Occupational contact dermatitis

Background

OCCUPATIONAL skin disease is commonly listed as one of the top three occupational disorders in developed countries and is responsible for about 30% of all occupational diseases worldwide. Occupational skin disorders affect workers of all ages in a variety of settings and have considerable medical, occupational, financial and quality of life consequences for those affected and their families. Occupational contact dermatitis constitutes up to 90% of all occupational skin diseases, with the remaining contributors being infections, neoplasia, folliculitis/acne, and mechanical or traumatic causes. This article focuses on the different types of occupational contact dermatitis. Occupational contact dermatitis usually affects the hands, although other exposed areas such as the face and arms, and occasionally the feet, may be affected. The terminology used is confusing. In Australia the term ‘eczema’ is usually applied to describe endogenous disease, while ‘dermatitis’ or ‘contact dermatitis’ refers to exogenous disease from substances contacting the skin. Contact dermatitis comprises two major subgroups: irritant and allergic contact dermatitis (ICD and ACD). Contact urticaria is another form of the condition.
Types of contact dermatitis

Irritant contact dermatitis

This condition represents about 80% of occupational contact dermatitis and is considered the most frequent cause of skin problems affecting the hands (figure 1). In the past it has been considered a non-immunological process but multiple mechanisms are now recognised in the pathogenesis of ICD, involving a combination of exogenous and endogenous factors. It is thought that physical and/or chemical irritants trigger a pathological cascade of skin barrier disruption, epidermal cellular damage and pro-inflammatory cytokine release from keratinocytes, as occurs in ACD.

Unlike ACD however, prior sensitisation is not required and there appears to be no immunological memory component.

ICD may be acute, commonly the result of a single exposure to a potent irritant such as a strong acid or alkali. Kneeling in wet cement, which is very alkaline and irritating to the skin, resulting in burns, is a typical example of an acute irritant reaction.

Chronic ICD is much more common than the acute form. This condition usually develops as a result of cumulative exposure to multiple irritants, resulting in disruption of the skin barrier function. One of the most common exogenous irritants implicated in chronic ICD is ‘wet work’, defined as exposure of the skin to liquids for more than two hours a day, wearing occlusive gloves for more than two hours a day or frequent handwashing, that is, over 20 times in a shift. Persons undertaking considerable wet work have at least a twofold risk of developing occupational contact dermatitis. It may typically start with dryness in the web spaces between the fingers, progressing to inflammatory changes.

ICD can be severe enough to require job modification or even job change if the patient is not responsive to treatment.

Allergic contact dermatitis

This condition is a Type 4 delayed (T-cell mediated) hypersensitivity response to an allergen. This can develop at any time, even after years of exposure or contact with a substance. Unfortunately, once established, hypersensitivity to an allergen is lifelong. ACD involves an initial sensitisation phase that takes between three days and several weeks to occur after exposure to an allergen. The next phase occurs when the individual is subsequently re-exposed to the allergen resulting in the manifestation of dermatitis at the site of contact within 1-2 days. With frequent re-exposure there may be no time for healing to occur before the next contact, which can frustrate attempts to diagnose the offending allergen on history.

Some chemicals are not capable of inducing an allergic reaction because of their molecular size or structural characteristics. For example, solvents virtually never cause allergic contact dermatitis. Contact allergens that are able to elicit a response are low molecular weight chemicals known as ‘hapten’, which are able to penetrate the stratum corneum of the skin. Once they gain access to the epidermis they form a complex with a protein. The ‘hapten-protein complex’ must be internalised and processed by epidermal Langerhans cells for presentation to responsive T lymphocytes in regional lymph nodes followed by subsequent immune activation. Variations within these processes may be sufficient to prevent sensitisation from occurring.

Pre-existing skin barrier damage and ICD may promote the subsequent development of skin sensitisation and so ICD therefore predisposes individuals to the development of ACD. It is important to recognise that both diagnoses often co-exist in the one patient. An example of this is cleaners who do not wear gloves until after the development of ICD and who subsequently develop ACD from rubber accelerators in their gloves. Hairdressers are at special risk as they initially perform a large amount of wet work as apprentices but are subsequently exposed to hair dyes, bleach and perming solutions, all of which are potent sensitisers.

Contact urticaria

Contact urticaria accounts for 1-8% of reported cases of occupational contact dermatitis. It is an immediate Type 1 allergic response. This occurs as a result of contact with the relevant substance (usually a protein in a foodstuff or natural rubber latex). Commonly it presents as itching and redness of the skin but several other symptoms may occur, including rhinitis, asthma and even anaphylaxis.

Repeated episodes of contact urticaria may result in the development of ‘protein contact dermatitis’ which is similar to ACD but precipitated from ICD and ACD. Risk factors specifically for latex allergy include exposure to latex products (particularly use of powdered disposable gloves), atopy and decreased skin barrier function that occurs with contact dermatitis. Formally powdered disposable latex gloves have all but disappeared from the acute healthcare setting but are still available in other workplaces.

Risk factors

Endogenous risk factors

Pre-existing skin disease and atopy

PRE-EXISTING skin disease including any type of dermatitis leads to altered skin barrier function and increases the skin penetration of various irritants and allergens. A personal history of skin atopy, including atopic eczema as a baby — even without ongoing disease — has been associated with a greatly increased risk of occupational contact dermatitis.

There is also a slightly higher risk of occupational contact dermatitis in people who have a history of mucosal atopy (ie, asthma or hay fever) or a family history of atopy. Intrinsic factors and immunosuppressant reac-

tions, such as contact urticaria to latex and food proteins, are also more common among atopic individuals.

People with a history of hand eczema which may not be related to atopic eczema are also at risk of occupational contact dermatitis. It can be clinically quite difficult to assess the contribution of endog-

eous, as opposed to exogenous, factors.

Age

A higher percentage of young workers are affected by occupational contact dermatitis. This is because younger workers are more likely to be exposed to skin irritants in the workplace, particularly in areas such as hospitality and hairdressing.

Cutaneous susceptibility to irritants has been reported to decrease with age, with less penetration of substances through the skin occurring with older years.

Gender

Women have a higher incidence of ICD. While this may be caused by an inherent increased susceptibility it is more likely due to the fact that women are more frequently exposed to cutaneous irritants than men. Women predominate in occupations involving wet work such as hairdressing and nursing, as well as often having more non-occupational exposure to household irritants.

Body site

The stratum corneum has varying thicknesses at different anatomical sites. Therefore, there is differing propensity for skin penetration and skin irritation. For example, the face, dorsum of hands and finger web spaces are significantly more permeable than the palms, soles or back. As a result, they are more prone to irritation.

Exogenous risk factors

Environmental and physical factors

One’s environment can contribute to the development of contact dermatitis. Factors such as ambient temperature, humidity, UV irradiation and the presence of dust and fibres are implicated in the development of disease. For example, hot and humid environments cause perspiration, which is thought to solubilise chemicals that come in contact with the skin, allowing them to penetrate more easily. Conversely, low-humidity environments are thought to cause skin dryness and subsequent disruption of the epidermal barrier.

Physical and mechanical factors such as friction, occlusion (ie, prolonged wearing of gloves) pressure and vibration are also important factors.

Workplace culture

Workplace culture certainly impacts upon the development of contact dermatitis. If the workplace culture is focused towards prevention of disease, workers are less likely to be exposed to hazardous chemicals, personal protective equipment is more likely to be used appropriately.

Over recent years there has been an increased focus on the employer’s responsibility towards the health and safety of the workplace and that workers comply with safety procedures.

Occupation

The ranking of the high-risk occupations varies from country to country depending upon existing industries and workplace practices. Hairdressing, food handling, nursing and mechanical work are common high-risk industries in most areas (see box, left).
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**Common causes**

IRRITANT contact dermatitis is two or three times more common than ACD. The most common cause of ICD is wet work that involves repeated exposure to water and/or soaps and detergents followed by contact with solvents, oils and greases as well as physical factors such as sweating, heat, dust, friction and low humidity. It is important to recognise that ICD is usually multifactorial and identifying one cause is often not possible.

The most commonly reported occupational allergens causing ACD vary depending upon the nature of the workforce of the referral population. The box, right, lists the most common allergens detected at the Occupational Dermatology Clinic in Melbourne.

The most common allergen was found to be thiuram-related chemicals, which are rubber accelerators and vulcanisers and used in the manufacture of rubber products including rubber gloves. Chromates are found in cement and are also used to tan leather. It has been observed that ACD caused by chromate may persist for some time even after avoidance of the allergen.

Hairdressing allergens such as hair dyes (paraphenylenediamine), bleach and perming solutions such as ammonium persulfate and glycerald monothioglycolate cause significant problems in that industry. Paraphenylenediamine has also been an important cause of sensitisation in so-called paint-on temporary “henna tattoos” which are in fact not henna but paraphenylenediamine. These tattoos can be found in Bali and other holiday destinations. Once sensitised, people allergic to paraphenylenediamine will react not only to hair dyes but to eyelash and eyebrow tints and may even develop cross-reactions to clothing dyes.

Epoxy resins used in the surface coating industry and in glues are a frequent cause of ACD. They may cause quite severe reactions, often in an airborne-contact distribution.

Cocamide diethanolamine is an emulsifying agent found in skincare products, particularly in some antiseptic skin cleansers used in hospitals.

Nickel and cobalt cause sensitisation particularly in women (approximately 18% compared with 5% in men) through exposure to cheap jewellery, watch bands, jeans studs and buckles. Occupational nickel dermatitis is not common but may occur in cashiers, electroplaters and people handling metal objects, such as keys and pins. Some experts believe nickel allergy to be a bad prognostic factor for endogenous hand eczema.

Substances applied to the skin may cause ACD including:

- Preservatives, especially formaldehyde releasers including quaternium 15 in water-based products (creams, gels, lotions, shampoos).
- Preservatives, particularly methyl-chloroisothiazolinone and methyl-isothiazolinone in wet wipes and various rinse-off products. We have recently observed an increasing number of allergic reactions to baby wipes, resulting in hand dermatitis in carers.
- Fragrances in deodorants (not the aluminium, which is often suspected).
- Lanolin.
- Medicaments, especially neomycin.
- Tea-tree oil, which is increasingly added to skincare products and should never be used on the skin undiluted.
- Antiseptics in hand cleansers.
- Rarely, topical steroids.
- Wood dusts may cause ACD, especially pine, which contains colophonium or resin. Colophonium is also present in adhesive tapes and some sticking plasters and other sticky substances such as violin rosin and depilatory waxes. Beauticians may develop ACD to their waxes.

Acrylates may cause ACD, especially from use in dentistry and in artificial nail preparations used by nail technicians.

Plants that may cause ACD (otherwise known as phyto dermatitis) in farmers and outdoor workers include agents such as capeweed and dogwood. Other plant allergens include alstroemeria in florists and rubus and grevillea in the general community.

Not uncommonly, positive patch test reactions are found that relate either to past exposure to allergens or no known exposure for that patient and have no relevance to the presenting problem. Nickel and cobalt are most often found in this regard. Before an allergen can be disregarded, however, a thorough history must be taken.

**Clinical presentation**

OCCUPATIONAL contact dermatitis predominantly affects the hands. It may present with pruritus, redness, vesicles (figure 2), scaling, fissuring or secondary excoriation. The pattern of dermatitis may give clues as to the initial site of contact with an allergen. However it is clinically often difficult to distinguish between ICD and ACD. In ACD, spread beyond the initial site may occur either as a result of transfer of the allergen or as an “id” or autoeczematisation eruption. This may be helpful clinically to differentiate ACD from ICD as spread beyond the site of contact is not usual in ICD.

**Assessment and diagnosis**

The diagnosis of occupational contact dermatitis is typically made from a combination of a thorough history, clinical examination and patch testing (if indicated). Sometimes there may be multiple contributing factors and the weighting of endogenous and exogenous factors is often complex (table 1, see page 30). There is also the possibility of a differential diagnosis (see page 30).

**Investigations**

**RAST and skin prick tests**

RAST is a blood test used in the investigation of immediate hyper-sensitivity reactions. Skin prick tests are often more specific and are most commonly performed by allergists in the investigation of asthma, hay fever and food allergens. Prick testing involves placing small quantities of the substance on the inner forearm and prick- ing through the substance into the skin. The area is then observed for 15-30 minutes for the presence of a wheal and the surrounding flare. Measurements are made and the size compared to a positive (histamine) control and a saline control (negative) and an assessment made as to the size of the reaction and its relevance.

Figure 2: Allergic contact dermatitis presenting with vesicles.
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from page 28

The most common work-related causes of contact urticaria are natural rubber latex and protein-containing foods. The safest diagnostic test for latex allergy is a RAST as there are reports of anaphylactic reactions when prick-testing for latex allergy.

Foods may also be prick-tested and this is especially important when investigating dermatitis in chefs. In this situation, prick-testing is performed by dermatologists investigating dermatitis, rather than by allergists.

Patch tests

Allergic contact dermatitis is investigated by patch testing, which is traditionally performed by dermatologists. There are two main testing procedures: use of pre-prepared tests (True Test) or individually prepared patch tests. The advantage of True Tests is that they are easy to use, however as only a maximum of 29 allergens are tested, many important allergens may be omitted.

At our clinic, we currently test to the ‘Australian Baseline Series’ consisting of 60 allergens that we have assessed to be the most important in our population. Patients are additionally tested to other series relevant to their exposures, such as rubber, chemicals, hairdressing allergens, and products specific to nursing. Samples of substances, appropriately diluted according to international standards, are placed on small discs which are mounted on strips of hypoallergenic tape (figure 3). The patches are then placed on the patient’s back for approximately 48 hours (during which time they must not get wet). Often more than 80 tests will be applied. Known skin irritants must not be tested as they may burn and scar the skin.

The initial patch-test reading is performed 48 hours after application, and the tests are interpreted about 15 minutes after removal of the tapes. The second reading is performed after a further 48-72 hours. This helps to distinguish irritant reactions (which fade) from true allergic reactions. A positive reaction appears as a raised red, often itchy spot, usually about the size of a five-cent piece. Patch-testing results are then graded as negative/weak/+ (nonvesicular, erythema, possible papules); strong/+ (edematous or vesicular); or extreme/+++ (spreading bullous or ulcerative).

Reactions must then be assessed as to their relevance to the patient’s presenting dermatitis. Generally only about 50% of reactions are relevant to the patient’s presenting dermatitis. Patch testing is an essential investigation in those with persistent dermatitis. It is important to note that patch testing only tests for contact allergy. As this test is a biopsy, it is not 100% accurate. Sensitivity and specificity are usually quoted to be in the vicinity of 70%. There is no routine clinical test for ICD and this is typically a default diagnosis made by the history of exposure to known irritants and the exclusion of allergy on appropriate patch testing.

In our specialised clinic, further enquiries are usually needed to determine if a patient’s allergic reaction is relevant to substances they contact in the workplace. Mathias suggested seven criteria for assessing occupational relevance when assessing a skin rash as listed in the box, above right. Answering “yes” to four or more questions suggests probable workplace exposure. Each workplace is required to have copies of Material Safety Data Sheets (MSDS), which give information about substances found in the workplace. It is mandatory for the information in these documents to be available to medical practitioners on request.

However, data sheets are not always accurate and not all ingredients are required to be listed. Substances that are in low concentrations need not be listed unless they are classified as hazardous. Not all important allergens are currently classified as such. An allergic reaction may occur despite presence of the allergen in a low concentration. Often time-consuming enquiries are necessary to obtain the relevant information.

Table 1: Summary of generalisations in contact dermatitis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Irritant contact dermatitis</th>
<th>Allergic contact dermatitis</th>
<th>Contact urtica</th>
<th>Mathias’ criteria used for determining the work-relatedness of occupational contact dermatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>People at risk</td>
<td>Atopics</td>
<td>Genetically predisposed but not necessarily atopics</td>
<td>Genetically predisposed including atopics</td>
<td>• Is the clinical appearance consistent with contact dermatitis?</td>
</tr>
<tr>
<td>Mechanism</td>
<td>Multifactorial: disruption of the epidermal barrier</td>
<td>Type IV (T-cell mediated) delayed hypersensitivity reaction</td>
<td>Type 1 (IgE-mediated) hypersensitivity reaction</td>
<td>• Are there workplace exposures to potential cutaneous irritants or allergens?</td>
</tr>
<tr>
<td>Mode of onset</td>
<td>Rapid with strong irritants (minutes to hours); gradual with weak irritants (most common) as epidermal barrier becomes compromised</td>
<td>12-72 hours (once sensitised)</td>
<td>Immediate: minutes</td>
<td>• Is the anatomical distribution of dermatitis consistent with cutaneous exposure in relation to the job task?</td>
</tr>
<tr>
<td>Distribution</td>
<td>Localised</td>
<td>Localised or can spread</td>
<td>Localised or generalised</td>
<td>• Is the temporal relationship between exposure and onset consistent with contact dermatitis?</td>
</tr>
<tr>
<td>Morphology</td>
<td>Erythema scaling fissures. Possible vesicles. Difficult to differentiate clinically</td>
<td></td>
<td>Erythema and swelling; ‘wheat and flare’ reaction. Intensely pruritic. May evolve into protein contact dermatitis</td>
<td>• Are non-occupational exposures excluded as probable causes?</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>History and examination Exclusion of ACD</td>
<td>Patch testing RAST Prick-testing</td>
<td></td>
<td>• Does dermatitis improve away from work and away from exposure to the suspected irritant or allergen?</td>
</tr>
<tr>
<td>Differential diagnosis of a rash on the hands</td>
<td>• Contact dermatitis: irritant, allergic</td>
<td>• Contact urtica, which may evolve into protein contact dermatitis</td>
<td>• Endogenous eczema, including – atopics eczema – hand eczema, previously termed pompholyx or dyshidrotic eczema – discoid eczema – in people with a history of psoriasis, eczema or contact dermatitis, it may appear as hyperkeratotic-like psoriasis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dyshidrotic eczema</td>
<td>• Psoriasis, particularly occurring at sites of friction</td>
<td>• Tinea (fungal infection) particularly if unilateral on a hand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Id or autoeczematisation reactions (especially associated with inflammatory tinea pedis)</td>
<td>• Photosensitivity eruptions, often caused by drugs and porphyria cutanea tarda</td>
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<td></td>
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<tr>
<td></td>
<td>• Photosensitivity eruptions, often caused by drugs and porphyria cutanea tarda</td>
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<td></td>
</tr>
</tbody>
</table>

Reference

Prevention and treatment

PREVENTION and treatment of occupational contact dermatitis is similar for both ICD and ACD. Identification, awareness and avoidance of known irritants and allergens are of prime importance. If people at increased risk of developing occupational contact dermatitis are made aware of the existence of that risk they can take appropriate precautions. In particular, people with a history of skin atopy who are planning to enter a high-risk career, such as hairdressing, need to be informed of their increased risk and be given advice about an appropriate skin care regimen.

Avoidance

Avoidance of skin irritants or reduction in the exposure both in terms of time and amount will be beneficial. Substitution of known harmful or hazardous substances with a less harmful chemical should be undertaken where possible.

Gloves

Wearing appropriate gloves is important. Using different gloves provides protection against different hazards. Some allergens penetrate the skin through gloves and not all gloves will provide adequate protection. Information is available from glove manufacturers to enable the correct glove for the job to be chosen. Avoiding both the unnecessary use of disposable latex gloves and, in particular, the use of powdered latex gloves is important to reduce the likelihood of latex allergy. Nitrile gloves are a suitable alternative to latex gloves particularly in those who have risk factors for latex allergy. Nurses are often unaware that wearing vinyl gloves does not give protection from biological hazards. However vinyl gloves are appropriate for food handlers who need to wear latex gloves as residues of latex glove protein may have been reported in latex-sensitive customers. Wearing cotton liners within gloves is suggested to reduce sweating and help to preserve skin barrier function.

Skin care

Skin care in the workplace may include the use of waterless hand cleansers such as alcohol rubs. These are not suitable for healthcare workers with visibly soiled hands but are quite appropriate for handwashing when there is no visible soiling. They can sting if people have pre-existing dermatitis so the hands need to heal before they can be used.

Soap substitute

Where possible, use of a soap substitute is preferred, which is less irritating to the skin and provides some emollient effect. Soaps are often alkaline and some incorporate sand or pumice, both of which are very abrasive. Similarly, use of paper towels may also contribute to skin irritation caused by friction. Use of barrier creams is debated because of the lack of existing evidence of their value and concern that their promotion may lead to complacency in workers and neglect of other appropriate preventive behaviours. Nevertheless, their use may make workplace skin irritants easier to wash off.

Topical steroids

When topical steroid treatment is required, a steroid ointment is preferred. Ointments do not have preservatives that may cause allergic reactions in some people. They also spread more readily over the skin surface, facilitating better coverage and allow enhanced skin penetration/absorption. Secondary bacterial infection may complicate dermatitis. If recurrent flares of dermatitis occur, intermittent treatment three times a week with a topical steroid may maintain good skin condition and prevent the need for frequent longer treatment courses. Severe cases may require a tapering course of oral steroids for symptom relief. A lower dose of oral steroids over a longer time is often preferable to a higher dose over a shorter time. If the person cannot work without continuing to develop the rash, job modification or job change may be necessary. Contact dermatitis takes time to heal and, in moderate to severe cases, it may take several weeks. Time off work may be required, which may also help to determine the work-relatedness of a skin condition. Discussions with the employer are almost always required and worker’s compensation claims will need to be submitted. In severe cases therapy with UV light, Grenz ray radiation, oral retinoids (acitretin is available in Australia and alitretinoin has shown promise in Europe) and immunomodulatory agents such as azathioprine and methotrexate may need consideration. Such cases should be managed by a dermatologist.

Prognosis of occupational contact dermatitis

DUE to a lack of standardisation of cases, the prognosis of occupational contact dermatitis remains difficult to quantify. Factors affecting prognosis include a history of past episodes, the irritant encountered, the duration of the condition before diagnosis, interventions, patient occupation and whether a change in job or job role was made, as well as compliance with treatment and ongoing prevention strategies. Studies report a wide range of outcomes with improvement ranging from 18-84% across review times varying from one year to 13 years after the original diagnosis. Most patients report at least partial resolution. Some patients go on to develop persistent post-occupational dermatitis first described by Wall and Gebauer as “ongoing dermatitis for which there is no obvious precipitant or precipitated by prior occupa- tional contact dermatitis”. These patients tend to experience an initial resolution when removed from exposure to causative agents but go on to lose this capacity and develop a persisting dermatitis, which may be intermittent or constant. Persistent post-occupational dermatitis appears to occur after both ICD and ACD and has significant occupational, financial and personal impacts. Studies reporting the effect of job change on the prognosis of the disease have conflicting findings. Because job change is not always associated with improved prognosis all attempts should be made to minimise current work exposures and maximise patient knowledge about causative factors before the decision is made to change work. Further research is required to define the extent of the problem of persistent post-occupational dermatitis and associated risk factors. It is of particular importance in the Australian context where workers with an accepted claim for workers’ compensation may be reassessed. If they are no longer working but still have persistent dermatitis their claim may be unfairly terminated.

Summary

• If patients present with contact dermatitis, implement treatment including a skincare regime. If it is severe, they have skin contact with known allergens or do not respond to initial treatment, refer to a dermatologist. Early recognition of the causative factors in occupational contact dermatitis improves the prognosis.
• Make sure your patients choose the right career for their skin. People with a past history of eczema are at increased risk of occupational contact der- matitis. They may not always have to avoid high-risk careers but at least should be forewarned.
• Avoid exposure to skin irritants. Frequent use of soaps and continual wetting and drying the skin are significant causes of skin irritation.
• Use of moisturising cream is important both for treatment and prevention of occupational contact dermatitis especially when applied to the hands at night.
• Greasy creams and ointments are more effective moisturisers than runny lotions from a pump pack. Topical steroid ointments are less allergenic than creams, which always contain preservatives.
• The most common allergens at the Occupational Dermatology Clinic in Melbourne are rubber chemicals related to the wearing of rubber gloves. Often these people have pre-existing skin damage. Use of lined rubber gloves is recommended, or better still, cotton gloves underneath protective gloves.
• People with dermatitis who wear rubber gloves of all types may need to be screened for allergy to natural rubber latex by a.RAST or skin prick test.
• Even when affected skin appears to have returned to normal it may be sensitive and easily irritated for some months. Contact dermatitis may take some time to recover.
• Long-term or recurrent use of oral steroids must be avoided at all costs.
• Even when affected skin appears to have returned to normal it may be sensitive and easily irritated for some months. Contact dermatitis may take some time to recover.
How To Treat – Occupational contact dermatitis

Authors’ case studies

Case 1 — nurse with irritant contact dermatitis

A 26-YEAR-old registered nurse working in a hospital presented with a one-month history of a red, scaly, itchy rash affecting the backs of her hands and wrists. Her rash cleared completely during a six-week break from work. Soon after returning to work it recurred, but again improved on her days off. She described itching after removal of disposable non-powdered latex gloves. She had a history of hay fever and an allergy to erythromycin. She was diagnosed with irritant contact dermatitis in an atopic individual significantly related to her work. She was given a short course of daily topical steroid ointment together with advice to decrease skin contact with irritants at home by using appropriate gloves, soap substitute and after-work moisturising cream. Her hands improved and she was able to discontinue use of the topical steroid but continued her skin-care program.

Case 2: Allergic contact dermatitis from epoxy resins

An 18-year-old man presented with dermatitis that occurred one month after starting work as an epoxy resin applicator in the surface coating industry. He initially had itchy red vesicles on his hands (figure 2, page 30), although later the rash spread to his forearms, face and eyelids. He suffered from mild hay fever and was known to be allergic to penicillin. He had not initially worn gloves but later tried to protect his hands with rubber gloves.

On patch testing to a total of 71 substances, he was found to be allergic to epoxy resin and an epoxy hardener dichlorodimethyltriamine. A diagnosis of allergic contact dermatitis to epoxy resins was made significantly related to his work. Epoxy resins penetrate many gloves and thick reusable nitrile or silver lame gloves are recommended. Unfortunately, as a result of his skin condition this young man was unable to continue to work in this area and needed to find an alternative occupation.

INSTRUCTIONS

Complete this quiz online and fill in the GP evaluation form to earn 2 CPD or PDP points. We no longer accept quizzes by post or fax.

The mark required to obtain points is 80%. Please note that some questions have more than one correct answer.

GO ONLINE TO COMPLETE THE QUIZ


INQUIRY

How to Treat Quiz

OCCUPATIONAL CONTACT DERMATITIS

26 April 2013

1. Which TWO statements are correct regarding occupational contact dermatitis?

a) Occupational contact dermatitis can be classified into allergic contact dermatitis (ACD) and irritant contact dermatitis (ICD) — in the latter prior sensitisation is not required
b) ‘‘Wet work’’ refers to the exposure of the skin to liquids for more than two hours a day, wearing gloves for more than two hours a day or frequent handwashing

c) Acute ICD typically develops suddenly when a tipping point is reached after significant, prolonged, repetitive exposure to wet work

d) Occupational contact dermatitis is a type of occupational skin disease, with other much less common types being infections, neoplasia and food intolerances

2. Which TWO statements are correct regarding allergic contact dermatitis?

a) Solvents used in home renovations are a common cause of ACD in Australia
b) It is important to determine whether the presenting complaint is ACD, because ruling out ICD will direct the investigation appropriately away from sensitising agents towards immediate contact irritants

c) It is important to determine whether the presenting complaint is ACD, because once established, the hypersensitivity is lifelong and may significantly affect the patient’s ability to continue working with the same materials or in the same industry

d) ACD can be easily distinguishable from contact urticaria by taking a thorough history

3. Which THREE statements are correct regarding the risk factors for occupational contact dermatitis?

a) Keeping gloves on from the start to the end of a shift is a good strategy to prevent accidental contact with irritant chemicals at work
b) Patients with asthma and hay fever have an increased risk of occupational contact dermatitis

c) Younger patients have a more youthful skin that protects them against occupational contact dermatitis while older patients are more at risk because of their age-related thin atrophic skin

d) Patients with eczema and other pre-existing skin diseases should be informed of their increased risk for occupational contact dermatitis

4. Which ONE of the following is NOT a common cause of occupational contact dermatitis?

a) Healthcare workers
b) Tradespersons and labourers
c) Automotive workers
d) IT engineers

5. Which ONE of the following is NOT a common cause of contact dermatitis?

a) Epoxy resin-based glues
b) Nickel bracelets
c) Chromates
d) Diluted tea-tree oil

6. Which THREE of the following should be considered in the differential diagnosis of a rash on the hands?

a) Psoriasis
b) Pyoderma rosea
c) Id reaction due to inflammatory tinea

d) Porphyria cutanea tarda

7. Which TWO statements are correct regarding RAST, skin prick testing and skin patch testing?

a) Skin prick testing involves comparing the different wheal and flare reactions caused by the tested substances, a histamine and a saline control after five minutes
b) Further inquiry is often necessary to determine whether a positive skin patch test result is the cause of the patient’s presenting dermatitis

c) Information on substances that the patient may have been exposed to in the workplace can always be found in the Material Safety Data Sheets (MSDS)
d) One of the most common work-related causes of contact urticaria is natural rubber latex. Prick testing for latex should be performed as a first-line investigation

8. Which TWO statements are correct regarding the prevention and treatment of occupational contact dermatitis?

a) The prevention and treatment of the different types of occupational contact dermatitis are similar despite their different aetiology
b) Alcohol rubs for healthcare workers are not recommended as a preventive strategy because of the drying effect of alcohol on the skin

c) Soaps are often alkaline and abrasive and should be substituted with moisturising cleansers that are less irritating to the skin

d) All gloves provide a barrier against potential irritant and allergic substances such as biological hazards

d) When topical steroid treatment is required, a greasier preparation should be used

9. Which TWO statements are correct regarding the use of topical preparations to prevent hand- and occupational contact dermatitis?

a) Moisturising in the web spaces of the hands should be stopped because this predisposes to fungal infections
b) A cream-based moisturiser is the preferred consistency for the prevention of occupational contact dermatitis because it can be readily absorbed into the skin and is less likely to cause sensitisation than greasier preparations

c) Topical steroids three times a week may treat recurrent flares of dermatitis and avoid the need for frequent prolonged treatments

d) When topical steroid treatment is required, an ointment preparation is preferred to a cream-based preparation

10. Which TWO statements are correct regarding the prognosis of occupational contact dermatitis?

a) Patients can expect full recovery from occupational contact dermatitis if compliance with medical recommendations is good
b) Patients with occupational contact dermatitis should be encouraged to change jobs because the evidence clearly shows a significant improvement in their prognosis

c) Some patients that have been treated for their occupational contact dermatitis and prevented from further exposure to the causative agents will nevertheless develop a persistent post-occupational dermatitis for which there is no obvious present cause
d) Persistent post-occupational dermatitis may occur after both ICD and ACD

CPD QUIZ UPDATE

The RACGP requires that a brief GP evaluation form be completed with every quiz to obtain category 2 CPD or PDP points for the 2011-13 triennium. You can complete this online along with the quiz at www.australiandoctor.com.au. Because this is a requirement, we are no longer able to accept the quiz by post or fax. However, we have included the quiz questions here for those who like to prepare the answers before completing the quiz online.

NEXT WEEK

Melanomas are a major cause of premature death from cancer. Early detection is associated with improved survival. The next How To Treat looks at the diagnosis and treatment of the different clinical subtypes of melanoma. The authors are Professor Rodney Sinclair, professor/director, Dr Niklos Polih, plastic surgeon, Dr Ken Khambay, medical oncologist, Dr Bruce Tate, dermatologist and Dr Shobha Joseph, dermatologist, all from Epworth Dermatology, Richmond, Victoria.

Evidence-based guidelines


See the pdf of this article at www.australiandoctor.com.au for a detailed table of evidence-based medicine for occupational contact dermatitis.
Evidence-based medicine for occupational contact dermititis

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Level of evidence and strength of recommendation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the high-risk groups for occupational contact dermititis?</td>
<td>People with atopic skin disease (particularly in adulthood) regardless of career choice People with personal or family history of atopy</td>
<td>IV-A [1-5]</td>
<td>[1, 2, 3]</td>
</tr>
<tr>
<td>Which careers are high risk? [Refer to box in text for most common occupations presenting with contact dermititis]</td>
<td>Occupations with more than two hours per day of wet work involved – eg, hairdressers Handwashing more than 20 times in a shift – eg, healthcare workers and cleaners Skin contact with irritants allergens or both – eg, hairdressers</td>
<td>IV-B [3, 6]</td>
<td>[3, 7-9]</td>
</tr>
<tr>
<td>Best skin protection advice</td>
<td>An integrated skincare package is required for skin disease prevention. Cotton gloves underneath occlusive gloves to decrease sweating Soap substitution After-work use of a greasy moisturising cream or ointment is best</td>
<td>I-A [1, 13-15]</td>
<td>[16, 17, 18, 20-22]</td>
</tr>
<tr>
<td>Other strategies for prevention of occupational contact dermititis</td>
<td>Avoidance or substitution of irritants/allergens if possible Waterless hand cleaner, eg alcohol rubs when appropriate Use of appropriate gloves (as per manufacturer’s health and safety recommendations and according to individual need) Regular application of emollients/moisturising creams Barrier creams are of questionable value</td>
<td>I-A [2, 14, 20-22]</td>
<td>[19, 20, 21]</td>
</tr>
<tr>
<td>Best GP management of hand dermititis?</td>
<td>See above skin protection advice Topical corticosteroid ointments Lower potency used for thinner skin (eg, eyelids, face, flexural surfaces, anogenital region) Long-term intermittent steroid ointment in chronic cases Combined antibiotics and topical steroids if infected If allergic contact dermititis involves extensive areas of the skin (greater than 20%), systemic steroid therapy is often required and offers relief within 12-24 hours Oral retinoids for chronic hand eczema Antihistamines are frequently prescribed but are generally ineffective for ACD</td>
<td>I-B [17, 20-22]</td>
<td>[21, 22, 23]</td>
</tr>
<tr>
<td>Which patients to refer for further management?</td>
<td>Patients whose dermititis does not clear with appropriate GP management are likely to present to another practitioner. They should be advised that it may take some time to see improvement, but to re-present if skin does not improve, and to be informed about the option of further referral and investigation Patients with persistent dermititis (suspected Type 1 or Type 4 contact hypersensitivity) not responding to corticosteroid ointment should be referred to a patch testing dermatologist for specialist review</td>
<td>III-B [17, 20-22]</td>
<td>[23, 24]</td>
</tr>
<tr>
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<td>III-A [17, 23]</td>
<td>[25, 26]</td>
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