

Occupational Skin Diseases

By

Dr. Ashraf Hussain

Msc, PhD. Com. Med.

Introduction

The second cause of occupational diseases (15-25% of all occupational diseases)

A skin disease that is caused by physical, biological or chemical factor in work

Also a worsening of pre-existing skin disease can be termed as occupational skin disease (Psoriasis , Acne)

Causes of OSD include

Chemical agents

are the main cause of occupational skin diseases and disorders.

These agents are divided into two types: primary irritants and sensitizers.

Primary or direct irritants act directly on the skin through chemical reactions.

Sensitizers may not cause immediate skin reactions, but repeated exposure can result in allergic reactions.

A worker's skin may be exposed to hazardous chemicals through:

1. direct contact with contaminated surfaces.
2. deposition of aerosols.
3. immersion, or
4. splashes.

Contact Dermatitis

Occupational dermatitis is an inflammation of the skin causing itching, pain, redness, swelling and small blisters.

Contact dermatitis is an eczematous eruption caused by external agents, which can be broadly divided into:

Irritant substances that have a direct toxic effect on the skin (irritant contact dermatitis, ICD)

Allergic chemicals where immune delayed hypersensitivity reactions occur (allergic contact dermatitis, ACD).

The symptoms and presentation of ICD and ACD are so similar, it is extremely difficult to distinguish between them without clinical testing (e.g. patch testing).

Irritant contact dermatitis (ICD)

is a non-immunologic reaction that manifests as an inflammation of the skin caused by direct damage to the skin following exposure to a hazardous agent.

ICD represents approximately 80% of all cases of occupational contact dermatitis.

The reaction is typically localized to the site of contact.

ICD may be caused by

- ü phototoxic responses (e.g., tar),
- ü acute exposures to highly irritating substances (e.g., acids, bases, oxidizing/reducing agents),
- ü or chronic cumulative exposures to mild irritants (e.g., water, detergents, weak cleaning agents).

Allergic contact dermatitis (ACD)

- Caused by an immunologic reaction triggered by dermal contact to a skin allergen sensitizing agents producing a response after a single or multiple exposure and only in some individuals
- The reaction is not confined to the site of contact and may result in systemic responses.
- Systemic responses (difficulty breathing, inflammation of airways, pulmonary edema)

ACD may be caused by industrial compounds (i.e. metals, epoxy and acrylic resins, rubber additives, chemical intermediates), agrochemicals (i.e. pesticides and fertilizers), and commercial chemicals.

The severity of contact dermatitis is highly variable and depends on many factors including:

1. Characteristics of the hazardous agent (irritant and/or allergen)
2. Concentration of the hazardous agent (irritant and/or allergen)
3. Duration and frequency of exposure to the hazardous agent (irritant and/or allergen)
4. Environmental factors (e.g., temperature, humidity)
5. Condition of the skin (e.g., healthy vs. damaged skin, dry vs. wet)

Contact urticaria (CU)

In immunologic CU the reaction is an immunoglobulin E mediated early immune response against the sensitizing chemical substance.

Symptoms are itching and hives (urticaria) at the place of contact usually within an hour.

This can be accompanied by (allergic) rhinitis, conjunctivitis, asthma and rarely anaphylaxis

A well-known form of allergic CU is latex-allergy among healthcare and cleaning workers who are wearing latex gloves.

Tackling CU is more difficult, because it requires a total elimination of the allergen due to the risk of the more serious complications; thus change of job is more frequently recommended to avoid/ prevent exposure

Contact photodermatitis

Some chemicals may cause CD only in the presence of light

Sunlight or artificial light sources that emit specific wavelengths

2 categories:

- phototoxic
- photoallergic

Phototoxic Reactions

Involves a chemical along with UV radiation

Localized areas of tenderness at exposed location

Example: roofer is more easily sunburned on skin that has been exposed to tar fumes.

Photoallergic Reaction

Involves a chemical along with UV radiation

Involves the immune system

Only affects some individuals

Example: squeezing a lime while working in the sun

Occupational Skin Cancers

The second m/c form of occupational skin diseases

About 17% of all cases of occupational skin diseases

Risky exposures include:

- ✓ Ultraviolet light
- ✓ Ionizing radiation
- ✓ Poly cyclic aromatic hydrocarbons
- ✓ Arsenic

Other occupational skin ailments:

Occupational acne

These are comedos (pinheads), papules and pustules caused mostly by industrial oils and greases .

Caused by exposure to industrial chemicals.

Unlike common acne, these eruptions manifest at the site of skin contact.

Suspected in : a. Unusual sites of involvement e.g. forearms. b. Unusual age e.g. middle age males.

Car mechanics, maintenance workers are most at risk.

Tar derivatives and halogen-containing compounds (polychlorinated naphthalenes), iodides and bromides) may cause acne, just like certain pharmaceuticals.

Hyper pigmentation

Darkening of the skin from chronic physical irritation (e.g., itching)

Some chemicals may stimulate the production of melanin (thus darkening)

Tars, arsenic compounds, plant sensitizers.

Skin diseases of physical origin

Physical exposures range from direct stimuli and thermal conditions to radiation.

Mechanical trauma

Recurring rubbing or increased pressure can thicken the inflamed skin with “crazy-paving pattern” (lichenification) and callosity.

Called occupational stigmas are frequent at body parts exposed: shoulders of sack carriers, fingertips of guitarist.

Temperature

Heat

- ü Sweat stagnation can cause miliaria .
- ü Overlapping skin surfaces can become sodden, ending up in intertrigo.

Cold temperature

- ü Reynaud-like symptoms (blanching attacks of fingers)
- ü frostbites.

Skin Diseases of Biological Origin

Bacterial infections

Occupational pyodermas (folliculitis, furuncle, carbuncle, impetigo, ecthyma, paronychia, etc.)

Skin tuberculosis

Fungal infections (mycoses)

Yeast infections

Candida albicans,
onychomycosis (nail),
paronychia (around the nail bed),
interdigital mycosis (between the fingers or toes).

Viral skin diseases

Milker's nodules

Parasitic skin lesions

Arthropod bites from animal parasites

Bee and wasp

Scabies is caused by *Sarcoptes scabiei*.

Prevention of Occupational Skin Damage

1. Elimination
2. Substitution
3. Engineering Controls
 - a) process re-design to eliminate or reduce contact, automation, closed systems
 - b) Make plans for spills and leaks
4. Administrative Controls
 - a. Training, personal hygiene (remember lead and ingestion), barrier creams, rotation
 - b. Requires all workplaces contain a basin for washing, hot and cold running water, soap, clean towels or hot air dryers
5. PPE: gloves, aprons, boots, full body suits, face shields, goggles,
Provide a barrier; meet specifications for degradation and permeation