

Neisseriaceae

General Facts:

- Neisseria and Moraxella are both gram negative **diplococci (bean shaped)** and are facultative anaerobes.
- Both are **oxidase and catalase positive**
- Highly susceptible to low/high temperature and they live at room temperature.
- They can be pathogenic (neisseria meningitides, neisseria gonorrhoea and Moraxella Catarrhalis) or nonpathogenic (N. sicca, N. flava, M. Mucosa – not important).
- Neisseria is invasive and multiplies intracellularly in WBC.

Neisseria Gonorrhoea:

- Virulence factors:
 1. Pili: for **attachment**
 2. IgA protease
 3. Lipopolysaccharide (endotoxin)
- These virulence factors help in:
 1. Colonization. (pili)
 2. Invasion and inflammation (endotoxin LPS)
- Gonorrhoea is an STD (sexually transmitted disease) that can colonize (and cause disease) in:
 1. Genitourinary tract
 2. Rectum
 3. Throat

*These infections can be either acute, subacute or even asymptomatic infection!
- Symptoms:

In men: **easily diagnosed** because most men are symptomatic and they show **dysuria** (pain during urination) and urethral discharge.

In women it's **more difficult to diagnose** because it doesn't affect the urethra and women with gonorrhoea are **usually asymptomatic**.

Symptomatic Women can show:

 - 1- Dysuria (not common)
 - 2- **Vaginal discharge.**
 - 3- **Cervicitis.**
 - 4- **Salpingitis: Also known as pelvic inflammatory disease (PID) which is a complication of this infection that can reach uterus, fallopian tubes, ovaries and even peritoneum!**
- Gonorrhoea never reaches the blood stream (**noninvasive**)
- Infected people don't become immunized after infection abates, so a **reinfection** is still a possibility.
- Lab: gonorrhoea as well as Neisseria meningitides both **replicated intracellularly in WBC's**. They can be detected by gram stain and biochemical tests (oxidase, catalase etc...)

- Culture in blood/chocolate agar. (*chocolate agar is basically heated blood agar that becomes brown in color*)
- Treat with antibiotics: *ceftriaxone* (remember: *third generation cephalosporin are used for gram negatives*).
- No vaccine compared to *Neisseria meningitidis*.

Neisseria meningitidis:

- The same virulence factors as *Gonorrhoea* with addition of the **capsular polysaccharide** (antiphagocytic)
- There are many serogroups of *Neisseria meningitidis*. **A, B and C** serotypes are invasive and can cause epidemics (*Neisseria meningitidis* is spread by respiratory droplets i.e sneezing, kissing coughing, exhaling etc...).
- Unlike *Gonorrhoea*, *Neisseria meningitidis* is **invasive**.
- Symptoms:
 - 1- *Neisseria meningitidis* starts as a sore throat.
 - 2- It might become invasive and reach blood stream (**sepsis = meningococemia**)
 - 3- If it reaches the CNS it cause **meningitis**.
 - 4- *Some people are only carriers (carried in nasopharynx) and can infect other people.*
- This disease has high mortality rate (50% if not treated) so treat it fast.
- This disease can cause epidemics (spread in community)
- Most infected are children between ages .5-5 years. Infants younger than 6 months are **protected by maternal antibodies**.
- Lab diagnoses: same as *Neisseria gonorrhoea*, but the culture is taken from **blood, throat or CSF**.
- *There is a vaccine.*

Moraxella Catarrhalis:

- It is one genera of the family *Neisseriaceae*.
- Part of the respiratory flora
- May cause **pneumonia in compromised lung** (i.e immunocompromised or heavy smokers)
- May cause **sepsis**.
- No vaccine.