



MANAGING OCCUPATIONAL SKIN DISEASE

By Dr Anthony Goon

This is part of a series on workplace safety and health for healthcare institutions.

A 35-year-old foreign worker presented with itchy rash on the hands, which persisted for five months. On examination, he had scaly fingertips with subungual hyperkeratosis. His job involved making toilet flooring comprising polyester flakes between two layers of epoxy resin. After cleaning the floor with acid, he mixed epoxy resin with a hardener and applied the mixture with a roller brush. He did not wear gloves while working. He was patch tested at the Joint Occupational Dermatitis Clinic (JODC) and found to have allergic contact dermatitis to epoxy resin. Permanent transfer to duties not requiring contact with epoxy resin was recommended.

Introduction

Occupational skin diseases or occupational dermatoses, are pathological conditions of the skin where occupational exposure can be shown to be major causal or contributory factors. In many occupations, the skin is exposed to damaging agents such as chemicals, biological materials and mechanical and physical forces. The susceptibility of an individual's skin to damage, as well as its ability to recover, varies from one person to another. Occupational dermatoses develop if the balance

between the skin's repair ability and the damaging forces is disturbed.

The majority of cases present with contact dermatitis, although other morphological presentations, which are less common, may also be seen. Other non-eczematous contact dermatitis reactions may resemble various skin disorders such as erythema multiforme, lichen planus, pigmentary disorders or purpuric lesions. Besides contact dermatitis, other occupational dermatoses include miliaria, folliculitis and acneiform eruptions, pigmentary changes, occupational

cancers, occupational infections and occupational connective tissue diseases. Pre-existing skin diseases may also be aggravated by occupation, for example, lichen planus may develop koebnerization due to mechanical forces. With that said, our article will focus on the topic of contact dermatitis in the discussions below.

Patients usually present with eczematous lesions over exposed parts of the body (eg, the limbs, face or neck). The hands are involved in 80% to 90% of cases. The commonly affected areas are those parts of the skin which are



Pictures above Erythematous scaly fingertips with subungual hyperkeratosis

Photos: National Skin Centre

in contact with chemicals and work processes. Besides the hands and forearms, the feet and legs are the next most affected body parts. The face may also be affected by airborne irritants and allergens. Dust particles can also find their way onto areas covered by clothing such as the armpits and the waistline. The majority of occupational contact dermatitis cases are irritant contact dermatitis, while many cases of allergic contact dermatitis are also noted.

Suspected cases of occupational skin disease are investigated at the JODC in National Skin Centre (NSC). This clinic is jointly run once a month by dermatologists from NSC and occupational physicians from the Ministry of Manpower (MOM). Patients undergo detailed history-taking, clinical examination and targeted testing. Patch tests are usually performed, while skin prick, photopatch and use tests are also done, though less commonly. In rare cases, special tests and chemical analyses may also be needed. Workplace visits may be conducted for some cases to assess possible exposures.

Contact dermatitis

Contact dermatitis usually presents with eczematous lesions. These may be acute (erythema, vesicles, exudation), subacute (erythema, scaling) or chronic (lichenification, fissures, hyperpigmentation, hypopigmentation).

A detailed occupational history must be obtained during consultation

(refer to Table 1). It should include job title, work activities, material handling techniques, substances handled, protective clothing and equipment, and hygiene measures. Information about the onset of rashes, new job materials and processes, whether other workers are affected, improvement on days off, sick leave taken, atopic background, treatment thus far, domestic exposure and hobbies must also be obtained.

Examination is aimed at distinguishing occupational skin diseases from non-occupational ones. It is also important to identify non-eczematous occupational skin diseases and endogenous dermatitis. Patients need to be adequately exposed in a well-lit room for thorough examination. Sometimes, risk factors may be identified during clinical examination (refer to Table 2).

Further information can be obtained from the employer in the form of safety data sheets for the work substances handled. If a contact allergen is suspected, samples of work chemicals/materials handled or personal protective equipment (PPE) used by the worker should be obtained for patch or prick testing.

Irritant contact dermatitis is caused by irritants such as biological or synthetic chemical compounds, and physical and mechanical forces that may directly damage the skin. Strong irritants such as strong acids, strong alkalis and strong solvents, cause acute irritant contact dermatitis, which may range from a mild erythematous

irritation reaction to florid dermatitis with oedema, inflammation, pain and vesiculation. Weaker irritants such as weak acids, weak alkalis, detergents and water may cause cumulative irritant contact dermatitis as a result of a series of repeated damaging insults to the skin. All individuals, especially those who are more susceptible (eg, atopic), may develop irritant contact dermatitis with sufficient exposure.

Allergic contact dermatitis is caused by allergens such as biological or synthetic chemical compounds that induce an allergic response in the skin. This is typically a cell-mediated- or delayed-type immune reaction. It is an idiosyncratic reaction to a specific allergen and never occurs on the

Table 1: History taking

A comprehensive history includes the following:

- Job title with indication of work undertaken.
- Duration of employment.
- Location and distribution of rash.
- Onset and exacerbation of rash in temporal relation to workplace exposure.
- Effect of weekends or vacations on rash onset and severity.
- Other colleagues affected.
- Substances handled.
- Use of barrier creams, cleansers, gloves and boots.
- Personal and family history of atopy.
- Part-time jobs, hobbies and housework.
- Treatment received so far.
- Previous allergies.

Table 2: Helpful hints during clinical examination

- History of contact with agents known to have produced skin rashes at place of work (eg, epoxy resin).
- Occurrence of rash in fellow workers.
- Distribution and morphology of lesions consistent with information of exposure to contactants.
- Rash clears with cessation of contact with agent but reappears with re-exposure.
- Non-occupational causes excluded.
- If the suspected contactant is a known allergen, patch testing is helpful.

first exposure, as sensitisation has to occur prior to elicitation of the allergic reaction. Common allergens include nickel, fragrance and chromates.

The commonest occupational irritants in Singapore are detergents/wet work, solvents, oils/grease and coolants/soluble oils. The most common occupational allergens in Singapore include chromates (in cement), rubber chemicals (from rubber gloves and boots), nickel (in metalworking industries) and resins (epoxy, acrylate and formaldehyde resins).

Identifying and treating contact dermatitis

Patch testing attempts to reproduce a small patch of allergic contact dermatitis using suspected allergens suspended in a vehicle at non-irritant concentrations. Hence, it is used to confirm allergic contact dermatitis. However, it cannot be used to prove irritant contact dermatitis if negative. Irritant contact dermatitis may be diagnosed on evidence from the clinical history, examination and chemicals handled, together with a negative patch test. Prick testing is used to confirm contact urticaria.

Sometimes, a workplace visit may be necessary to assess the work conditions, to screen other workers or to better understand the work processes. After the diagnosis of an occupational dermatosis has been made, the aim is

to rehabilitate the worker. The primary consideration is to get the worker back to work as soon as possible, and at the same time, prevent a relapse. Sometimes, a temporary transfer to different duties with no exposure to the offending substance or work process may be required.

A permanent job change is to be avoided as far as possible, as this would require retraining at great expense to both the worker and employer. However, this may be unavoidable in cases with allergic contact dermatitis, as even minimal exposure may result in relapses. In some cases, such as with chromate allergy, improvement may not be achieved even with complete avoidance of the allergen. Thus, the affected workers sometimes opt to remain in their jobs despite the skin disorder in order to avoid salary reduction or changing to a less desirable job. Occasionally, continual exposure to occupational irritants or allergens may actually result in tolerance.

Preventing recurrences

Preventive measures are important in the management of occupational dermatoses. If the causative agent is not identified and exposure continues, the patient's rash may persist or worsen despite medication. Prevention should be targeted towards prevention of recurrence in the patient as well as prevention of disease among other workers.

Preventive measures include modification of the work environment. This may be effected by elimination or substitution of the offending agents, or institution of protective measures to avoid contact with these agents, eg, local exhaust ventilation systems, PPE or enclosed work processes. Other measures may be to avoid hiring susceptible workers (eg, those with atopic dermatitis) in high-risk occupations (eg, those requiring regular wet work), worker education, proper skin cleansing and the use of emollients after work.

Conclusion

Singapore, like most countries, imposes a statutory requirement for the mandatory reporting of occupational diseases, where the employer and doctor have the responsibility to notify MOM. Occupational skin diseases are one of the reportable occupational diseases prescribed in the Workplace Safety and Health Act. Notification and data collection help in the identification of persons and industries at risk, to better manage workplace hazards and also help injured workers in compensation claims. Notification can be done electronically at iReport (<http://www.mom.gov.sg/ireport/>).

With that said, occupational dermatoses pose a significant health problem to the working population. Proper management requires close cooperation between occupational physicians, dermatologists, employers and the employees themselves. ■



Dr Anthony Goon is a senior consultant and current head of the Contact Dermatitis Clinic and JODC at NSC. He obtained his PhD in medical sciences with focus in dermatology from Lund University, Sweden in 2010, with his thesis on contact allergy to acrylates.

Online course on basic WSH for healthcare workers

The Workplace Safety and Health Council have developed a workplace safety and health (WSH) course for healthcare staff to better equip themselves with basic workplace safety and health knowledge, such as the WSH Act and its regulations, common hazards at workplaces, control measures, as well as commonly used safety signs at workplaces. To try out the online course, visit <http://goo.gl/ye5DVC>.