**Chlamydia trachomatis**

Humans are natural host

Small, obligate intracellular parasites

Metabolically deficient, depend on host for ATP (energy)

In lab, can only be cultivated in cell culture

Inner and outer membranes, but no peptidoglycan layer

Stain weakly Gram negative → doesn't stain much at all

Related to: Chlamydia pneumoniae (TWAR agent) and C. psittaci

**Major outer membrane proteins (MOMPs) determine serovar:**

Serovars A, B, Ba, and C: associated with trachoma

Serovars D through K: associated with STD and neonatal conjunctivitis

Serovars L1, L2, and L3: associated with lymphogranuloma venereum (LGV) and hemorrhagic proctocolitis → has NODP

**LGV strains:**

very invasive

produce disease in lymphatic tissue

**non-LGV strains:**

produce superficial infections

generally involve only columnar epithelia of eye, genitalia and respiratory tract
Grow in the host cell inside a cytoplasmic vacuole ("chlamydial inclusion")

Unusual intracellular developmental cycle that takes 24-72 h.

Two forms of the bacteria:

**Elementary body (EB)**
- Small (0.3-0.4 μm)
- Metabolically inactive
- Extracellular survival
- Infectious form

"Mucoprotein": outer coat of extensively cross-linked outer membrane proteins (Cys-Cys disulfide bonds)

**Reticulate body (RB)**
- Larger (0.8-1 μm)
- Metabolically active
- Found only intracellularly
- Non-infectious form → no surface pili, ox for invasion.

**Growth cycle**
1) Adhesion of EB to cell
2) Phagocytosis → no fusion with lysosome
3) Differentiates into RBs
4) Repl. by binary fission & prod inclusion
5) Conversion to EB
6) Release of EB

* EB intracellular, resistant to many able.
Clinical Manifestations

Clinical manifestations due to tissue destruction and host inflammatory response

Generally infects epithelial cells found on mucous membranes of urethra, endocervix, endometrium, fallopian tubes, anorectum, respiratory tract, conjunctivae, but not in vagina (cervix & higher)

No long-lasting protective immunity!
Reinfection induces strong inflammatory response, resulting in increased tissue damage. Repeat infection get worse, esp w/ scarring, etc.

Symptoms of chlamydia are very similar to those of gonorrhea → but Tx is different.

You must confirm diagnosis

Also, consider possible co-infections with other STDs → makes sx to worser
especially gonorrhea

STD in Males
Less than 75% are symptomatic

Urethritis
Nonpurulent urethral discharge → clear, not mucous
Major cause of "nongonococcal urethritis" (NGU) → painful urination that isn’t gonorrhea
White-gray urethral discharge

Dysuria

Epididymitis

Proctitis

STD in Females
Most women are symptomatic, although careful examination may reveal evidence in 30 to 50% → still miss ½!

Pelvic Inflammatory Disease (Salpingitis) → infertility, b/e damage to uterus, fallopian tubes etc (scarring)

Urethritis
Most common pathogen isolated from college-aged women with dysuria and pyuria
**Conjunctivitis in Neonates**

Transmitted from infected mother during passage through birth canal (as with gonorrhea)

Inclusion conjunctivitis (5-12 days post-partum)
- Swollen eyelids, hyperemia, copious purulent discharge
- If untreated, can persist for up to a year: conjunctival scarring & corneal vascularization

Pneumonia (2-3 weeks post-partum):
- Rhinitis, distinctive staccato cough
- Afebrile throughout clinical disease
- Lasts for several weeks if untreated

**Lymphogranuloma Venereum (LGV)** → very invasive
- Place of inoculation is place of infxn
  - Will get small lesion, then later, lymph nodes go crazy.

Caused by serotypes L₁, L₂, and L₃
- Sexually transmitted

In heterosexual men,
- Primary genital lesion followed by multilocular suppurative lymphadenopathy

In women and (primarily) homosexual men,
- Hemorrhagic proctitis with regional lymphadenitis → have to look everywhere

**Trachoma**

Caused by serotypes A, B, Ba, and C

Repeated infections lead to scarring of cornea → infxn is on eyelid, but rubbing causes scarring

Leading cause of preventable blindness, mainly in developing world

Spread by flies and by hand-to-eye contact
- Easy reinfection: main intervention by improving sanitary conditions
Diagnosis

Gram stain of specimen: Better: Gram stain urethral or cervical swab, conjunctival scraping (needs to contain infected epithelial cells!)

Culture: Need to get inside cells. Most specific, will infect restricted range of cell lines in vitro

PCR of urine look for lact. shedding, but PCR is not specific & makes mistakes

ELISA

Treatment

Tetracycline, erythromycin

Newer agents:

Azithromycin: single dose: no compliance problems, fewer adverse reactions, more expensive

Ofloxacin: also covers Neisseria gonorrhoeae

Important to treat sexual partners

Gonorrheal infections should also be treated with agents to cover C. trachomatis since the two infections frequently coexist (approx. 50% of cases)

No vaccine → No prevention