BHARATHIDASAN UNIVERSITY

Tiruchirappalli-620024
Tamil Nadu, India.

Programme: M.Sc., Biomedical Science

Course Title : Clinical Microbiology

Course Code: BM36C9

Unit-III

Neisseria

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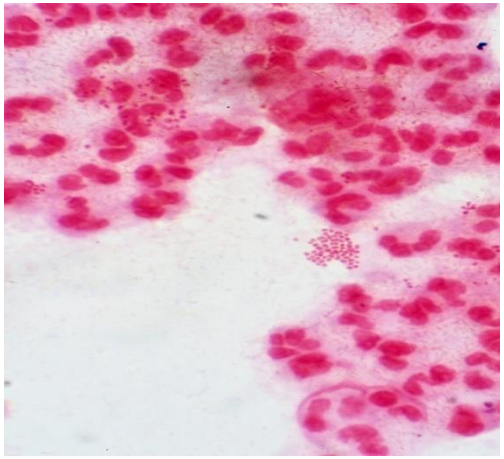
NEISSERIA

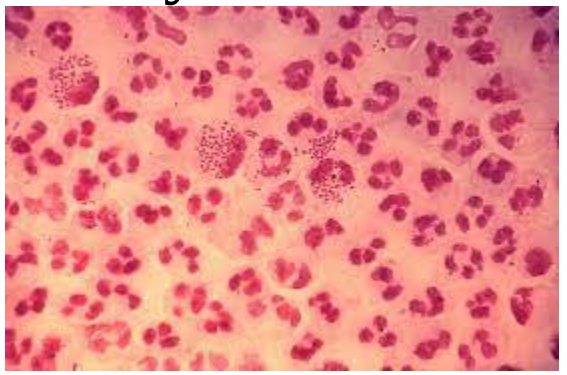


Introduction

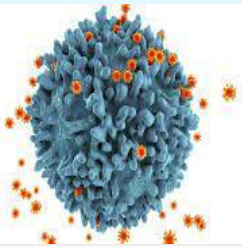
- ***Neisseria*** is a large genus of bacteria that colonize the mucosal surfaces of many animals.
- Of the 11 species that colonize humans, only two are pathogens, *N. meningitidis* and *N. gonorrhoeae*.

Neisseria Gonorrhea

- Causative agent – Neisseria gonorrhoeae (Gonococcus)
- **Albert Ludwig Sigesmund Neisser** in 1879 discovered the causative organism, Neisseria gonorrhoeae. His results were published in 1882.
- Gram negative diplococci. coffee-bean-shaped cocci and have a diameter of approximately 1lm

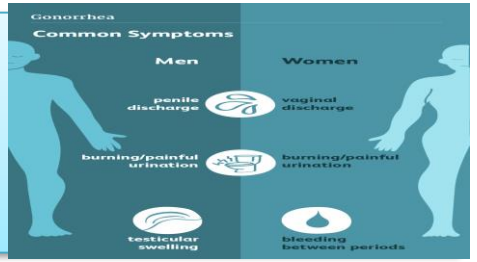


Pathogenesis



- Gonorrhea is a sexually transmitted disease.
- The pathogens penetrate into the urogenital mucosa, causing a local purulent infection. In men, the prostate and epididymis can also become infected.
- In women, the gonococci can also cause salpingitis, oophoritis, or even peritonitis infected.

Gonorrhoea Symptoms



- Burning sensation during urination.
- Discharge from the genitalia (Vaginal / penis).
- Testicular pain(male), pelvic pain (Female).
- Vaginal bleeding between periods.

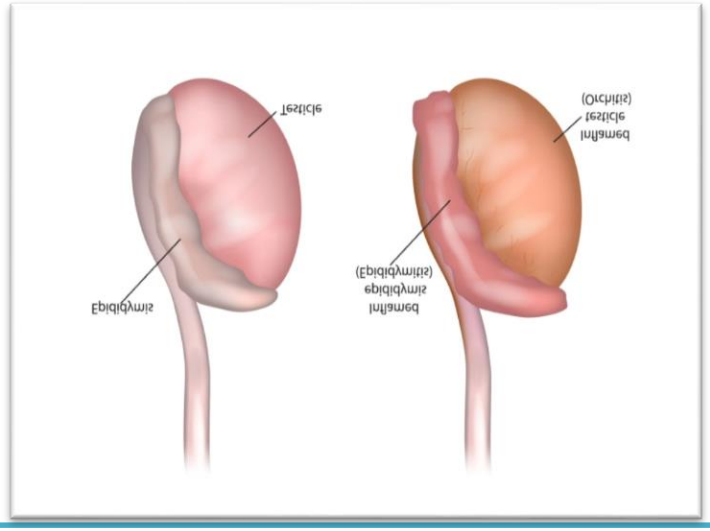
MALE

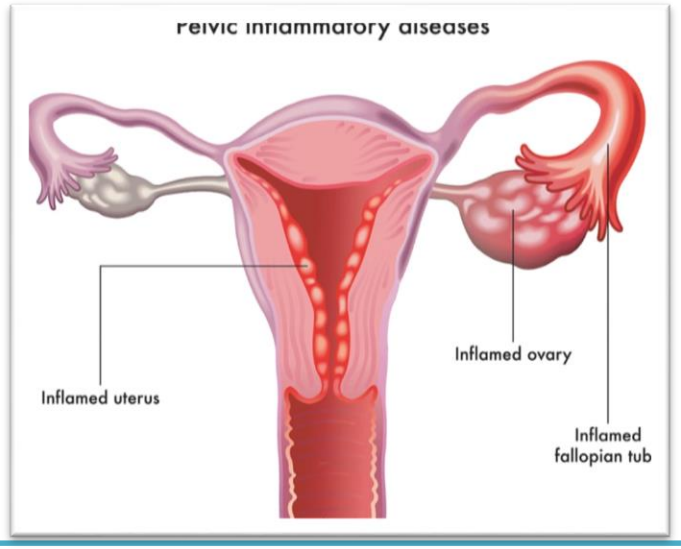
FEMALE

- Half of women with gonorrhea are asymptomatic.
- Other half experience vaginal discharge , lower abdominal pain and pain with sexual intercourse.
- **Complications;**

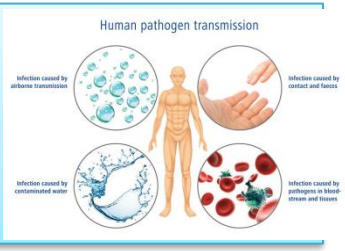
  Women – pelvic inflammatory disease(PID)

  Men – inflammation of the epididymis.
- If untreated it can spread to joints or heart valve.





Mode of transmission



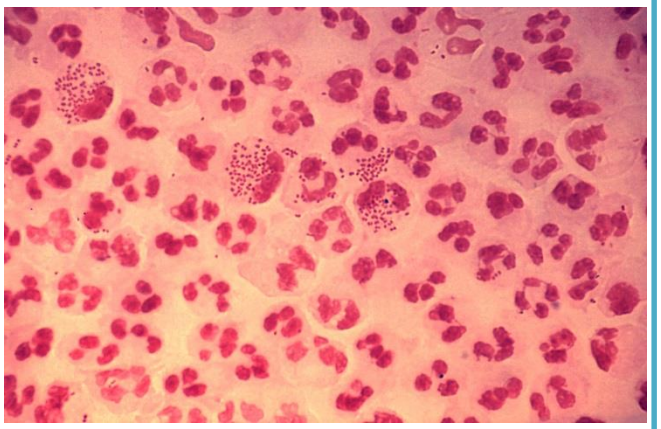
- Through sexual contact with an infected person.
- From mother to a child during birth(vertical transmission).
- Through objects contaminated with body fluid from an infected person.
- The bacteria does not survive long outside the body, typically dying within minutes to hours.
- Gonorrhea affects about 0.8% of women 0.6% of men.
- **Incubation period**: 2-5 Days.

Ophthalmia Neonatarum

- Gonococcal ophthalmia(Neonatal Conjunctivitis) will develop in 28% of infants born to women with gonorrhea, if not treated.
- Contracted during vaginal delivery from exposure to bacteria from birth canal.
- Erythromycin ointment applied to the newborn's eyes within 1hour of birth prevents gonococcal ophthalmia.
- If left untreated neonatal conjunctivitis can cause blindness.

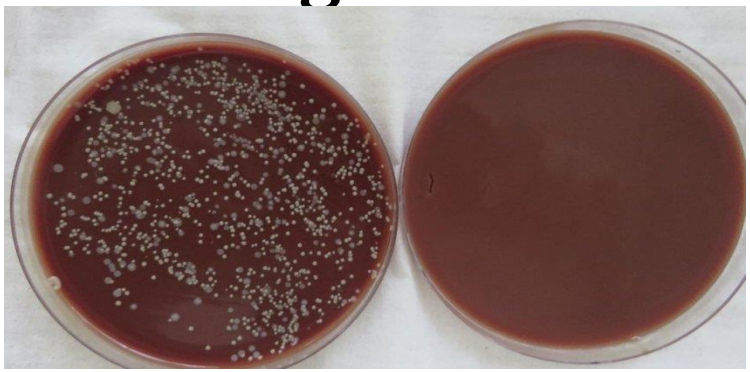
Diagnosis

- Grams staining (**pus , lesions, genital discharge**) – Gram negative diplococci.

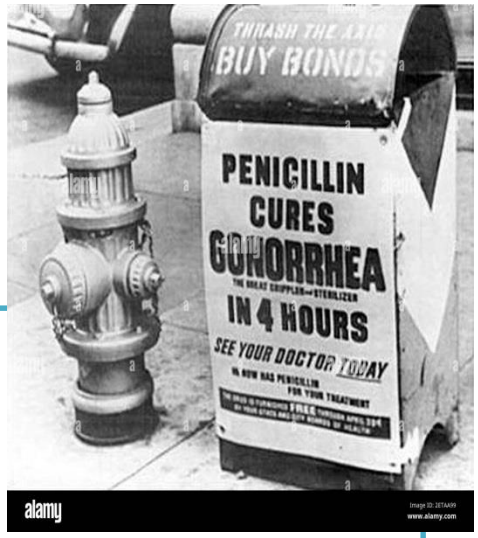


- Bacterial culture using

Thayer –martin agar.



Treatment



- Penicillin
- Ampicillin
- Tetracycline
- Cefixime + azithromycin (dual antibiotic therapy)
- **PREVENTION:**

Use condoms

Have safe sexual practices

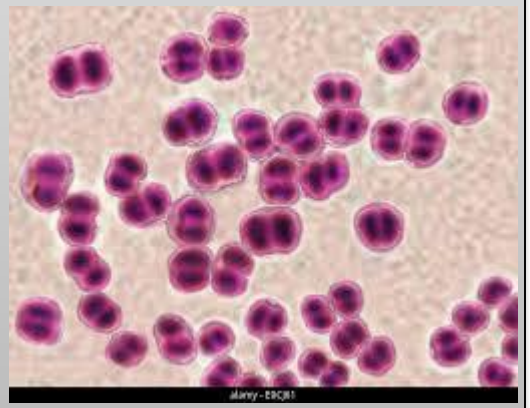
NEISSERIA MENINGITIDIS

- Meningococci are Gram-negative, coffee-bean shaped
- cocci that are frequently pleomorphic and have a diameter of 1 lm
- They are nonmotile and feature a polysaccharide capsule.
- Growing meningococci in cultures

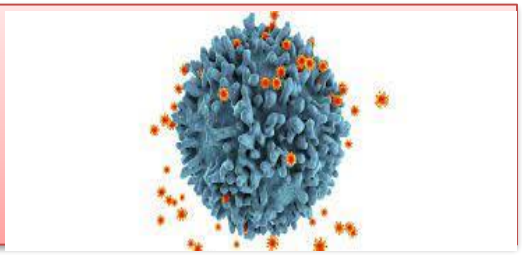
requires mediums containing blood.

- A concentration of 5–10% CO2

encourages proliferation.

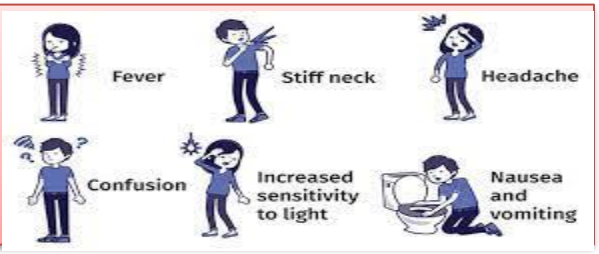


Pathogenesis



- Meningococci are parasites of the nasopharynx.
- These microorganisms are carried by 5–10% of the population.
- If virulent meningococci colonize the nasopharyngeal mucosa of a host lacking the antibodies, pathogen invasion of the mucosa by means of “parasite directed endocytosis” becomes possible

Symptoms



- Common symptoms of meningococcal meningitis include **sudden fever, headache, and stiff neck**.
- Other symptoms may include nausea, vomiting, increased sensitivity to light, and confusion

Diseases

- N. meningitidis is the most common cause of meningitidis in persons between the ages of 2 and 18 years.
- Outbreaks of meningitidis are most common in winter and early and favored by close contact between individuals Meningitis.
- Meningococcemia(multiplication of bacteria in the blood stream)

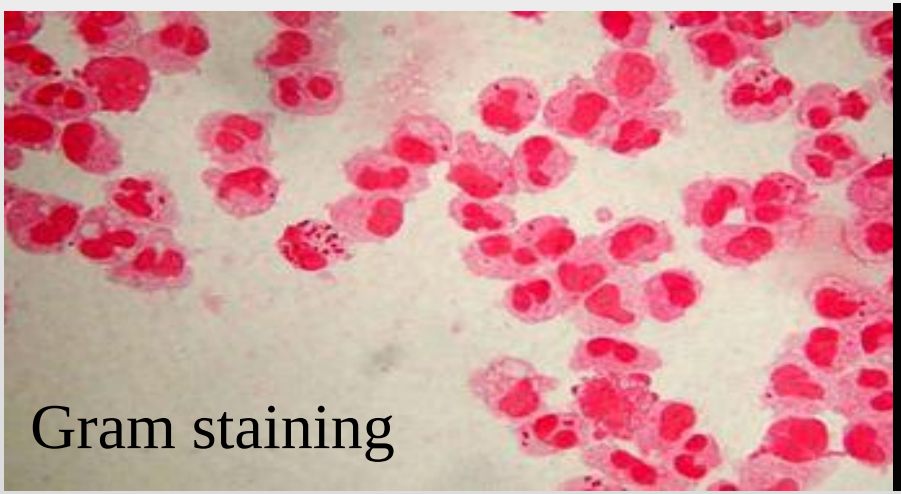
Diagnosis

- It is frequently isolated from samples such as blood, CSF.
- For success in culturing, the material must be used to inoculate blood agar without delay.
- **Methods**

  Gram staining

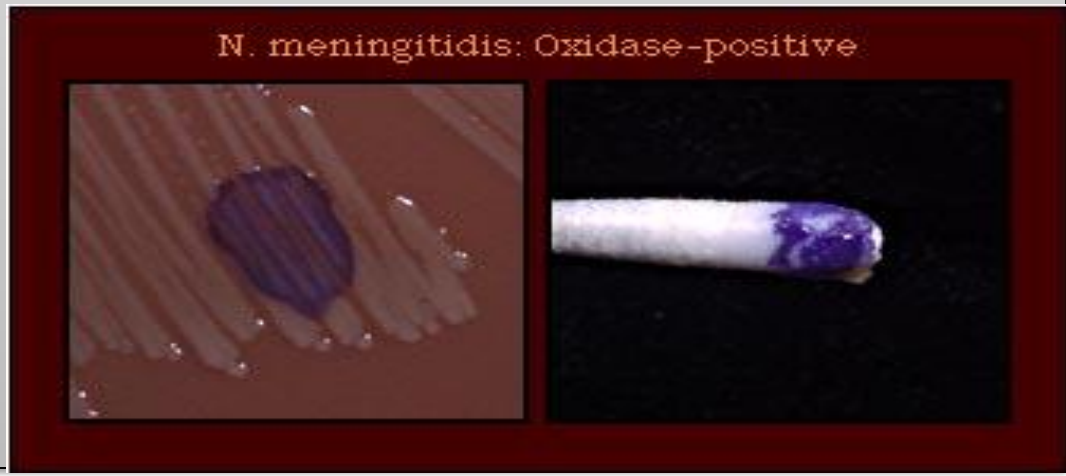
  Culture(blood agar or chocolate agar)

  Oxidase test.



- Oxidase test:

❖Determines the presence of cytochrome oxidase. It is positive In N. Meningitidis



Treatment and prevention

- Penicillin G or sulphonamides are the drugs of choice.
- Chloramphenicol or third generation cephalosporin such as cefotaxime or ceftriaxone are recommended for patients who are allergic to penicillin.
- Meningococcal vaccine is available which contains the capsular polysaccharide.

References

Adelberg. (2000). Review of Medical Microbiology. 19th edition. Lange Medical publications. U.S.A.

Ananthanarayan R. and C.K. Jeyaram Panikar. (1994). Text book of Microbiology. Orient Longman.


Thank You