Is it occupational dermatitis?

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Overview

• Common occupational skin diseases
• Evaluating a patient with possible occupational skin disease
• Managing occupational skin disease
  • Compensation
Occupational skin disease

IRRITANT
- Acute Irritant contact dermatitis

ALLERGIC
- Allergic contact dermatitis (Type IV)
- Protein contact dermatitis (?Type 1 & Type IV)
- Immunologic contact urticaria (Type 1)
- Immunologic contact urticaria (Type I)

OTHER
- Non-immunologic contact urticaria
- Pigmentation disorders
- Skin cancer
- Acne

Infections
Patch test for delayed hypersensitivity

Pathophysiology allergic contact dermatitis: Type IV hypersensitivity

Small haptens penetrate the skin. Initiate production of pro-inflammatory cytokines and chemokines

Hapten presented on Major Histocompatibility Complex to naïve T-cell

Re-exposure to same haptens results in activation of hapten-specific T cells in the skin

Inflammation leading to characteristic skin lesions

Source: Saito et al, 2016
Pathophysiology contact urticaria syndrome: Type I hypersensitivity

Allergen exposure leads to production of specific IgE

Subsequent exposures result in degranulation of mast cells with release of histamine, cytokines etc.
High risk occupations for OCD

<table>
<thead>
<tr>
<th>Occupational group</th>
<th>No. with OCD</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Other personal service workers” (includes hairdressers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal workers, including blacksmiths, toolmakers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubber and plastic products machine operators</td>
<td></td>
<td></td>
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<tr>
<td>Food processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painters and related trades</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housekeeping and restaurant services</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean risk of occupational dermatitis in the whole patient population was set as 1.00 in order to calculate the risk of occupational dermatitis in each occupational group. Occupational groups with a risk of occupational dermatitis of ≥ 1 and number of cases of ≥ 75 are shown.

* Includes hairdressers.
## Common allergens

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metals</td>
<td>Nickel, cobalt, chromates</td>
</tr>
<tr>
<td>Rubber additives</td>
<td>Thiuram mix, mercaptomix, IPPD, PPD, Mercaptobenzothiazole</td>
</tr>
<tr>
<td>Preservatives</td>
<td>Methylisothiazolinone and chloromethylisothiazolinone, formaldehyde and formaldehyde-releasers, parabens, Dibromodicyanobutane</td>
</tr>
<tr>
<td>Fragrances</td>
<td>Balsam of Peru (Myroxolon Pereirae), Fragrance Mixes</td>
</tr>
<tr>
<td>Plant allergens</td>
<td>Sesquiterpene lactone, Compositae</td>
</tr>
<tr>
<td>Resins</td>
<td>Epoxy resin, toluenesulphonamide formaldehyde resin</td>
</tr>
</tbody>
</table>
Evaluating a patient with occupational dermatitis
Step 1: Personal and occupational history

• Pre-existing skin or atopic conditions

• When did symptoms start? How does rash present? Associated Type 1 allergy symptoms?

• Does condition improve with time away from work, and worsen on return to work?

• Other exposures (hobbies, second job, household chores etc)
Occupational history

• Important to obtain detailed description of tasks

• Ascertain presence of chemical hazards, particularly known allergens

• Consider presence of irritants in the workplace:
  • Wet work
  • Occlusive gloves
  • Frequent handwashing
  • Detergents/soaps/solvents/acids/alkalis
  • Mechanical irritants (friction)
Step 2: Clinical examination

• General examination

• Skin examination
  • Can help to elucidate cause (pattern, morphology, symmetry)
  • Occupational dermatitis usually involves the hands, but may involve face & arms (airborne exposures) and feet (shoes)
  • Ensure that whole body is examined, including feet

• Other systems as necessary (respiratory in particular)
Step 4: Special investigations

• Biopsy
• Fungal scraping

• To exclude:
  • Psoriasis
  • Tinea manuum
Patch testing

• On the back
• Commercial allergens & work agents

• Contra-indications:
  • Active dermatitis on back
  • Immunosuppressive treatment
  • Recent tan/sunburn
  • (Pregnancy)
  • (Breastfeeding)
Patch test reading

- Left in situ 48 hours
- Read at 72 hours
- Relevance of positive reactions

Source: www.smartpractice.com
Prick prick testing & specific IgE

• Not for allergic contact dermatitis

• Performed rarely as protein contact dermatitis and contact urticaria are far less common than contact dermatitis

• Suggested by history of immediate reaction – itch, wheal & flare
Step 3: Workplace assessment

• Difficult to do risk assessment for skin exposure
  • No methods for measuring skin exposure directly
  • Incomplete data about safe exposure levels
  • Time consuming to do as wide range of chemicals and tasks, and toxicology may not be obvious
Skin exposure risk assessment

Define task → Identify chemicals → Identify hazards → Identify skin exposure → Exposure control measures

Safety Data Sheets
Online resources

Direct
Indirect

OBSERVE PROCESS
Case
Standard patch:

2+ IPPD
1+ chrome
1+ nickel

Relevance?
Management of occupational skin disease
Management of the patient

• Allergen avoidance

• Topical steroids

• Emollients

• Avoidance of causes of irritant contact dermatitis
Management of the workplace

Hierarchy of Controls

- Elimination: Physically remove the hazard
- Substitution: Replace the hazard
- Engineering Controls: Isolate people from the hazard
- Administrative Controls: Change the way people work
- PPE: Protect the worker with Personal Protective Equipment

www.cdc.gov
Management of compensation process

• Medical practitioner is legally obliged to report occupational disease to the Chief Inspector of the Department of Labour (Occupational Health and Safety Act, 1993)

• Compensation for Occupational Injuries and Diseases Act, 1993
  • Allowance for compensation for occupational irritant and allergic contact dermatitis, and occupational vitiligo
  • Pays medical expenses, temporary total disablement and permanent disablement
Circular Instruction 181

• Definition

• Requirements for Diagnosis
  • Diagnosis by medical practitioner or dermatologist where disease is recurrent or chronic
  • Photographs
  • Exposure history in the workplace
  • Confirmatory testing (patch tests)

• Assessment of impairment
  • Body part involved
  • Treatment required to control

• Required paperwork
# Impairment calculation

## Table 1: Affected Body Part

<table>
<thead>
<tr>
<th>Aspect of the body affected</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand (each)</td>
<td>10</td>
</tr>
<tr>
<td>Forearm (each)</td>
<td>3</td>
</tr>
<tr>
<td>Upper arm (each)</td>
<td>1</td>
</tr>
<tr>
<td>Face</td>
<td>10</td>
</tr>
<tr>
<td>Neck</td>
<td>1</td>
</tr>
<tr>
<td>Chest</td>
<td>3</td>
</tr>
<tr>
<td>Back</td>
<td>4</td>
</tr>
<tr>
<td>Foot (each)</td>
<td>10</td>
</tr>
<tr>
<td>Thigh (each)</td>
<td>2</td>
</tr>
<tr>
<td>Calf (each)</td>
<td>2</td>
</tr>
</tbody>
</table>

## Table 2: Chronic Medication Required

<table>
<thead>
<tr>
<th>Medication</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No treatment</td>
<td>0</td>
</tr>
<tr>
<td>Anti-pruritics and/or emollients</td>
<td>2</td>
</tr>
<tr>
<td>Topical steroids</td>
<td>5</td>
</tr>
<tr>
<td>Systemic steroids</td>
<td>10</td>
</tr>
</tbody>
</table>

## Table 3: Summary of Impairment Scores for Dermatitis

<table>
<thead>
<tr>
<th>Total Impairment Score</th>
<th>Permanent Disablement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>10 %</td>
</tr>
<tr>
<td>6 - 10</td>
<td>15 %</td>
</tr>
<tr>
<td>11 - 15</td>
<td>20 %</td>
</tr>
<tr>
<td>16 - 20</td>
<td>25 %</td>
</tr>
<tr>
<td>21 - 25</td>
<td>30 %</td>
</tr>
<tr>
<td>26 - 30</td>
<td>35 %</td>
</tr>
<tr>
<td>31 - and above</td>
<td>50 %</td>
</tr>
</tbody>
</table>
Take home messages

• Always consider occupation in contact dermatitis, particularly if hands are involved

• Relevance of patch test results needs to be determined by assessing workplace exposures

• Allergen avoidance and job modifications mainstay of treatment
Thank you
Useful websites

• www.labour.gov.za

• www.hse.gov.uk

• www.cdc.gov
References

