

"OCCUPATIONAL DERMATITIS"

by

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Occupational dermatitis plays a major role in the industrial health and is responsible for large number of man hours lost thereby. The defence mechanism of skin against external irritants consists of Cornified cells of the outer most layer of skin. This layer insoluble in water and alcohol and can withstand action of fairly strong acids, but it is easily attacked by alkalies and sulphides. The more vulnerable parts of the skin are the opening of the various ducts and hair follicles through which certain fat soluble compounds may easily enter.

"Cutaneous allergy" is defined as an "altered reactivity caused by a first contact with a substance and manifested after an interval of time upon second contact with the same or an identical substance."

The materials that workers handle can be classified into two types ;
(1) Primary cutaneous irritants (2) Cutaneous sensitizers.

Primary Irritant: It is an agent which will cause dermatitis by direct action on the normal skin at the site of contact if it is permitted to act in sufficient intensity or quantity for a sufficient length of time. A primary irritant actually denature the skin.

Sensitizer : It is an agent which does not necessarily cause demonstrable cutaneous changes on the first contact but may affect such specific changes in the skin that after few days further contact on the same or other part of the body will cause dermatitis.

A primary irritant may also act as a sensitizer. Exposure to it may so condition the skin, which otherwise if come in contact may not have caused any trouble now results into dermatitis e.g. wool dyer handling potassium dichromate. In strength 0.1 to 0.5% it acts as a sensitizer, while in higher concentration it is a definite primary irritant.

CAUSES OF OCCUPATIONAL DERMATITIS :

- 1) Mechanical - Friction, pressure, trauma e.g. callosities.
- 2) Physical - Heat, cold, sunlight, X-rays, e.g. Vasodilatation
- 3) Chemical - Inorganic and organic e.g. acids, alkalies, salts or metals, petroleum products, organic solvents, dyes etc.
- 4) Plant poisons - Certain woods.
- 5) Biological - Bacteria, fungi, parasites, Viri.

Mode of action :

1. Keratin Solvents - They dissolve the Keratin e.g. Alkalines, soaps etc.
2. Fat Solvents - They remove essential oil of the skin e.e. Terpentine, petroleum products.
3. Dessicators - They take water out of the skin e.g. sulphuric acid, calcium chloride.
4. Protein Precipitants - They denature the skin by causing albuminates. e.g. heavy metal salts.
5. Oxidizers - They have strong affinity for 'H' of skin and combine with free hydrogen e.g. Chlorine gas, chromic acid etc.
6. Keratogenic Agents - They act as stimulants to Keratin forming cells of the and cause acne like lesions and sometimes new growing e.g. petroleum and coal tar.
7. Photosensitizers - They act by their virtue of photosensitizing effect on the skin. Stimulation of melamin forming cells occur in the workers whose skin is exposed to coal tar, petroleum and certain parent dye substance like Benzanthrone.
8. Proliferative Agents - They stimulate the skin which may result in formation of benign new growths like Keratoderma, Papillomata, and malignant new growths like Epitherlioma e.g. Petroleum products, grease, tar, etc.
9. Dyschromia inducing agents - They produce leucoderma like lesions by their action on pigment cell layers, inhibiting its activity e.g. Mettol.

To detect the allergen, samples of materials which workers handle in their day to day work are collected and a patch test is performed on the worker with the suspected allergen. The suspected material after suitable dilution is applied on the skin, preferably on the back and a gauze piece is put over it and it is sealed with adhesive plaster. Normal saline or other inert liquid is used as a control. The reaction is read after 48 to 72 hours. The positive reaction consists of one of the following :-

Erythema - Urticarial Wheal. Vesiculation, blisteration, ulceration. The reactions vary from mild degree of Erythema to severe degree of ulceration. For the sake of detecting the allergen, we had classified the various industries under the following heads :

1. Textile - The workers were classified as oilers, working in carding dept., weavers, dye makers, printers, drawers, spinners, packers etc.

2. Chemical - working in oil, working with dye, working with paint, etc.
3. Engineering - working with acids and alkalines working with grease solvents etc.
4. Printing - various inks blocks etc.
5. Miscellaneous group.

Observation:

The industry most affected seemed to be Textiles, but this can be explained that we have more textiles mills around and number of textiles workers is more than the other industries. The next industry affected was Chemical and then Engineering.

Other interesting findings was the age of the worker and the years of service in the same department. It seems that younger group with less years of employment are more susceptible to skin hazards.

A mere involvement of skin of exposed parts is an industrial worker does not necessarily mean, that it is of occupational in origin, unless indicated by history, clinical examination and a positive patch test.

The following 4 points are useful in proving whether the skin conditions are of occupational in origin :

1. History : The case history should indicate that the skin affection was not present before the worker entered the particular occupation, but developed only during industrial exposure over a period.
2. Disappearance or reduction of the lesions if the affected person is away from the source for some time, e.g. person going on leave for some time.
3. Reappearance of lesion or exacerbation of lesions if the worker returns to work again.
4. Area involved will coincide with the parts affected that are coming in contact with the offending materials.

Preventive measures to be adopted :

1. Repeated clearing out frequent washing.
2. Mechanical protective measures e.g. protective clothings, use of gloves, gumboots etc.
3. Use of Barrier Creams.

BARRIER CREAMS :

Barrier Creams or protective ointments as they are sometimes called are meant to apply as a thin film on the skin which acts as a barrier against the offending agent.

- (1) Simple vanishing cream type: Containing zinc oxide which fills the pores of skin and prevents entry of irritants into the pore.
- (2) Water repellent type : Produces a thin film of water repellent substance (insoluble) which is useful for protection against acids, alkalies, paints, resins, cutting oils, coolant oils, kerosene, petrol, diesel oils and other chemicals.
It can be rinsed with cold water e.g. "Kerodex 71".
- (3) Water soluble type : For protection against irritant powders and dusts. But is readily soluble in water and is to be reapplied everytime the worker comes in contact with water e.g. Kerodex 50.
- (4) Silicon Creams : They form an extra layer of protective silicon on top of the horny layer of the skin and help in protection against various sensitizers e.g. siloderm cream. It is non-irritating and no sensitization has been reported so far.

The basic requirements of an ideal barrier cream:

1. It should be non-irritating and non-sensitizing.
2. It should offer adequate protection from irritants.
3. It should feel pleasant to the skin and mind no offensive smell etc.
4. It should be easily removable with soap and water and still not adherent to skin that it will not come off under actual working conditions.
5. It should be easily available to the worker.

It is said that anything and everything under the sun including the sun itself cause allergy seems to be true in cases of occupational dermatitis also.

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