**Syphilis, Gonorrhea and Chlamydia infection**

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**BACKGROUND (INTRODUCTION)**

Syphilis, gonorrhea and Chlamydia infections are mainly sexually transmitted diseases. All are caused by delicate organism, which cannot survive outside the body. So they need direct mucous membrane to mucous membrane inoculation.

**Syphilis** is caused by aspirocheatal organism called Treponema Pallidium which so far has not been cultured on artificial media. The disease has an incubated period of 2-6 weeks. It presents in different 4 stages.

**Gonorrhea** is caused by a gram negative coccus which is always oxidize positive and intracellular it is called *Neisseria gonorrhea*. It presents mainly as an acute muco purulent urethral discharge with an incubation period of 2-5days.

**Chlamydia infections** affect the urogenital system, respiratory system (atypical pneumonia) and the world wide eye disease called trachoma. Only the urogenital syndromes will be covered in this lecture. The infections are caused by Chlamydia species with different serotypes the Chlamydia trachomates is the one which cause urogenital serotypes (D-K). Chlamydiae are obligate intra cellular agents which grow only in live tissues.

**OBJECTIVES**

By the end of this lecture, the student should be able to

1. Know the causative agents of syphilis, gonorrhea and Chlamydia injection.
2. Realize that these three infections are acquired through sexual intercourse.
3. Know the pathogenesis of syphilis, gonorrhea and Chlamydia infection.
4. Describe the clinical feature of the primary, secondary tertary syphilis and following complications.
5. Re call the different diagnostic methods for the different stages of syphilis.
6. Describe the clinical feature of gonorrhea that affect only men, only women and those ones which affect both sexes.
7. Describe the different laboratory tests for the diagnosis of gonorrhea including microscopy of the discharge and culture of the organism on selective media.
8. Describe the morphology and the distinct life cycle of the Chlamydia.
9. Realize what are the different genera, species and serotypes of the family chlamydiphia.
10. Recognize that Chlamydia cause different disease that affect, the eye (causing trachoma) the respiratory system (mainly cause a typical pneumonia).
11. Know the different urgenital clinical syndromes caused by Chlamydia trachomatis that affect men, women and both sex.
12. Realize that these urogenital syndromes are different to differentiate clinically from the similar ones caused by N-gonorrhea eg: gonococcal urethritis.
13. Know the different treatment of syphilis, gonorrhea and Chlamydia infection
14. Realize that there are no effective vaccines against all these three diseases.

**PRINCIPLE POINTS TO BE DISCUSSED**

**Syphilis**

**Definition**: A Chronic systemic infection caused by *treponema palladium*; usually sexually transmitted ,it only affect humans, starts after 2-6 weeks incubation by a primary phase lesion (chance) follow by a secondary phase leading to latent and tertiary phases.

**Etiology:** It causes the.*T. palliduim* is unstainable by normal stains and unculturable on artificial media.

**Pathogenesis:** The disease **infect only humans** and casually transmitted by penetrating the mucous membrane it can be transmitted congenitally (tansplancently) and rarely by blood transfusion. The primary lesion persists for 4-6 weeks (the chance) which appears mainly in the male and female genitalia later it proceed to the secondary stage and later the latest stage which the organisms are dormant in pathological lesions called gamma the latent lesion proceed to tertiary stage affecting certain organs.

**Clinical features:**

**Primary syphilis:** Start as a papule on the genitalia, penis, anal canal, cervix, labia, and the mouth. The lesion is indurated and pain less it is very infectious it stays for 4-6 weeks with inguinal lymph node enlargement.

**Secondary syphilis:** It is a systemic stages in with bacteriaemia, characterized by generalized skin rash, fever, generalizes non tender lymphadenopathy and diffuse mucoulanwous lesions that can affect the mouth (snail track ulcers). The general clinical feature accompanying fever also appear like, malaise, head ache, weight loss etc

**Latent syphilis:** Divided into early latent <one year and late latent > one year. In both organisms are dormant. The pathology is mainly endarteritis

**Tertiary syphilis (late syphilis):** It affects most organs the most important of these organs are 1.central nervous system (CNS): This a manifestation of syphilis starting asymptomatically only diagnosed by positive serological tests.

**Symptomatic neurosyphilis:** It could be early

1. Meningeal that affects the meninges.
2. Meningo vocular that allect the meninges and blood vessels
3. Parenchymalaus that affect brain substance.

**The late effects on the CNS are:**

1. *General* *Parasis* of the *insane* (G.P.I) which affects the parenchyma of the brain, the patient presents with parasis and change of personality i.e. losing memory, due to the effect on the frontal lobe.
2. Tabes dorsalis: affects the posterior columns of the spinal card and dorsal roots which may lead to a typical gate, ataxia, incontence etc.

**Congenital syphilis**: Due to transplacental infection of the fetous the presentation can be lead to still fetous, abnormalities, but can also resemble secondary or late syphilis features.

**Lab diagnosis:** Cannotbe stained or cultured.

1. Primary syphilis can be diagnosed microscopically by dark field illumination or silver impregnation

Diagnosis is mainly serological tests i.e. looking for antibodies against the infecting organism.

1. Non specific tests use cardiolipin antigen e.g. VDRL
2. Specific test using treponemal antigens these tests are- FTA abs- or TPHA

**Interpretation of the test**,

VDRL and RPR are positive in primary syphilis and disappear after 2 years and their titre goes down with treatment.

**Specific test:**

(FTA abs and TPHA) are positive through all the stages.

**Treatment:**

Penicillin is the drug of choice.

In allergic patient to penicillin use erythromycin or tetracycline.

**PRINCIPLE POINTS TO BE DISCUSSED**

**Gonorrhea:**

**Definition:**

A sexually transmitted disease (S.T.I) of epithelium commonly presenting as urethritis, cervicitis, proctitis and conjunctivitis-untreated infection of those sites can lead to local complications as endometritis, salpingitis, tubuovaria abscess, peritonitis and perihepatitis. It can also disminute to cause bacteriaemia, endocarditis, meningitis and reactive arthritis.

**Etiology:**

Gram negative diplococci which are usually intra cellular and are oxidize positive and ferments glucose (remember Gonorrhea Glucose)

**Pathogenesis:**

Strains having pilli attaché to epithelium and intiate inflammation characterized by acute inflammation with profuse production of pus cells.

**Clinical manifestation:**

In males:

* Acute urethritis: Is in the most common presentation
* Acute profuse urethral discharge

With an incubation period of 2-5 days

* Severe burning micturition (pain during passing urine)
* Increase in frequency

**Gonorrhea in women:**

* Mucapurutent Cervicitis is the most common presentation
* Urethritis with discharge

**In both sexes (male and female)**

* Urethritis
* Proctitis
* Phoryagilis

**Complications in males: include epidimyetis orchilis**

In females: endometritis fallopian tube infection (Salpingitis) In both sex: systemic infection can include bacteriaemia, endocarditis perihepatitis meningitis and most common reactive arthritis.

**Diagnosis:**

Demonstration of intra cellular gram negative diplococci in **urethral discharge** in males and **cervical discharge** in female.

Culture on selective media like:

1. Thayer-matein on NewYark city medium

Treatment depends susceptibility testing. Empiric therapy: ceftriaxone. If Chlamydia infection is suspected usually use Azithromycin.

**CHLAMYDIA INFECTION**

**Definition**:

Infections caused by the genus Chlamydia which are obligate (strict) intracellular bacteria.

**Etiology:**

Chlamydiae are obligate intracellular bacteria that cannot produce their own energy so they depend on the host for supply of energy for growth and replication.

Different species and different serotypes are found

These are: Chlamydia trachomatis which has the following serotypes.

A B C- That cause trachoma, a human disease which is the commonest cause of blindness in the world.

D K - Which cause genital infection and inclusion conjunctivitis in humans

L1 L2 L3- Which cause lymphagranuloma venerumin in humans

*Chlamydia pneumonia*: Which cause respiratory infection in humans

Chlamydia psittaci: Which cause disease in parrots and can infect human causing ornithosis or psittacosis.

**Pathogenesis**

The majority of infections are caused by C.tracchomatis which causes sexually transmitted disease. It is an intracellular organism. it infect the columnar epithelium of the eye and genital tract, the infection persis for long periods the organism lives intracellular and has a characterite life cycle characterized by element bodies which are the infectious particles and neliculate bodies which are metabolically active and not infectious(see the diagram)

**Clinical manifestation:**

It causes the following:

Non gonococcal(NGU)and postgonococcal urithritis, these are the commonest sexually transmitted disease encountered in developed countries. It usually accompany gonococcal urethritis. It presents with dysuria and discharge, less then the discharge of gonococcal urethritis with no gram negative cocci organism seen.

**In men**: this can proceed to epididmitis

**In women**: can proceed to salpingits, urethreal syndrome and endomelntis

In women it can also proceed to mucopurulent cervicitis and pelvic inflammatory disease (PID)

In both sex it can cause Proctitis

In new born can inclusion conjunctivitis

Serotypes, L1 L2 L3 of Chlamydia trachomatis cause lymphgranulama venereum which is characterized by a papule and inguinal lymphadenopathy.

**Diagnosis:**

By microscopy look for inclusion bodies stained by *iodine* or *Giemsa* in the discharge.

**Culture:**

Cannot grow on artificial medicine but can grow an MCOY cell lines which can then be stained by *iodine* or *geimsia.*

**P C R**

Can be used as well

**Treatment**

Macrolids e.g.; azithromycin, erythromycin or doxycycline

**TAKE HOME MESSAGES**

1. Syphilis, gonorrhea and Chlamydia infection are mainly sexually transmitted disease they are caused by *Treponema*. *Pallidium* which is un stainable by simple stains and also non culturable. Chlamydia tachometis the cause of Chlamydia genital and eye infectious is non culturable on artificial medium. But N.gonorrhoea is stainable by gram stain and culturable on selective media
2. Although these infection are sexually transmitted they are not localized to the genital organs as they can spread in both sex to pelvic organs and systemically
3. Syphilis has 3 different stages`

Primary chance on genitalia which is the most infectious, secondary stage with more profound clinical features, latent which develop in late stage affecting the cardiovascular and central nerves in which the pathology is mainly endarteritis

1. Diagnosis of gonorrhea is by microscopy of discharge by presence of pus cells and gram negative intra cellular cocci and culture on selective media Diagnosis of syphilis is by Microscopy primary dark field or silver impregnate

Serology- secondary latent are the non

1. Non specific antigen-e.g. test

b) Specific antigens

**Treatment (specific)**

* Syphilis-Penicillin  
  - Gonorrhea- Ceftriaxone
* Chlamydia –Azithromycin
* Azithromycin can cover all three infections