



MICROBIOLOGY

Lecture 7 - 10

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Most Important

ملخص لأهم النقاط و المعلومات الموجودة في السلايدات لغايات المراجعة و تثبيت الحفظ

Syphilis

Treponema pallidum

EPIDEMIOLOGY	<ul style="list-style-type: none">• exclusively human pathogen• Infection is acquired from direct sexual contact with a person who has an active primary or secondary syphilitic lesion• Less commonly,<ul style="list-style-type: none">– Non-genital contact with a lesion (e.g., of the lip),– sharing of needles by intravenous drug users,– transplacental transmission to the fetus within approximately the first 3 years of the maternal infection.
Pathogenesis	<p>The primary syphilitic lesion Papule...ulcer,,,,indurated and ulcerates but remains painless (chancre).</p> <p>Secondary syphilis Symmetric non itchy muco -cutaneous maculopapular rash generalized non-tender lymph node enlargement fever and malaise.</p> <p>Latent Syphilis +In the first few years latency (early phase) may be interrupted by progressively less severe relapses of secondary syphilis +In late latent syphilis (>4 years) relapses cease</p> <p>Tertiary Syphilis The manifestations may appear as early as infection but characteristically occur of patients with untreated syphilis 5 years after infection but characteristically occur after 15 to 20 years.</p>
DIAGNOSIS	<p>Microscopy :</p> <ul style="list-style-type: none">• T. pallidum in primary and secondary lesions can be seen by darkfield microscopy.+ Direct fluorescent antibody methods have been developed but are available only in certain centers.
TREATMENT AND PREVENTION	<ul style="list-style-type: none">• T. pallidum remains exquisitely sensitive to penicillin, which is the preferred treatment in all stages. In penicillin-hypersensitive patients with neurosyphilis or congenital syphilis be desensitized rather than use an alternate antimicrobial.• No vaccine is available so far.• In primary, secondary, or latent syphilis persons hypersensitive to penicillin may be treated with tetracyclines, erythromycin, or cephalosporins.

Tertiary Syphilis

Neurosyphilis

- Neurosyphilis is due to the damage produced by a mixture of meningo-vasculitis and degenerative parenchymal changes in virtually any part of the nervous system.

Cardiovascular syphilis

- arteritis involving the vasa vasorum of the aorta , dilatation of the aorta and aortic valve ring leading to aneurysms of the ascending and transverse segments of the aorta and/or aortic valve incompetence.

Congenital Syphilis

- Fetuses are susceptible to syphilis only after the fourth month of gestation. Bone involvement produces characteristic changes in the architecture of the entire skeletal system (saddle nose, saber shins, Hutchinson teeth, hearing loss). Anemia, thrombocytopenia, and liver failure are terminal events.

Non-treponemal tests	Treponemal tests
<ul style="list-style-type: none">• Antibody directed against cardiolipin (lipid complex) (reagin)	<ul style="list-style-type: none">• antibody specific to <i>T. pallidum</i>
<ul style="list-style-type: none">• Rapid plasma regain• Venereal Disease Research Laboratory (VDRL)	<ul style="list-style-type: none">• Fluorescent treponemal antibody (FTA-ABS)• <i>T. pallidum</i> hem-agglutination (TPHA)• the microhem-agglutination test for <i>T. pallidum</i> (MHA-TP).
<ul style="list-style-type: none">• Nonspecific*	<ul style="list-style-type: none">• Specific
<ul style="list-style-type: none">• Sensitivity and low cost :preferred for screening<ul style="list-style-type: none">○ if positive, they must be confirmed by one of the more specific treponemal tests	<ul style="list-style-type: none">• not useful for screening<ul style="list-style-type: none">○ Positive result confirms RPR and VDRL
<ul style="list-style-type: none">• following treatment	<ul style="list-style-type: none">• They are not useful for following therapy (once positive, they usually remain so for life)
<ul style="list-style-type: none">▪ With successful antibiotic therapy nontreponemal serologies slowly revert to negative.	<ul style="list-style-type: none">• The treponemal IgM tests are useful in establishing the presence of an acute infection in infants (congenital syphilis)

Trichomoniasis

- T. vaginalis despite its name, infects both men and women.
- It lacks a cyst form but the trophozoite survives 1-2 hours outside the host on moist surfaces.
- In urine, semen, water, it is viable for up to 24h

Diagnosis:

Specimens: Vaginal discharge (female) + Urine sediment after prostate massage

1. **Vaginal pH (normally 3.8-4.5)**: Bacterial vaginosis, trichomoniasis, and atrophic vaginitis often cause a vaginal pH higher than 4.5.

2. **Whiff test** : Upon application of 10% potassium hydroxide (KOH) to a vaginal swab sample, a fishy odor is released, which can suggest trichomoniasis or bacterial vaginitis.

3. **Wet mount (Vaginal smear)** : Performed on vaginal swab specimens (or male urine sediment) resuspended in a drop or 2 of saline

4. **Culture** : Diamond's medium with antifungal and antibacterial additives

5. **Direct immunofluorescence assay**

6. **Polymerase chain reaction**

Rapid antigen detection

- Dipstick from Genzyme
- Antibodies on stick capture T.vaginalis antigen in specimen
- Sensitivity slightly better than wet mount microscopy ~80%

Treatment

- Metronidazole 2 g orally in a single dose
- Tinidazole 2 g orally in a single dose
- Metronidazole 500 mg orally twice a day for 7 days

Ectoparasitic infections

Pubic Lice

Epidemiology	<ul style="list-style-type: none">• infect a new host only by close contact between individuals, usually through sexual contact.• child infestations are more likely to occur through routes of shared towels, clothing, beds or closets.• Adults are more frequently infested than children.
Transmission	++During sexual contact (Nonsexual transmission of public lice is also possible) ++can live away from the body for as long as 2 days--can drop off onto underclothes, bedsheets, etc, ++Condoms do not prevent the spread of pubic lice.
Clinical Manifestations	Crab lice favour the hairs of the genital and peri-anal region. male patients, pubic lice and eggs can also be found in hair on the abdomen and under the armpits as well as on the beard. itching, usually in the pubic hair area. It results from hypersensitivity to louse saliva,
Diagnosis	carefully examining pubic hair for nits, nymphs and adults. A magnifying glass or a stereo-microscope can be used for the exact identification.
Treatment	-medicinal lotion (1% permethrin or pyrethrin) applied to all affected areas + all areas w/body hair (genitals, armpits,scalp, even eyebrows) • Ivermectin paralyzes and kills lice and their eggs

Life cycle

egg (also called a nit): Hard to see and are found firmly attached to the hair shaft. They are oval and usually yellow to white, it takes about 6-10 days to hatch.

Nymph :

*immature louse + looks like an adult pubic louse but it is smaller.

* Pubic lice nymphs take about 2-3 weeks after hatching to mature into adults capable of reproducing. To live, a nymph must feed on blood.

adult.

*resembles a miniature crab

*Pubic lice have six legs; their two front legs are very large and look like the pincher claws of a crab.

* Pubic lice are tan to grayish-white in color.

• Females lay nits and are usually larger than males.

• To live, lice must feed on blood.

Scabies

highly contagious , can survive up to 14 days away from a host, but often do not survive longer than two or three days away from human skin.

Diagnosis

- observing the characteristic burrows of the mites causing scabies.
- A sterilized needle can be used to explore the pearly bump at the end of a burrow, remove its contents, and place it on a slide to be examined. The mite itself may then be identified.

Treatment

- Treatment by several types of lotions (usually containing 5% Permethrin) can be applied to the body and left on for 12 to 24 hours. One topical application is usually sufficient.
- Itching can be lessened by the use of calamine lotion or antihistamines.

Human Papilloma Virus (HPV)

- Non enveloped DNA viruses
- Several subtypes associated with cancer pathogenesis – Squamous Cell Carcinoma (SCC) of skin, mucosa, cervix, etc
- **HPV types 6 and 11** low-risk HPVs because they don't tend to progress beyond warts.
- High-risk HPV types like types **16 and 18** have a high risk of transforming into cancers
- Common skin warts of the hands or nails
- Plantar warts on the soles of the feet
- Flat warts of the face and extremities
- Filiform warts of the face

Genital Warts (Condyloma Acuminata)

- Anal and genital infections
- painless, they can cause itching, burning, local pain, or bleeding.
- When seen in children, may or may not indicate sexual abuse
- When seen around orifices (anus;vagina) important to investigate further as infection in rectum/vagina more likely to lead to squamous dysplasia and SCC

Transmission: Sex ,Child birth ,Sharing clothes , Auto-incubate

HIV

- viral infection that destroy helper T cells of the immune system
- long incubation periods
- Retroviruses transcribe RNA to DNA
- Enveloped virus
- These knob-like structures responsible for binding to target cell.