

**Institute for Microbiology, Medical Faculty of Masaryk University
and St. Anna Faculty Hospital in Brno**

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Agents of skin-manifested infections – II

**The 11th lecture for 3rd-year students of dentistry
9th December, 2010**

Infections with skin symptoms – revision

1. primary skin infections
2. secondary infections of already diseased skin
3. skin symptoms of systemic infections

Etiology: bacterial

viral

fungal

parasitic

Primary acute bacterial skin infections I – revision

- acne vulgaris – *Propionibacterium acnes*
- carbunculus nuchae – *Staphylococcus aureus*
- ecthyma gangraenosum – *Pseudom. aeruginosa*
- erysipelas – *Streptococcus pyogenes*
- erysipeloid – *Erysipelothrix rhusiopathiae*
- erythema migrans – *Borrelia burgdorferi*
- erythrasma – *Corynebacterium minutissimum*

Primary acute bacterial skin infections II – revision

- folliculitis – *Staph. aureus*, *P. aeruginosa*
- furunculosis (boil) – *Staphylococcus aureus*
- hidradenitis suppurativa – *Staph. aureus*
- hordeolum (stye) – *Staph. aureus*
- impetigo – *Staph. aureus*, *Str. pyogenes*
- lymphangoitis – *Streptococcus pyogenes*
- panaritium – *Staphylococcus aureus*
- paronychium – *Staphylococcus aureus*
- sycosis barbae – *Staphylococcus aureus*

Primary chronic bacterial skin infections – revision

actinomycosis – *Actinomyces israelii*

chronic subcutaneous abscesses – *A. israelii*, *Nocardia asteroides*,
Rhodococcus equi

skin granulomas – *Mycobacterium marinum*, *M. haemophilum*, *M. chelonae*

leprosy – *Mycobacterium leprae*

lupus vulgaris – *Mycob. tuberculosis*

scrophuloderma – *M. tuberculosis*, *M. bovis*

Secondary infections of skin lesions – revision

decubitus (bedsore), trophic ulcer – neighbouring and endogenous flora (staphylococci, streptococci, enterococci, enteric bacteria, pseudomonads and other Gram-negative non-fermenting rods, anaerobes, yeasts)

infected atheroma – *S. aureus*, *Propion. acnes*

infected intertrigo (raw) – *S. aureus*, *P. acnes*

sec. infected dermatomycoses – *S. pyogenes*

infected wounds – discussed in previous lecture (esp. staphylococci, streptococci & clostridia)

Skin symptoms of systemic bacterial infections – revision

roseola (rash in typhoid fever) – *Salmonella Typhi*

disseminated gonorrhoea – *Neisseria gonorrhoeae*

infective endocarditis – to be dealt with by sepsis

meningococemia – *Neisseria meningitidis*

scarlatina (scarlet fever) – *Streptococcus pyogenes*

SSSS (staphylococcal scalded skin syndrome) –
Staphylococcus aureus

toxic shock syndrome – *S. aureus*, *S. pyogenes*

syphilis (branded as a „great imitator“) –
Treponema pallidum

Etiology of skin fungal infections – revision

Etiology differs in

- **superficial mycoses, like pityriasis versicolor**
– *Malassezia furfur* (prev. *Pityrosporum ovale*)
- **mucocutaneous mycoses** – *Candida albicans*
and other species of candidae
- **cutaneous mycoses** – typical dermatophytes
- **subcutaneous mycoses**
- **opportunistic skin mycoses** in immunodeficient

Etiology of cutaneous mycoses – revision

tinea pedis – *Trichophyton rubrum*, *Trich. mentagrophytes* var. *interdigitale*,
Epidermophyton floccosum

onychomycosis – *Trich. rubrum*, *Epid. floccosum*

tinea corporis – *Trich. rubrum*, *Microsporum canis*, *Micr. gypseum*, *Trich. mentagrophytes* var. *mentagrophytes*, *Epid. floccosum*

tinea capitis, type **ectothrix** – *M. gypseum*, *Micr. canis*, *Micr. audouinii*, *T. mentagrophytes* var. *mentagrophytes*, *Trich. verrucosum*

type **endothrix** – *Trich. tonsurans*

favus – *Trichophyton schoenleinii*

Etiology of subcutaneous mycoses – revision

- pheohyphomycosis** (lesions with pigmented hyphae) – genera *Alternaria*, *Aureobasidium*, *Cladosporium*, *Culvularia*, *Exophiala*, *Phaeoannelomyces*, *Phoma*, *Wangiella* & others
- chromoblastomycosis** (warty nodules with sclerotic bodies) – *Cladophialophora*, *Fonsecaea*, *Phialophora*
- mycetoma eumycoticum** (swollen lesion with draining tracts containing small grains) – *Acremonium*, *Exophiala*, *Madurella*, *Pseudoallescheria* (= *Scedosporium*)
- sporotrichosis** – *Sporothrix* *schenckii* (dimorphic fungus)

Etiology of opportunistic skin mycoses in immunodeficiencies – revision

Fusarium solani, *Fusarium oxysporum*,
Fusarium verticillioides

Pseudoallescheria boydii (= teleomorph,
sexual phase of anamorph *Scedosporium*
apiospermum)

Penicillium marneffei (systemic infection
with skin manifestations – in AIDS)

Scopulariopsis brevicaulis

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Skin symptoms in viral diseases – I

Macular (spotted) exanthem:

morbilli – morbilli virus (*Morbillivirus* genus)

rubella – rubella virus (*Rubivirus* genus)

erythema infectiosum (the fifth disease) –
parvovirus B19 (*Erythrovirus* genus)

exanthema subitum (roseola infantum, the
sixth disease) – human herpesvirus 6
(HHV 6, *Roseolovirus* genus)

some **echovirus infections** – >30 serotypes
(*Enterovirus* genus)

Skin symptoms in viral diseases – II

Umbiliform papulae:

**molluscum contagiosum – molluscum
contagiosum virus (*Molluscipoxvirus*
genus)**

Skin symptoms in viral diseases – III

Vesicles:

herpes simplex (cold sore) – herpes simplex virus type 1 (HSV 1, *Simplexvirus* genus)

herpes genitalis – HSV 2 (*Simplexvirus* genus)

varicella (chicken pox) – primary infection by varicella-zoster virus (VZV, *Varicellovirus* genus)

herpes zoster (shingles) – activation of latent infection by varicella-zoster virus

variola vera (smallpox, now eradicated) – variola virus (genus *Orthopoxvirus*)

(continued)

Skin symptoms in viral diseases – IV

Vesicles – cont.:

vaccinia – vaccinia virus (for vaccination against variola, *Orthopoxvirus* genus)

cowpox, monkey pox – cowpox and monkey pox viruses (*Orthopoxvirus* genus)

tubera mulgentium (milkers' nodules) – milker's nodule virus (*Parapoxvirus* genus)

aphthae epizooticae (foot and mouth disease) – foot-and-mouth disease virus (FMDV, *Aphthovirus* genus)

hand, foot and mouth disease – coxsackievirus A16 (*Enterovirus* genus)

Skin symptoms in viral diseases – V

Petechiae:

hemorrhagic fevers –

Ebola fever, Ebola virus (*Ebolavirus* genus)

Marburg disease, Marburg virus (genus *Marburgvirus*)

Lassa fever, Lassa virus (*Arenavirus* genus)

generalized congenital cytomegalic disease –

cytomegalovirus (CMV, *Cytomegalovirus* genus)

Skin symptoms in parasitoses – I

Domestic (native) parasitoses:

scabies – itch mite (*Sarcoptes scabiei*)

demodicosis – human follicle mites (members of *Demodex* genus)

pediculosis capitis – head louse (*Pediculus capitis*)

pediculosis corporis – body louse (*Pediculus humanus*, syn. *Pediculus corporis*)

pediculosis pubis (phthiriasis) – pubic (crab) louse (*Phthirus pubis*)

dermatitis cercariosa – cercariae of avian and mammalian schistosomes non-pathogenic for man

Skin symptoms in parasitoses – II

Infestation by native ectoparasites:

cimicosis, urticaria cimicosa – bites by bedbug
Cimex lectularius

pulicosis – bites by human flea *Pulex irritans*,
dog flea *Ctenocephalides canis*,
cat flea *Ctenocephalides felis*,
chicken flea *Ceratophyllus gallinae*

ixodosis – bite by hard tick *Ixodes ricinus*

culicosis – bites by common mosquitoes, e.g.
Culex pipiens

trombiculosis, trombidiosis – bites by
Neotrombicula autumnalis larvae

Skin symptoms in parasitoses – III

Tropical parasitoses:

- ulcus humidum** (humid ulcer) – countryside in Near and Middle East, northern and western Africa; *Leishmania major*
- ulcus siccum** (dry ulcer, oriental sore) – cities in Near and Middle East, seats in northern and eastern Africa; *Leishmania tropica*
- espundia** (severe, even fatal disease) – South America; *Leishmania braziliensis*
- tungosis** (sore caused by skin-burrowed female of chigoe or sand flea) – subtropical and tropical America and Africa; *Tunga penetrans*
- dracunculosis** (Guinea worm disease, „the fiery serpent“) – now in Africa only; *Dracunculus medinensis*
- Loa loa filariosis** (loiasis, Calabar swellings) – West Africa (Cameroon); filariae *Loa loa*
- onchocerciasis** (river blindness; various skin signs, e.g. „leopard skin“) – Africa, Middle and South America; filariae *Onchocerca volvulus* and their endosymbiont *Wolbachia pipientis*

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Homework 11

Please give the name of the author and of the painting



Answer and questions

The solution of the homework and possible questions please mail (on 6.30 a.m. at the latest) to the address

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Thank you for your attention