

OCCUPATIONAL CONTACT DERMATITIS

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ABSTRACT

Occupational contact dermatitis is one of the most common work-related illnesses in many developed countries, accounting for up to one third of all occupational diseases. A high prevalence has been documented in specific occupational groups, such as construction workers, nurses, hairdressers, food processing workers and metal workers. Irritant contact dermatitis and allergic contact dermatitis are known as the two type of occupational contact dermatitis. Reddening of skin, blister, itchiness are symptoms of these dermatitis. Knowledge of the factors which predispose to occupational contact dermatitis is useful in occupational health practice for the application of preventive measures and for career guidance for workers in high risk occupations. Thus to maintain an effective work flow and good health status of the workers both the company and the workers should consider manipulating the risk factors and try to decrease or prevent the occupational contact dermatitis from getting worst.

Keyword: *Occupational contact dermatitis, Allergy contact dermatitis, Irritant contact dermatitis*

INTRODUCTION

Dermatitis is an inflammatory condition of the skin. It can vary in severity. Dermatitis is not infectious, so it cannot be passed from one person to another. Typical signs and symptoms of dermatitis are: dryness, itching, redness, swelling, blistering, cracking, flaking and bleeding. In severe cases nails can be affected. Where the eyes are involved, signs are runny eyes and redness. In severe cases eye lids may be swollen and closed. Occupational dermatitis is caused or made worse by work.¹

DEFINITION

Occupational dermatitis is a non-infectious disease caused by skin contact with substances used at work. Depending on the types of substances present, dermatitis may take two forms: a) allergic contact dermatitis or b) irritant contact dermatitis.² Irritant contact dermatitis occurs when the skin is exposed to a mild irritant (such as detergent or

solvents) repeatedly over a long period of time or to a strong irritant (such as acids, alkalis, solvents, strong soaps, or cleansing compounds) that can cause immediate skin damage. Only the section of skin in contact with the substance will be affected.³

Allergic contact dermatitis results when a person becomes sensitized to a substance (allergen). The person then develops an allergy to the substance and will react whenever in contact with that substance, no matter how minute the exposure. Reaction may range from minor to serious effects. Sensitization may occur within days of exposure, but usually takes months or years.^{2,3}

EPIDEMIOLOGY

In a self-reported work-related illness survey carried out in 2006/2007, it was found that 29,000 people believed they had a work-related skin problem. In the U.S. in 2004 there were an estimated 72 million people with contact dermatitis, with an estimated overall prevalence rate of 24,400 per 100,000 people per year. A 2005 U.S. survey showed that occupational skin disease had an incidence of 4.4 cases per 10,000 full time workers. Incidence rates of occupational contact dermatitis in other countries range from 1.3 to 19 cases per 10,000. Allergic contact dermatitis (ACD) accounts for more cases of occupational contact dermatitis than irritant contact dermatitis (ICD).⁴

ETIOLOGY

Irritant contact dermatitis makes your skin red and sore from direct contact with toxic substances in your workplace. How severe your reaction is depends on a) personal factors such as a history of allergy or contact dermatitis, or cuts, rashes and skin injuries; b) what part of your body is exposed to the irritant; c) if your work setting makes it easy for the irritant to enter your skin through sweat from heat and humidity in the workplace, through low humidity that causes dry skin, through dampness causing the skin to chap, and through scrapes from friction in using some kinds of equipment.^{1,5,6}

Allergic contact dermatitis has to do with your body's immune system. The cells in your body react when a foreign substance enters it. A foreign substance can be a strong chemical that is absorbed into your skin. This can lead to an allergic response in your body, such as a rash. The rash comes out 24 to 96 hours after contact. How severe your

reaction is depends on: a) how long and how often you have contact with the substance; b) what skin problems, rashes, cuts, scratches or scrapes you have; c) whether the temperature and humidity in your workplace cause you to sweat or make your skin dry out or chap; d) other factors such as your age and family history of allergic dermatitis.^{5,6}

PATHOPHYSIOLOGY

Irritant contact dermatitis is a condition caused by direct injury of the skin. An irritant is any agent capable of producing cell damage in any individual if applied for sufficient time and in sufficient concentration. Immunologic processes are not involved, and dermatitis occurs without prior sensitization. Irritants cause damage by breaking or removing the protective layers of the upper epidermis. They denature keratin, remove lipids, and alter the water-holding capacity of the skin. This leads to damage of the underlying living cells of the epidermis.^{6,7}

Allergic contact dermatitis is a type IV hypersensitivity reaction only affecting previously sensitized individuals. The 2 distinct phases in a type IV hypersensitivity reaction are the induction phase and the elicitation phase. During the induction phase, an allergen, or hapten, penetrates the epidermis, where it is picked up and processed by an antigen-presenting cell. The processed antigen is presented to T lymphocytes. The elicitation phase occurs when the sensitized individual again is exposed to the antigen. The antigen penetrates the epidermis and is picked up and processed by an antigen-presenting cell. The processed antigen is presented to the circulating effector T lymphocytes that, in turn, produce lymphokines. These lymphokines mediate the inflammatory response that is characteristic of an allergic contact dermatitis.^{6,8}

CLINICAL SYMPTOMS

People will differ in their reactions to exposure. Some people may react severely to a substance while others may not react at all.⁶

Tabel 1. Clinical Symptoms of Allergic and Irritant Contact Dermatitis⁶

Allergic Contact Dermatitis	Irritant Contact Dermatitis
Reddening of skin	Mild swelling of skin
Dry, scaly patches	Stiff, tight feeling in skin
Blisters that ooze	Dry cracking skin
Burning or itching	Blisters
Swelling in eyes	Localized reactions (area where contact was made)
Hives	
Darkened/cracked skin	
Reactions can spread beyond the area where contact was made	

DIAGNOSIS

Diagnosis of irritant contact dermatitis is primarily based on a history of exposure to a known potential irritant that is consistent with the observed clinical appearance and anatomic distribution. The rash usually heals once the irritant is removed and, if necessary, special treatment is applied. Irritant dermatitis in any case is usually the result of the cumulative effect of multiple irritants.⁷

It is easy to recognize allergy contact dermatitis and no specific tests are necessary. The rash usually (but not always) completely clears up if the allergen is no longer in contact with the skin, but recurs even with slight contact with it again. Patch tests are used to confirm allergic contact dermatitis and identify the allergens. They do not exclude irritant contact dermatitis as the two may coexist.⁸

TREATMENT

Irritant contact dermatitis is treated with steroids, emollients, antibiotics, etc. as indicated by the clinical picture. If severe, may need to remove the worker from work (or to alternative work) until the dermatitis is largely resolved. Reduce the exposure to irritants. Topical steroids are used to reduce inflammation. Topical steroids should be applied not more than twice a day. Emollients cream is a topical agent such as petrolatum (Vaseline) provide an occlusive film over inflamed skin, decrease fissuring, and reduce

evaporation. Emollients are most effective when they are applied after skin has been soaked or washed in water.^{7,8}

To treat allergy contact dermatitis first we must find out precisely what you are allergic to by having comprehensive patch test.⁹ Identify where the allergen is found. Carefully study your environment to locate the allergen. Local treatment such as topical steroid that potent (class II and even class I) steroid are used for several days at the beginning of the treatment. They are gradually replaced by weaker steroid (class III and IV) and are never discontinued abruptly (risk of a rebound phenomenon). Besides, systemic treatment is also used to treat patient with ACD. Classical antihistamines (H1-receptor antagonists) are used mainly for their antipruritic and soporific effect and their clinical usefulness is limited except for sedation. Systemic corticosteroids maybe indicated for short period of time if ACD is widespread and severe.^{8,10}

PREVENTION

Workers should read and understand the nature of the material used to be informed of any health hazards and know the precautions to take will be a good start. Phrases such as “may cause skin sensitization” or “skin irritant” indicate that the substance can cause dermatitis. Check whether there is a safer alternative, if using a chemical that can cause dermatitis. A good example is water-based paints, cleaner or inks instead of solvent-based products. Use barrier creams and personal protective clothing such as gloves, aprons and chemical suits as a last resort to prevent skin contact and / or absorption.¹⁰ Ensure that the correct cream is used for protection, as there are different barrier creams for water soluble agents and for solvent-based agents. Remove any contaminated clothing quickly. Immediately wash skin that has been in contact with skin irritants or sensitizers with large amounts of warm clean water and a mild moisturizing soap. Never wash hands with solvents such as Varsol or gasoline. Instead, use mild soaps and ensure that skin is frequently moisturized with hand creams. Seek medical attention as soon as possible, if any changes in skin are noticed while at work or after using substances.^{1,2,10}

Employers should change the way processes are done if possible to effectively reduce skin contact with dermatitis agents. For example, automated mixing instead of hand mixing substantially reduces the chance of skin contact. Provide appropriate barrier creams

or personal protective equipment as a last resort. In the case of an emergency have an eyewash station and deluge shower for cleansing the eyes, face and skin after contact with skin irritants or sensitizers. Provide adequate hygiene facilities on site for workers to wash hands and face at the end of the job, before eating, drinking or smoking and after using the toilet. Ensure that personal protective equipment or clothing is made of a material appropriate for the chemical being handled. Early diagnosis and advice is essential in preventing occupational dermatitis.^{3,10}

SUMMARY

Occupational contact dermatitis occurs whenever there is skin contact with substances used at work. Wearing protective devices while working such as face mask, working goggle, long sleeve shirts, proper gloves, safety helmet and safety boots while working can prevent possible direct contact of the foreign material to the skin. Workers should have a regular checkup with the doctors to treat any symptoms it in an early stage and avoid it from getting worst. Doctors should educate the workers on the safety measures and hygienic working style. Employers should as well play a role by rotating the working shift, so that the amount of exposure to the same workers can be decreased and have a chance to recover from the irritants/allergens before come in contact again. Prevention early and proper treatment will be the key in decreasing occupational contact dermatitis.

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