Occupational dermatoses

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Epidemiology

- Accounts for 40-50% of occupational illnesses
- 80-90% of all types of occupational skin diseases may be classified as Contact Dermatitis
- Approximately 80% of all cases of contact dermatitis are believed to result from skin irritation rather than contact allergy
skin diseases other than Contact Dermatitis

- Urticaria
- Acneiform eruptions
- Pigmentary disorders
- Skin infection
- Skin cancers
Establishing the diagnosis

- History:
  1. an accurate chronologic sequence of events
  2. description of skin lesion
  3. disability caused by skin disease
  4. all relevant work exposure
  5. similar skin disease in co workers
  6. response to previous medical treatment
Establishing the diagnosis (continue)

- Physical examination:
  - distribution
  - principal sites of involvement
  - other characteristic skin diseases

- Patch testing
Important causal agents of occupational skin disease by selected industry classifications

- **Electronic**: solvents, resins, acids, fiberglass, metals
- **Machinery**: cutting oils, solvents, resins, fiberglass
- **Chemical products**
- **Rubber & plastic products**: fiberglass, resins, solvents
- **Stone, clay, glass**: cement
- **Food product**: fruits, vegetables, meats
- **Detergents, soaps**: 
Important causal agents of occupational skin disease by selected industry classifications (continue)

- Agriculture: plant & animal products
- Construction
- Hospital /health services
- Restaurants
Factors predisposing to development of cutaneous irritation

- Potential irritant
  - chemical properties
  - physical properties
- Quantitative aspects of exposure
  - concentration
  - duration of exposure
  - frequency and number of exposures
- Qualitative aspects of exposure
  - occlusion of substance against skin
  - temperature of substance or skin surface
Factors predisposing to development of cutaneous irritation (continue)

- Preexisting skin damage to protective skin barrier
- Anatomic skin site

- **Host susceptibility**

  - **Atopic disease:** unlike ICD there do not appear to be any unique risk factors determining host susceptibility to ACD
  - Race
  - Sex
  - Age
Clinical aspects

- ICD generally remains confined
- 25% symptom free, 50% periodic flares, 25% persistent eczema
- 30-40% have changed their job but surprisingly only 25% experience complete clearing (OCD)
- Hairdressers had highest rate of job change
Common causes of ACD

- Metallic compounds:
  - Ni, Cr, Gold, Hg

- Rubber products:
  - Accelerators, Antioxidants

- Plastic resins:
  - Epoxy resins, Phenolic resins, Formaldehyde resins, Acrylic resins, Rosin (colophony)
Common causes of ACD

- Organic dyes
  - paraphenylenediamine (beauticians, textile industry, color developing agents, numerous others)

- Topical first aid medication
  - Neomycin, Benzocaine

*ACD requires complete elimination of exposure to the allergen*
Photo dermatitis

- Requires activation of a chemical substance on the skin surface by UV (290 – 400 nm) for its chemical expression.
- Generally contain Aromatic rings
- Two main reactions are phototoxic reaction and allergic photosensitization
- Phototoxic Dermatitis:
  - Tar smarts (railroad workers)
  - Furocoumarins (farmers)
- Photo Allergic Dermatitis:
  - halogenated salicylanilides (soaps)
  - chlorothiazids (drugs)
  - epoxi resins
Pigmentary disorders

Toxic vitiligo

- Depigmentation can be caused by inhibiting of melanin synthesis, killing the melanocytes.

- Phenolic or cathecolic derivatives:
  - rubber mfg, photographic developing agents, lubricating oils, plastic mfg, disinfectants
Pigmentary disorders

**Discolorations and stains**

- **Mechanism:** deposition, stimulation of melanin synthesis
  - chronic intoxication from heavy metals:
    - Ag, Hg, As
  - nitrosylated compounds:
    - TNT, dinitro phenol, …
Acneiform Disorders

**Environmental acne**

- Preexisting acne vulgaris may be aggravated by various occupational stress
  1. Tropical acne: acne prone individuals employed in tropical climates
  2. Acne mechanica: tight fitting work clothing, pressure from seat belt
Acneiform Disorders

Oil acne

- Lubricating petroleum greases, oils, and pitch fumes may cause **follicular plugging** and postular folliculitis and is seen not infrequently in machinists and automotive mechanics.

- Mechanism: stimulation of **follicular keratinization** followed by ductal occlusion
Acneiform Disorders

Chloracne

- Caused by polychlorinated or poly brominated aromatic hydrocarbons (halogen acne)
- Mechanism: induction of metaplasia, keratin filled cysts
- Noninflammatory comedones and cysts in malar crescents and posterior auricular folds
- Poly Chlorinated Biphenyl (PCB)
Vascular reactions

Urticaria

- It is rare
- Generalized form caused by inhalation so are accompanied by other symptoms of inhalant allergy (asthma, rhinitis, conjunctivitis).

Platinosis

- Contact urticaria: gardening, food handling, veterinary medicine
Vascular reactions
flushing

- Transient redness of skin
  - Rubber industry workers: thiuram disulfide
  - Degreasers flush: trichloroethylene
    If followed by alcoholic beverages ingestion
  - Rosacea: may be triggered
Collagen Vascular Disease

Scleroderma like disorders

- Cutaneous changes similar to those observed in scleroderma or progressive systemic sclerosis:
  - Venyl chloride
  - Silica
  - Epoxy resin
  - Perchloroethylene
  - Miscellaneous organic solvents
Neoplasms

Radiation

- UV: SCC, BCC, lentigo malignant melanoma
  - Host susceptibility and pigmentary skin differences
  - Outdoor workers (actinic origin), PAH & Nitrosourea, chemical irritants
- Ionizing radiation: SCC, BCC, malignant melanoma, Sarcoma
  - Aggressive and metastatic
Neoplasm

Poly Aromatic Hydrocarbons

- Dimethylbenzantheracene, Benzyprine
- After latent intervals of 6-20 years:
  - keratotic papillomas (tar warts) in face, forearms, hands, ankles, dorsal feet, scrotum
- Co factors: UV, trauma
Neoplasm

Arsenic

- Chronic exposure: (water, fowlers solution, inorganic arsenic)
  - punctuate, keratotic papules (arsenic kurtosis), on palms and soles
- No exposed skin surfaces, intraepidermal SCC (Bowens disease)
Infection & Infestation

bacterial

- Heat & humidity: staph
- Inoculation of Anthrax
- Handlers of raw meat or poultry products & fish: Erysipeloid, strep
- Mycobacterium
Infection & Infestation

**Viruses**

- Herpes simplex
- Orf (echthyma contagiosum)
- Milkers nodule (paravaccina virus)
Infection & Infestation

Fungi

- Dermatophytes may infect the fingernails and hands of those employed in wet work occupation: bakery, foundry, ...
- Sporotrichosis: contaminated vegetation
- Zoophilic fungi: animal handlers
- Candida infections (paronychia): warm & moist work environments
Infection & Infestation

parasites

- Outdoor workers:
  - Hookworms & schistosome
  - Scabies
  - Mites (poultry or grain mites)
Disorders of hair

- Diffuse hair loss (toxic alopecia):
  Thallium, Boric acid, Arsenic, Chloroprene
Common causes of Occupational nail disorders

- **Infection:**
  - Staph, Pseudomonas, Candida, Dermatophytes

- **Contact dermatitis:**

- **Dystrophic growth:**
  - trauma, radiation, vibration, chemical toxicity

- **Onycholysis:**
  - trauma, contact dermatitis, infection
Common causes of occupational nail disorders

- **Discoloration:**
  - **Infection:** Pseudomonas (green)
  - Dermatophytes (white, yellow, black/brown)
  - **Chemical Stains:** Nitrosylated com. (yellow)
    - Coal tar (brown/black)
    - Organic dyes (brown/black)
  - **Chemical Toxicity:** silver (blue)
    - PCB (brown)
    - Arsenic (white bands) Mees lines
    - Trauma (white bands) Beaus lines
Any question?