قال الله عزوجل : "وَلاَ تَقْرَبُواْ الزِّنَى إِنَّهُ كَانَ فَاحِشَةً وَسَاء سَبِيلاً [الإسراء:٣٢]

Urogenital Tract / 3rd year
Gonorrhoea

Dr Hamed Al-Zoubi MD, PhD
Associate Prof. of Medical Microbiology

Top ten Sexually Transmitted Diseases (STDs)

Organism	Disease
Papillomaviruses (types 6 and 11 associated with visible genital warts)	Genital warts, dysplasias
Chlamydia trachomatis (D–K serotypes)	Non-specific urethritis
C. trachomatis (L1, L2, L3 serotypes)	Lymphogranuloma venereum
Candida albicans	Vaginal thrush, balanitis
Trichomonas vaginalis	Vaginitis, urethritis
Herpes simplex virus types 1 and 2	Genital herpes
Neisseria gonorrhoeae	Gonorrhea
HIV	AIDS
Treponema pallidum	Syphilis
Hepatitis B virus	Hepatitis
Haemophilus ducreyi	Chancroid

Epidemiology

- A total of 400,000 cases of gonorrhea reported annually in the United States

- Rates of positive urethral gonorrhea tests usually higher in HIV-positive MSM compared to HIV-negative MSM.

- gonococcal infection in men have historically been higher than in women, a difference ascribed mainly to the higher incidence of asymptomatic disease in women and the occurrence of infection among men having sex with men (MSM).
- Control of gonococcal infections is also hampered by the emergence of antibiotic resistance and reinfection by untreated sexual partners

Gonorrhoeae

- ***Caused by Neisseria gonorrhoeae (gonococcus)*** **:**

- Gram negative diplococcic (kidney beans), oxidase positive non-capsulated

- Sensitive to dehydration and cool conditions

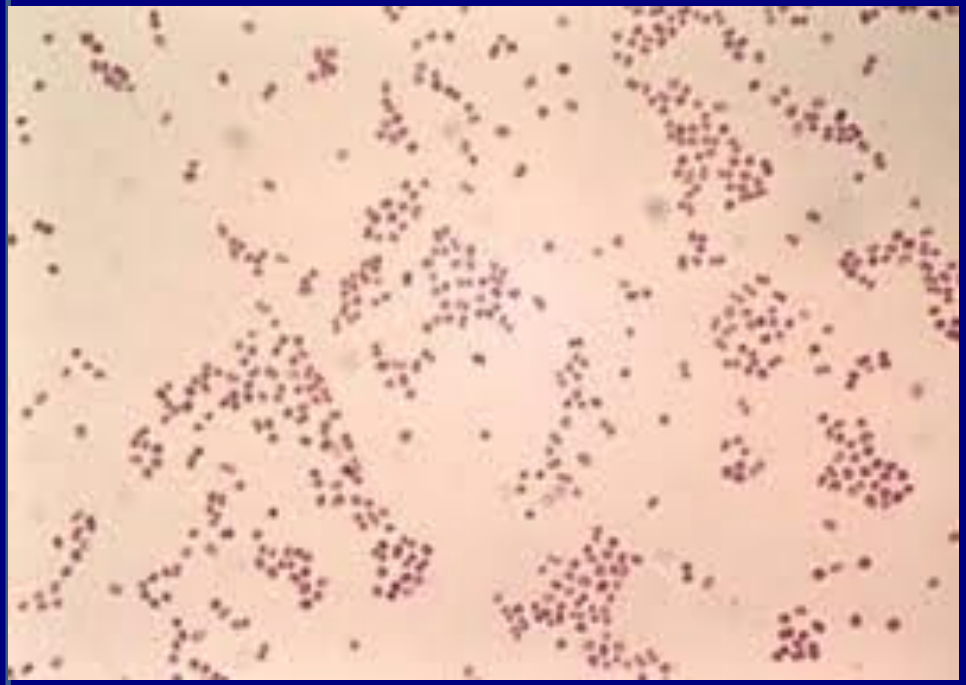
- Glucose fermenter but not maltose or lactose

- Infects humans only but Not part of the normal flora (infection can be asymptomatic)

Gonorrhoeae

- Virulence factors:
- Pili and IgA protease
- Endotoxin (LOS) and outer membrane protein (OMP)
- Immunity:
- IgA, IgG, complement and neutrophils
- Repeated infections occur because of antigenic variability in Pili and OMP
- Gonococccci infect mucosal surface such as urethra and vagina, cervix, rectum, pharynx and conjunctiva
- Can be disseminated especially in patients with late complement deficiency (C6-C9)

Gonorrhoeae



Pathogenesis

1. **Attachment:**

Attachment is mediated by Pili, Opa, and LOS

2. **Invasion:**

Opa & protein 1A mediate the gonococci uptake by the epithelial cells

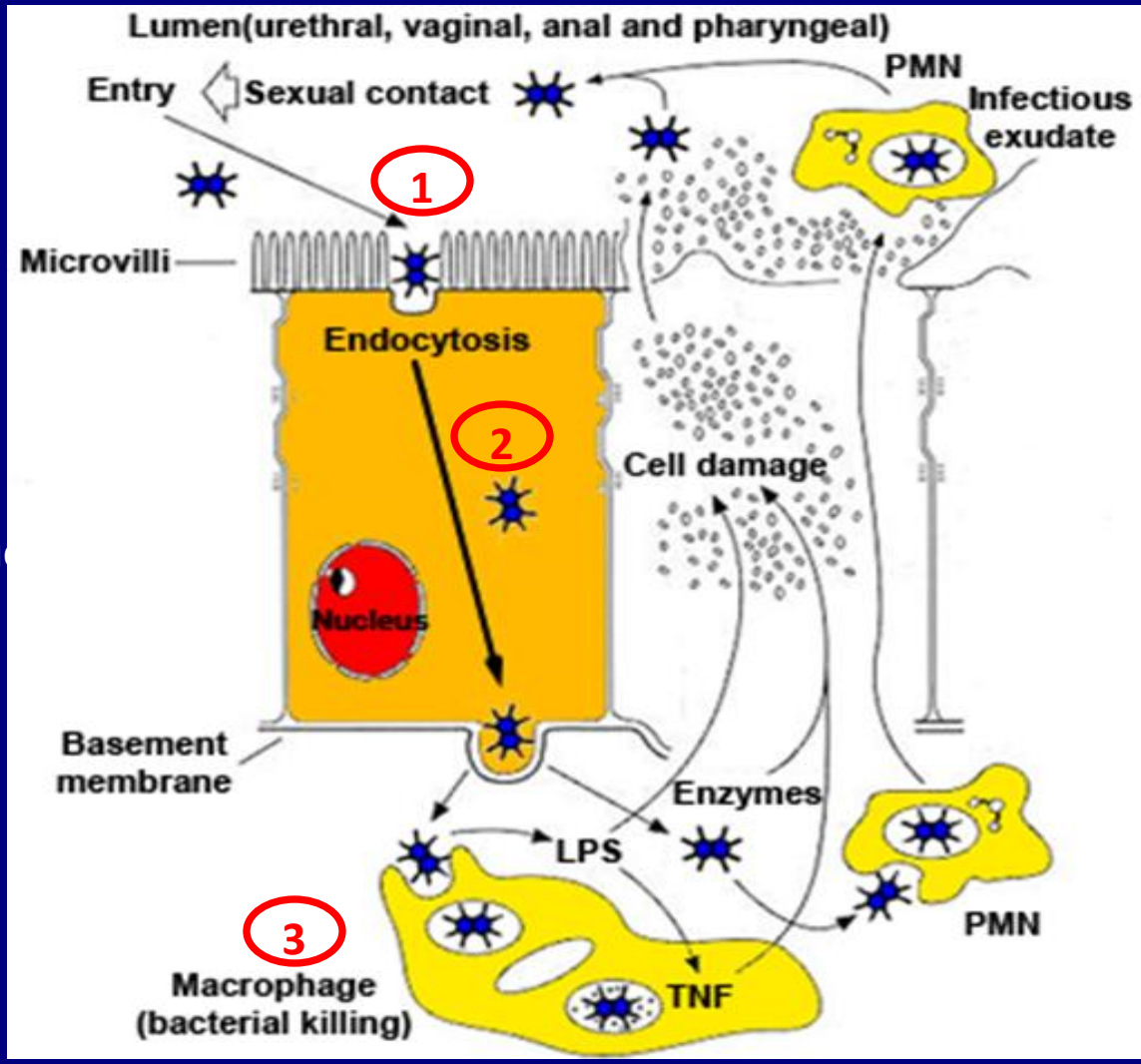
3. **Immune response with local tissu injury**

4. **Spread**

Local spread is to epididymis and fallopian tubes

5. **Dissemination**

In a small proportion of infections, organisms reach the Bloodstream to produce disseminated Gonococcal infection (DGI).



Gonorrhoeae

- Clinically
- Transmitted sexually amongst adults and can be transmitted to newborns during birth (PERINATAL)

- 95% of men are symptomatic and 40% of women are symptomatic.
- I.P 2-5 days

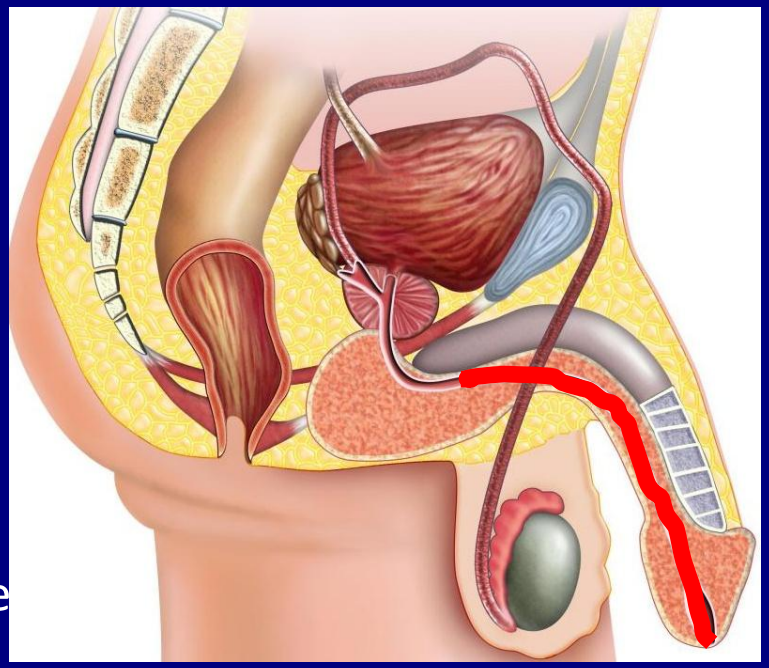
- **Males:**
- Urethritis
- Proctitis, epididymitis

Clinical manifestations

1. Genital Infection

In men:

a- Urethritis



- Urethra is the primary infection site
- 2-7 days incubation period
- Symptoms
  - frequency, urgency, dysuria
  - purulent spontaneous urethral discharge
  - blood in the semen or urine
- Asymptomatic in 10% of cases
- Male seeks treatment early preventing serious complications, but not soon enough to prevent transmission to other sex partners

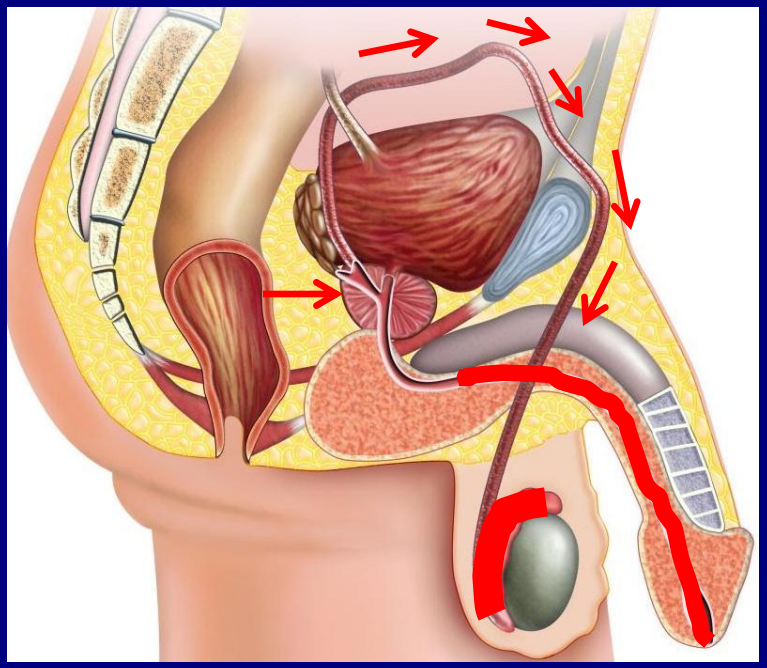
Clinical manifestations

1. Genital Infection

In men:

b. Epididymitis

- Signs and symptoms
  - testicular pain and swelling
  - abdominal or lower back pain
  - fever, nausea
  - discharge from the urethra
  - pain on urination, occasionally blood in the urine



Gonorrhoeae

- **Females:**

- Endocervical infection is the most common form of uncomplicated gonorrhoea in women.
- ➢ Such infections are usually characterized by vaginal discharge and sometimes by dysuria.

- The cervical os may be erythematous and friable, with a purulent exudate.
- In women, around half may have symptoms of discharge and dysuria.

Gonorrhoea

- Most females seek attention because of their partner's symptoms, or as part of contact tracing or screening of high-risk individuals.

- Local complications include abscesses in **Bartholin's** and Skene's glands

- Rectal infections (proctitis)

Gonorrhoeae

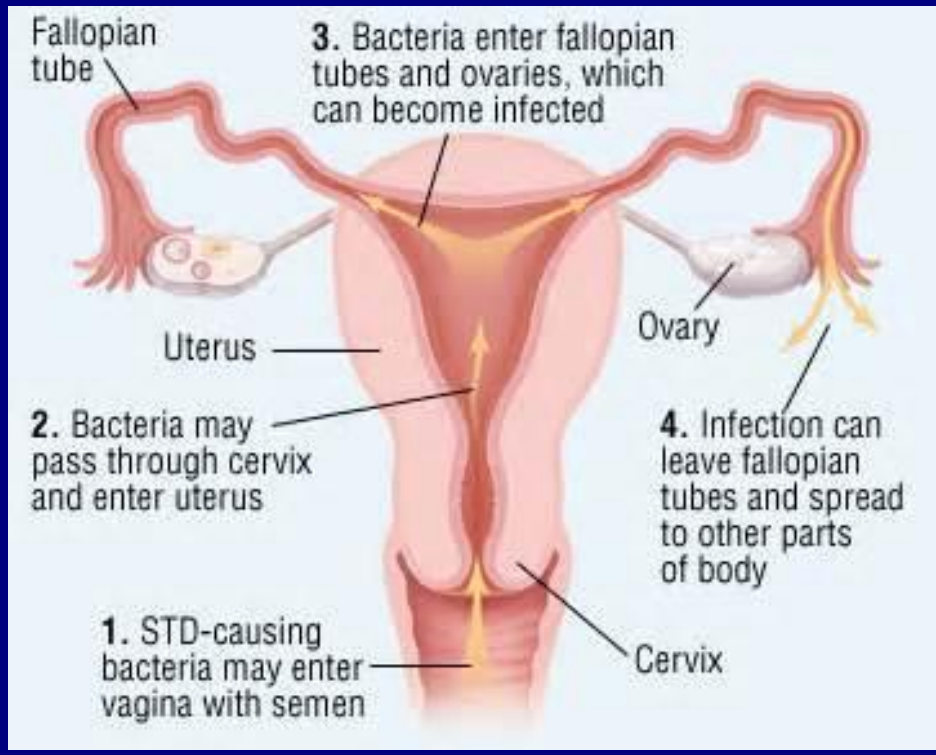
- Gonococci may ascend to the fallopian tubes to give rise to *acute salpingitis*, which may be followed by *pelvic inflammatory disease* and a high probability of sterility and ectopic pregnancy if treated inadequately (tubes scarring).

- Peritoneal spread occurs occasionally and may produce a perihepatic inflammation (*Fitz-Hugh-Curtis syndrome*).

Clinical manifestations

2. Pelvic Inflammatory Disease (PID)

- Is a term for inflammation of the uterus, fallopian tubes, and/or ovaries
- causes severe lower abdominal pain, especially during intercourse.
- PID infection itself may be cured but effects of the infection may be permanent (due to scarring inside the reproductive organs, which can later cause serious complications, including chronic pelvic pain, infertility, ectopic pregnancy)
- infection can spread to in the peritoneal cavity causing inflammation



Gonorrhoeae

- Disseminated infection:

- Seen more commonly in women, who may present with painful joints, fever and a few septic skin lesions on their extremities.

- Rarely, disseminated gonococcal infection may present as endocarditis or meningitis.

Gonorrhoeae – neonates

- Babies born to infected women may suffer *ophthalmia neonatorum:*

- A severe purulent eye discharge with peri-orbital oedema occurs within a few days of birth.
- If untreated, ophthalmia leads rapidly to blindness.
- It may be prevented in areas of high prevalence by the instillation of 1% aqueous silver nitrate in the eyes of newborn babies.
- Alternatively, topical erythromycin can be used; this has the advantage of being active against chlamydia and less toxic

Gonorrhoeae

Diagnosis:

- Samples include Exudates (go in 2cm by a swab into urethra), urine, cervical o r throat swabs.
- *N. gonorrhoeae* is intolerant of drying and temperature changes; it readily undergoes autolysis.

- Where there is likely to be any delay, transport media must be used to carry the material on swabs.

1. **Gram stain**: gram negative intracellular (within neutrophils) organism sensitivity 70-95 %

➢ it should not be used as the sole source for diagnosis when the findings are unexpected or have social (divorce) or legal (rape, child abuse) implications.

Gonorrhoeae

2. Culture:

- Thayer-Martin medium or chocolate agar.

- The gonococcus is a fastidious microbe, requiring humidity, 5-7% carbon dioxide and complex media for growth.

- The combination of oxidase-positive colonies and Gram-negative diplococci provides a presumptive diagnosis.

Gonorrhoeae

3. Serotypes: Pili

4. Auxotypes: Arginine, Uracil and Hypoxanthine requirements for growth

5. DNA typing

Gonorrhoeae

- Treatment :

- Treat both sides of the relation and contacts

- Strains of *N. gonorrhoeae* that are completely resistant to penicillins are now common throughout the world, although the prevalence varies from country to country.

- These strains possess the gene coding for the TEM-type β-lactamase commonly found in *Escherichia coli*.

Gonorrhoeae

- Ceftriaxone or cefixime are recommended as first-line therapy, but these drugs are expensive and may not be affordable in developing countries.

- Alternatives to cephalosporins and penicillin include fluoroquinolones (e.g. ciprofloxacin), azithromycin, tetracyclines, co-amoxiclav

- Single-dose therapy appears adequate for uncomplicated cases of acute genital gonorrhoea in men and women.

Gonorrhoeae

- SINGLE DOSE OF Ceftriaone + Doxycycline or azithromycin to cover for Chlamydia

- In disseminated gonococcal disease and any complicated infection, treatment for 7-10 days is necessary.

Gonorrhoeae

- Prevention:

- No vaccine / non-capsulated + antigenic variability
- Sexually transmitted: ABC
- Rapid diagnosis
- Use of effective antibiotics
- Tracing, examination and treatment of contacts

- Neonates: erythromycin or silver nitrates

The End