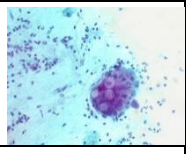
Chlamydia, Syphilis & Gonorrhea

Chlamydia [thin discharge]	
General	• An **obligate intracellular** bacteria with elements of bacteria but NO rigid cell wall. • **Fail to grow** on artificial media • Uses host cell metabolism for growth and replication. • Image of **inclusion bodies** 
Cycle [Pic]	• Elementary body [small infectious particle found in secretions] • EB attach and enter the cell --> strong immune response --> damage and scarring • within 8 hs EB transforms into reticulate body which starts to replicate and forms inclusion bodies • eventually the cell bursts and EBs are released into adjacent cells to infect them

Diseases	• C. trachomatis
	  ○ A,B,C → Trachoma
	  ○ D – K → Inclusion conjunctivitis, genital infection
	  ○ L1, L2, L3 → Lymphogranuloma venerum (LGV)
	• C.psittaci → Psittacosis
	• C.pneumoniae →Respiratory infections

epidemiology	• C.trachomatis is a **common cause** of sexually transmitted disease (**STD**). • Spread by **genital secretions** , anal or oral sex. • Wide spread, 5-20 % among STD clinic in USA. • **Human** are the sole reservoir . • **1/3** of male sexual contacts of women with C.trachomatis cervicitis **develop urethritis** after 2-6 weeks incubation period.
Pathogenesis	• Chlamydia have **tropism** for epithelial cells of **endocervix and upper genital tract** of women, **urethra, rectum and conjunctiva** of both sexes. • **LGV can enter through skin or mucosal breaks** • Release of **proinflammatory cytokines**, leads to tissue infiltration by inflammatory cells, progress to **necrosis, fibrosis then scaring.**
Genital infections caused by C.trachomatis	• In men: urethritis (non gonococcal urethritis (NGU)) , epididymitis & proctitis. • In women: cervicitis, salpingitis, urethral syndrome, endometritis & proctitis. • Urethritis present **as dysuria and thin urethral discharge** in 50 % of men. • Uterine cervix infection may produce vaginal discharge but is **asymptomatic** in 50-70% of women. • Salpingitis and pelvic inflammatory disease can cause **sterility and ectopic** pregnancy. • **50%** of infants born to mothers **excreting C.trachomatis** during labor show evidence of infection during the first year of life. Most develop **inclusion conjunctivitis**, 5-10% develop infant **pneumonia syndrome**. • LGV caused by C.trachomatis strains **L1,L2,L3** • LGV is common in South America and Africa. • **Papule** and inguinal **lymphadenopathy**. • Chronic infection leads to **abscesses, strictures and fistulas.**
Dx	• **Polymerase chain reaction (PCR) or Ligase chain reaction (LCR)** are the most sensitive methods of diagnosis. Performed on vaginal ,cervical , urethral swabs, or urine . • Isolation on tissue culture **(McCoy cell line)** but it is rarely done. • **C.trachomatis inclusions** can be seen by iodine or **Giemsa** stained smear.
Tx	• **Azithromycin single dose for non- LGV infection.** • **Erythromycin for pregnant women.** • **Doxycycline for LGV.** • Prevention and control through early detection of asymptomatic cases , screening women under 25 years to reduce transmission to the sexual partner.

Gonorrhea [Purulent discharge]

Clinical

- A **STD** disease acquired by **direct genital contact**.
- It is **localized** to mucosal surfaces with infrequent spread to blood or deep tissues.
- Caused by **N.gonorrheae**.
- **Clinical manifestations: 2-5 days IP .**
- Symptoms are **similar** to Chlamydia infection.

- **Men:** acute urethritis and acute profuse **purulent** urethral discharge.
- **Women:** **mucopurulent** cervicitis, urethritis with discharge.
- **In both sexes:** urethritis ,proctitis.

- **Pharyngitis** may occur.
- **Pelvic inflammatory disease** (PID) in women:
  - PID occurs in 10-20% of cases, include **fever, lower abdominal pain, adnexal tenderness, leukocytosis** with or without signs of local infection.
  - Salpingitis and pelvic peritonitis cause **scarring and infertility.**
  - **Disseminated Gonoccocal Infection** (DGI) due to spread of bacteria to the **bloodstream**:
    - ✓ **Clinically** : Fever, migratory arthralgia and arthritis.
    - ✓ **Purulent arthritis** involving large joints.
    - ✓ Petechial, maculopapular **rash**.
    - ✓ **Metastatic infection such as Endocarditis , Meningitis & Perihepatitis may develop.**

Epidemiology

- Rates among **adolescents are high**, about 10% increase per year in USA .

- **Inability to detect asymptomatic cases such as women and patient fail to seek medical care hampers control**

- **Major reservoir** for continued spread are asymptomatic cases.
- **Non-sexual** transmission is rare.

Neisseria gonorrheae

- A **Gram negative diplococci** grows on **chocolate agar** and on selective enriched media and **CO2** required. **Not a normal flora**.

- **Pathogenesis:** mainly a localized infection of epithelium ,leads to intense inflammation.

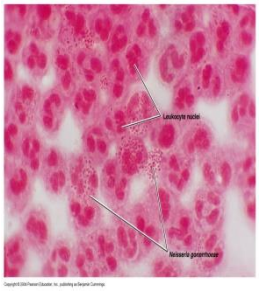
- **Posses pili and outer membrane proteins** that mediate attachment to non-ciliated epithelium.

- **Invasion** by **IA and Opa** proteins.

Dx [important]

- **Transport media required** unless transfer to the lab. is immediate.

- Direct smear for **Gram stain** of urethra and cervical specimens to see **Gram negative diplococci** within a **neutrophil (intracellular)** see picture , more sensitive in men .



- Culture on **Thayer-Martin** or other selective medium.

- Isolates identified by sugar fermentation of **glucose only** (**does not ferment maltose or sucrose**) or **Coagglutination test.**

Tx

- Guided by local resistance pattern and susceptibility testing. Partner should be treated as well.

- **Ceftriaxone IM** (or oral **Cefixime** recommended).
- **Ciprofloxacin or Ofloxacin**
- **Azithromycin, Doxycycline** (orally for 7 days) both cover C.trachomatis infection as well .

- Counseling.

Syphilis

General

- A **chronic** systemic infection , **sexually transmitted** , caused by **a spiral organism called Treponema pallidum subsp.pallidum**
- The organism **grow** on cultured mammalian cells only ,
- **NOT** stained by Gram stain but readily seen **only by immunoflurescence (IF), dark filed microscopy or silver impregnation histology technique.**

Epidemiology

- An exclusively **human** pathogen.
- Transmission by **contact with mucosal surfaces** or **blood**, less commonly by non-genital contacts with a lesion, sharing needles by IV drug users, or **transplacental transmission** to fetus.
- **Early** disease is infectious.
- **Late** disease is not infectious .

Pathogenesis

- Bacteria access through inapparent skin or mucosal breaks.
- Slow multiplication produces **endarteritis & granulomas.**
- **Ulcer heals** but **spirochete disseminate.**
- **Latent periods** may be due to surface binding of host components.
- **Injury is due to delayed hypersensitivity responses to the persistence of the spirochetes.**

Dx

- **Dark field microscopy** of smear from primary or secondary lesions. May be negative.
- **Serologic tests**: commonly used .

- **Nontreponemal tests:**
  - antibody to cardiolipin (lipid complex extracted from beef heart) , anticardiolipin antibody called **reagin** .
  - The tests are called rapid plasma reagin **(RPR)** and venereal disease research laboratory **(VDRL).**
  - Become positive during the primary stage (possible exception HIV) ,antibody peak in secondary syphilis. Slowly wane in later stages.
  - Used for **screening** .Titer used to **follow up** therapy.

- **Treponemal tests**: treponemal antigen used.
  - **Detects specific antibody to T.pallidum**
- **Fluorescent Treponemal Antibody** (FTA-ABS) .
- **Microhemagglutination test**(MHA-TP) (antigen attached to erythrocytes)

- **Positive** results confirm **RPR and VDRL.**
- **IgM** used to diagnose congenital syphilis.

SUMMARY:

- **Nontreponemal tests (RPR & VDRL)** → **Positive** during primary stage ,screening, follow up
- **Treponemal tests (FTA-ABS)&(MHA-TP)** → **Positive** at all stages , confirm **RPR & VDRL**
- **IgM antibody** → **Congenital syphilis**

Clinical stages

1- Primary syphilis:

- **chancre** is a painless, indurated ulcer with firm base and raised margins on external genitalia or cervix ,anal or oral site appear after an IP of about 2-6 weeks .
- **Enlarged inguinal lymph nodes** may persist for months.
- **Lesion heals** spontaneously after 4-6 weeks

2 - Secondary Syphilis:

- Develops 2-8 weeks after primary lesion **healed.**
- Characterized by **symmetric mucocutaneous rash** , **mouth lesions** (snail track ulcers) and generalized **non-tender lymph nodes enlargement** (**full of spirochete**) with **bacteremia** causing fever, malaise and other systemic manifestations.
- Skin lesion distributed on **trunk and extremities** often palms, soles and face.
- 1/3 develop **Condylomata Lata**: which are painless mucosal warty erosions on genital area and perineum.
- Secondary lesion **resolve after few days** to many weeks but disease continue in 1/3 of patients.

3 - Latent syphilis:

- a stage where there is no clinical manifestations but **infection evident by serologic tests**. Relapse cease.
- **Risk of blood-borne transmission from relapsing infection or mother to fetus continue**.

4 - Tertiary syphilis:

- in **1/3** of untreated cases.
- Manifestations may appear after 15-20 years or **may be asymptomatic but serological tests positive.**

Neurosyphilis:

- **chronic meningitis**, with increased cells and protein in CSF, leads to degenerative changes and psychosis.
- **Demylination** causes peripheral neuropathies.
- Most advanced cases result in **paresis** (**p**ersonality, **a**ffect , **r**eflexes, **e**yes, **s**enorium, **i**ntellect, **s**peech) due to the effect on the brain parenchyma and posterior columns of spinal cord and dorsal roots.

Cardiovascular Syphilis:

- Due to **arteritis** leads to aneurysm of aorta and aortic valve ring.
- Localized granulomatous reaction called gumma on skin, bones, joints or other organs leads to local destruction .

Congenital syphilis:

- develop if the mother not treated ,fetus susceptible after 4th month of gestation.
- Fetal loss or congenital syphilis result.
- Rhinitis ,rash and bone changes (saddle nose, saber shine) anemia ,thrombocytopenia, and liver failure.

Tx

- **Treponema is sensitive to Penicillin.**
- Hypersensitive patients treated with Tetracycline, Erythromycin or Cephalosporins
- **Prevention:** counseling.

- Syphilis, Chlamydia and Gonorrhea are main STDs ,caused by delicate organisms ,cannot survive outside the body.
- Infection may not be localized.
- Clinical presentation may be similar (urethral or genital discharge, ulcers).
- One or more organisms (Bacteria, virus, parasite) may be transmitted by sexual contact.
- Screening for HIV required .
- If not treated early may end in serious complications .

Hanan Mohamed Abdulmonem .. Good luck