

Dermatomycosis

Dermatomycoses are inflammatory infectious diseases of the skin caused by:

- **dermatophytes** (head moth, body moth, hand moth, foot moth, nail moth) - **dermatophytoses**;
- **yeast** (candidosis of the oral mucosa, skin candidosis, vulvovaginitis candidosa, balanitis candidosa, paronychia candidosa) - **candidosis** ;
- **malassezia** (saprophytic cutaneous mycosis pityriasis versicolor - *Pityrosporum orbiculare/ovale*, syn. *Malassezia furfur*) - **keratomycoses**;^[1]

Dermatomycoses belong to the most common skin diseases, along with eczema diseases and Leg ulcerations. Some persistent diseases can signal serious ones impairment of general or local immunity (diabetes mellitus, disorders of the immune system, etc.).^[2]

According to the localization of the pathological process in the skin:

- **Keratomycoses** - affect only the horny layer epidermis;
- **dermatomycoses** - affect the skin (possibly mucous membranes), nails, or hair;
- **deep mycoses** - affect the subcutaneous tissue, often internal organs, can be systemic in nature.^[3]

Originators

The originators of dermatomycosis can be parasites of plant origin, according to botanical systematics they belong to fungi.^[3] Their cell wall is composed of chitin, lipids, polysaccharides and cellulose. They have a nucleus, they do not contain chlorophyll. To grow and reproduce, they require an organic substrate, oxygen, moisture, an alkaline environment, and an optimal temperature of around 36.7 °C. They have an affinity for keratin.

By morphology:

- filamentous fungi – producing long fibers (hyphae) that intertwine and form mycelium, reproduce by means of spores (conidia),
- yeast – unicellular organisms with budding cells (blastospores);
- some agents are dimorphic – they are able to grow in the form of fibrous mycelium as well as in the form of yeast, depending on the conditions;
- both types of spores (conidia and blastospores) tend to be very resistant to external influences.

According to pathogenesis:

- saprophytic – cause disease only in conditions suitable for them;
- pathogenic – they always cause disease;
 - only a small part is pathogenic for humans.

According to epidemiology:

- geophilic (vegetate in soil or on plants) – transfer from soil to humans;
- zoophilic (parasitic on the skin of animals) – transmission from animal to human;
- anthropophilic (they only grow on human skin) - transmission from person to person;^[4]

Clinical picture

The clinical picture depends on the causative agent and the localization of the disease process. Zoophilic species cause rather acute inflammatory lesions, while anthropophilic species (adapted to humans) cause inflammation of a chronic nature.^[3]

Risk factors for dermatomycoses:

- work in a hot environment associated with increased sweating;
- use of rubber shoes associated with skin maceration;
- using socks made of synthetic fibers that do not absorb sweat well;
- non-observance of basic hygiene habits – using foreign shoes, foreign towels.^[3]

Risk factors for the development of persistent clinical manifestations:

- disorders of carbohydrate metabolism (diabetes mellitus);
- disorders of cellular immunity (neoplastic diseases including hemoblastoses);
- long-term treatment cytostatics, corticosteroids, or antibiotics (in this case, candidiasis is used in particular).^[3]

Dermatophytosis



For more information see *Dermatophytosis*.

Tinea capitis

- causative agent: *Microsporum (M.) canis*
 - zoophilic dermatophyte
 - the most common reservoir is kittens
- typical for childhood
- during puberty, the human ringworm becomes insensitive to infection by the genus *Microsporum*, so adult contacts develop tinea corporis.^[1]

Tinea corporis

- affects the hairless part of the face, trunk and limbs up to the wrist and ankle
- annular, circinary to polycyclic deposits with a raised peripheral rim and central fading
- causative agents: anthropophilic *Trychophyton (T.) rubrum*, *Epidermophyton (E.) floccosum*; zoophilic (occupational disease in agriculture) *T. mentagrophytes* (source: rodents), *T. verrucosum* (cattle), *M. canis* (cats, dogs, horses).^[1]

Tinea inguinalis

- caused exclusively by anthropophilic dermatophytes
- polycyclic to map-like deposits in the groin with desquamation and a pronounced, infiltrated peripheral border
- very itchy
- originators: *T. rubrum*, *T. interdigitale*, *E. floccosum*.^[1]

Tinea manus

- relatively rare localization
- usually does not come separately
- often only one hand is affected
- on the back of the hand an appearance like tinea corporis
- on the palm, an appearance similar to eczema or psoriasis - deposits of hyperkeratosis or dyshidrotic vesicles
- diagnosis requires microscopic and culture mycological examination.^[1]

Tinea pedis

the most common dermatophytosis

- affects up to 50% of the adult population
- originators: *T. rubrum* (the most common), *T. interdigitale*, *E. floccosum*; yeast micromycetes: *Candida*, *Trichosporon*
- tinea interdigitalis**
 - starts as redness and whitish maceration in the last interfinger, itching
 - continues as mild dry desquamation, does not itch, spreads to other intertoes
 - risk of bacterial superinfection with pseudomonads and diphtheroid bacilli – oozing, erosion, edema and phlegmonous inflammation of the fingers
 - permanent tendency to relapse
- tinea plantaris**
 - squamous or vesicular form, very itchy
- consistent local treatment - 2 times a day, continue for another 2-3 weeks after clinical healing.
- prevention: antihidrotics, breathable shoes, cotton socks, frequent ventilation of the feet, disinfection of shoes with an antifungal spray, use of antifungal products after visiting an indoor pool or communal showers^[1]

Tinea unguium (onychomycosis)

- usually follows interdigital tinea pedis
- in diabetics, bruises caused by deformed nails can cause gangrene of the fingers^[1]

Cutaneous candidiasis

 For more information see Candidosis.

- most common causative agents: *Candida (C.) albicans*, *C.*



Oral candidiasis after antibiotic treatment



Microsporum canis



Tinea corporis due to *Trichophyton mentagrophytes*

parapsilosis, *C. tropicalis*, *Trichosporon mucoides*

- commensals on the mucous membranes of the digestive and genital tract
- in the presence of predisposing factors, they can multiply significantly (maceration of the skin in the places of moist boils, altered skin metabolism in patients with diabetes, immunodeficiencies)
- manifestations near the orifices (cheilitis angularis, vulvovaginitis, perianal candidiasis)
- manifestation in places of moist sores in skin folds (candidosis intertriginosa, interdigital candidiasis of the hands)
 - itchy redness with a central rash, lined with white macerated scales; cloudy vesicles to pustules^[1]



Trichophyton rubrum

Keratomycoses

Keratomycosis is a disease process affecting only the stratum corneum epidermis.

Pityriasis versicolor

- causative agent: lipophilic yeast *Malassezia furfur*
- predisposing factors: hyperhidrosis, occlusive clothing, seborrhoea, immune disorders
- light brown macules on non-pigmented skin and, conversely, white macules on pigmented skin
- the deposits peel off in a pityriaziform manner when scratched, the causative agent can be demonstrated microscopically in the scales
- usually does not cause subjective problems
- low infectivity, transmitted directly or by using infected bedding or personal linen
- very frequent relapses
- the largest reservoir is Kštica
- differential diagnosis: vitiligo
- local whole-body treatment with antifungal shampoo^{[1][3]}



Severe form of tinea pedis



Candida albicans

Erythrasma

- causative agent: *Corynebacterium minutissimum*
- the most common localization: places of moist heat, especially the groin area, occasionally also the armpits
- sharply defined red-brown, slightly peeling areas; slightly itchy
- more often affects men, especially obese, excessive sweating
- low infectivity^[3]

Diagnostics

- clinical picture;
- microscopic examination;
- culture mycological examination;
- serology.^[3]

Treatment

Topical treatment

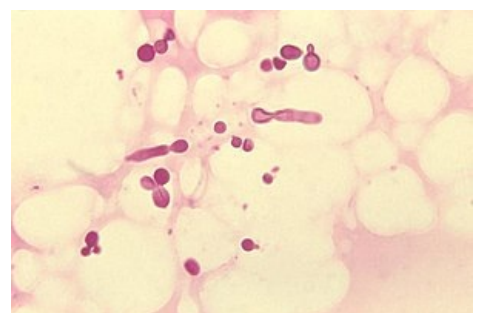
- **imidazole derivatives** (clotrimazole, bifonazole, econazole)
 - broad-spectrum antifungal preparations
 - bifonazole also has an antibacterial and anti-inflammatory effect, it has good penetration into the deeper layers of the epidermis
- **allylamines** (terbinafine)
 - very effective against dermatophytes
- **polyenes** (nystatin, natamycin)
 - they work well against yeast^[1]

Systemic treatment

- **ketoconazole**
 - short-term treatment of tinea cruris, tinea pedis, pityriasis versicolor



Pityriasis versicolor



Short hyphae of *Malassezia furfur* on the skin scale of a patient with Pityriasis versicolor

- potentially hepatotoxic, not recommended for children
- **itraconazole**
 - the widest spectrum of effectiveness – effective against dermatophytes and yeasts, including nail plate diseases
- **terbinafine**
 - very effective against dermatophytes, also used in the treatment of onychomycosis
- **fluconazole**
 - most secure
 - well effective against yeasts, less effective against dermatophytes^{[1][3]}

Sorce

Related articles

- Dermatophytosis
- Mycoses • Invasive fungal infections • Antimycotics

Reference

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2. SHELL, Magdalena. Dermatomycosis - current problem. *Dermatology for practice* [online]. 2010, y. 4, p. 144–146, Available from <http://www.dermatologiepropraxi.cz/artkey/der-201003-0007_Dermatomykozy_8211_aktualni_problem.php>. ISSN 1803-5337.
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