Skin Centre.

Patients and Methods

All patients diagnosed with occupational dermatoses attending the Contact and Occupational Dermatoses Clinic at the National Skin Centre from January 2003 to December 2004 were included in our study. Criteria for diagnosis of OSD were based on definition proposed by the American Medical Association, i.e. it is a pathological condition of the skin for which occupational exposure can be shown to be a major causal or contributory factor.

Demographics of these patients were recorded. All patients were patch tested to our standard

series and additional allergens where relevant. Patch testing was done according to the protocol recommended by the International Contact Dermatitis Research Group. Allergic contact dermatitis (ACD) was confirmed on a relevant positive patch test, while irritant contact dermatitis (ICD) was diagnosed on circumstantial evidence from clinical history, examination and chemicals exposure, together with a negative patch test.

Results

125 patients were diagnosed with OSD during the study period. All had OCD. The mean age of the patients was 33.8 years (range, 18–62 years). The male to female ratio was 5.3:1. Among the patients, 57.6% were Chinese, 7.2% Malays, 17.6% Indians and 17.6% were of other races, which included Thais and Bangladeshis.

ICD is still more common than ACD. ICD made up 62.4% of all cases and ACD constituted 37.6%. 7 patients had both ICD and ACD, and they were classified under ACD. 1 patient had contact urticaria to food and another had contact urticaria to rubber gloves. Both were considered under ACD.

Table 1 shows the industrial sources of occupational dermatitis in this study. ICD was more common than ACD in most industries. Common industrial irritants and allergens are shown in Table 2. The commonest occupational irritants and allergens for the top 3 commonest sources of our

Table 1. Industrial sources of occupational dermatitis in Singapore 2003–2004

	ACD	ICD	Total, <i>n</i> (%)
Building/construction	28	17	45 (36)
Metal/engineering	9	17	26 (20.8)
Food/catering	3	17	20 (16)
Military/defence/conscript	0	8	8 (6.4)
Chemical/petrochemical	1	6	7 (5.6)
Electrical/electronics	2	4	6 (4.8)
Cleaning/laundry	0	3	3 (2.4)
Health/pharmaceutical	2	1	3 (2.4)
Plastics/fibreglass	1	1	2 (1.6)
Transport	0	1	1 (0.8)
Electroplating	1	0	1 (0.8)
Others	0	3	3 (2.4)
Total	47	78	125 (100)

ACD, allergic contact dermatitis; ICD, irritant contact dermatitis.

occupational dermatoses are shown in Table 3. Table 4 shows the demographic profiles of affected workers from the 3 commonest sources of occupational dermatoses.

Discussion

The incidence of OCD diagnosed in our centre showed a continued decline from 262.5 cases/year in 1984–1985 (1) and 93.8 cases/year in 1989–1998 (2) to 62.5 cases/year in our present study. Cases of OCD notified under the national Workplace Safety and Health regulation were routinely referred to our centre for patch testing throughout the above study periods. This lends support that there was a decline in cases of OCD diagnosed locally, a trend which was also observed in other countries (3, 4). Better working environment, increased awareness among employers or workers

Table 2. Common occupational irritants and allergens in the workers with contact occupational dermatitis (note some workers had more than 1 irritants or allergens)

	<i>n</i>	Percentage
Irritants	<i>n</i> = 78	
Wet work/detergents	25	32.1
Oil/grease	22	28.2
Solvents	14	17.9
Cement	11	14.1
Coolants/soluble oil	7	9.0
Food ^a	4	5.1
Resins ^b	3	3.8
Allergens	<i>n</i> = 47	
Chromate	28	59.6
Rubber chemicals ^c	7	14.9
Cobalt	6	12.8
Resins ^b	6	12.8
Nickel	3	6.4
Colophony	2	4.3
Food ^a	2	4.3

^aPrawn, lobster, fish and meat tenderizer.^bEpoxy, acrylate and formaldehyde resins.^cThiuram, mercapto/mercaptobenzothiazole and carba mix.

Table 3. Occupational irritants and allergens in the 3 industries most commonly affected by occupational dermatoses in Singapore, 2003–2004 versus 1989–1998

	2003–2004	1989–1998
Irritants		
Building/construction	<i>n</i> = 17	<i>n</i> = 44
Cement	10 (58.8%)	23 (52.3%)
Solvents ^a	4 (23.5%)	4 (9.1%)
Oil/grease	2 (11.8%)	6 (13.6%)
Wood/fibreglass	1 (5.9%)	NA
Metal/engineering	<i>n</i> = 17	<i>n</i> = 121
Oil/grease	6 (35.3%)	42 (34.7%)
Coolant/soluble oil	6 (35.3%)	50 (41.3%)
Solvents	4 (23.5%)	21 (17.4%)
Wet work	2 (11.8%)	NA
Food/catering	<i>n</i> = 17	
Wet work/detergents	16 (94.1%)	NA
Food	5 (29.4%)	NA
Oil/grease	3 (17.6%)	NA
Allergens		
Building/construction	<i>n</i> = 28	<i>n</i> = 110
Chromate	19 (67.9)	70 (63.6%)
Chromate/cobalt	4 (14.3%)	20 (18.2%)
Resins ^b	3 (10.7%)	NA
Chromate/thiuram	2 (7.1%)	8 (7.3%)
Metal/engineering	<i>n</i> = 9	<i>n</i> = 36
Colophony ^c	2 (22.2%)	NA
Chromate	2 (22.2%)	3 (8.3%)
Rubber chemicals ^d	2 (22.2%)	5 (13.9%)
<i>p</i> -Phenylenediamine	1 (11.1%)	NA
Food/catering	<i>n</i> = 3	
Food	2 (66.7%)	NA
Nickel	1 (33.3%)	NA

NA, not available for comparison.

^aVarnish, turpentine, acetone and spray paint (chemical name not available).^bEpoxy and acrylate resins.^cSoldering flux.^dThiuram, mercapto/mercaptobenzothiazole and carba mix.

and tighter legislations may contribute, but it is uncertain if the peculiarity of our study period (occurrence of severe acute respiratory syndrome in 2003) was a significant factor. Further surveillance is therefore needed.

The main occupational irritants remained unchanged, namely wet work/detergents, oil/grease and solvents, but the proportion of workers affected by ICD to cement showed a significant increase from 3.9% (in 1989–1998) to 14.1% in

Table 4. Demographic profile of workers in the 3 industries most commonly affected by occupational dermatoses

Demographics	Building/construction	Metal/engineering	Food/catering
Mean age (years)	32.8	34.4	36.9
Male:female ratio	All males	7.1:1	1.9:1
Ethnicity, <i>n</i> (%)			
Chinese	11 (24.4)	19 (73.1)	18 (90)
Malay	2 (4.4)	—	1 (5)
Indian	15 (33.3)	3 (11.5)	1 (5)
Others	17 (37.8)	4 (15.4)	—

our current study. This is related to a higher proportion of workers from the building/construction industry (36% versus 16.2%), but it also highlights the need for continual education of workers and employers in this industry.

Chromate, cobalt and rubber chemicals were the commonest occupational allergens. This is in contrast to chromate, rubber chemicals and nickel in the previous 2 studies. Resins, colophony and food showed no increase in significance but remained as important occupational allergens.

Food/catering industry had replaced electric/electronic industry as the third commonest source of OSD in Singapore. The findings of a 3.4% increase in employment in the local food and beverage service industry in 2003 (5) and the increased representation of workers from this industry in our study (16% compared with 9.6% in 1989–1998) support the role of surveillance of changes in employment trend to reduce the burden associated with occupational dermatoses. The mean age of the affected workers in this sector did not differ significantly from workers of the other industries, but there was a weaker male predominance. This may, however, be a reflection of the inherent sex distribution of workers in the various occupational groups. Almost all workers from the food/catering industry suffered ICD to wet work/detergent, suggesting a lack of awareness in workers of this rapidly growing industry.

There were significantly more workers suffering from ACD than ICD in the building/construction industry. The allergens most commonly tested positive were chromate and cobalt, with cement being the most common source in these workers. Cement was also the main irritant. The percentage of patients suffering from ICD to oil/grease showed no major change from the previous years, but ICD to solvents appeared to have become a more significant problem. The solvents involved were varnish, turpentine, spray paints and acetone.

Common irritants in metal/engineering industry were still oil/grease, coolants/soluble oil and

solvents. Wet work, in the form of frequent hand washing during work, was also an important cause of ICD in this industry. There was also a significant proportion of patients with relevant ACD to colophony in soldering flux in these workers.

Conclusion

There had been a remarkable 24% decline in the number of OCD cases diagnosed at our centre over the past 20 years. Contact dermatitis is still the most common occupational dermatosis in Singapore. ICD is more common than ACD. Wet work/detergents, oil/grease and solvents remained the 3 commonest irritants, whereas chromate, cobalt and rubber chemicals were the commonest occupational allergens. Building/construction, metal/engineering and food/catering industries were the commonest source of occupational dermatitis.

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