GONORRHEA

What agent causes gonorrhea? How has its treatment changed? Why is prompt treatment of gonorrhea important?

*Neisseria gonorrhoeae* is the etiologic agent that causes gonorrhea.

The first effective antimicrobial therapy was introduced in the 1930's. In 1976, penicillin-resistant strains changed treatment guidelines.

New tests and treatments continue to evolve.

If treated promptly, 80-90 percent of gonococcal infections remain uncomplicated and localized at the site of initial inoculation.

Complications and dissemination to other parts of the body may develop without prompt treatment.

What are the characteristics of *Neisseria gonorrhoeae*? Where does it grow?

*N. gonorrhoeae*:
- Is a bean-shaped, gram-negative diplococci (growing in pairs).
- Grows best in warm, moist conditions, as do all microbes.
- Grows on or in columnar epithelial cells which form the surface layer of mucosa in the urethra, cervix, and rectum.

How is gonorrhea transmitted? What factors affect the rate of transmission?

Gonorrhea is transmitted through oral, anal, or vaginal sex by direct contact with infected mucosal surfaces.

Mother-to-baby infection occurs because of exposure to infection in the cervix.

In some cases, auto-inoculation occurs from a genital site to another site.

Transmission rates vary depending on the infected anatomic site, the type of sex, and the number of exposures. The rate of transmission is higher from male to female.

Most females and some males are asymptomatic.
What is the course of disease in males? What are signs, symptoms, and possible complications?

The primary site of infection in heterosexual males is the urethra. The pharynx and rectum are also commonly infected in MSM.

The incubation period ranges from one to over 14 days (average two to five days).

A majority of men will develop symptoms within 2-5 days, although many men never develop symptoms. Symptoms include a mucopurulent discharge and/or dysuria (painful urination).

In untreated gonorrhea, complications arise from the spread of the infection to the Cowper’s glands, prostate, and epididymis, causing inflammation and pain and possible scarring to cause urethral strictures and possibly infertility.

How is gonorrhea diagnosed in males?

First, urethral secretions should be collected for a Gram stained smear. However, this test is negative for many men with asymptomatic gonorrhea. If gram-negative intracellular diplococci cannot be identified on the smear, a culture or non-culture test such as NAAT should be conducted on urethral samples.

When antibiotic resistance is suspected, a culture is necessary.

In legal cases for both men and women, cultures or FDA-cleared NAATs for *N. gonorrhoeae* should be used to test for infection.

What is the course of disease in females? What are signs, symptoms and possible complications?

The endocervical canal is the primary site of infection. Due to auto-inoculation, secondary sites of infection may occur in the urethra or anorectal canal.

Most infected women are asymptomatic. The most common symptoms are vaginal discharge, dysuria, and intermenstrual vaginal bleeding. Clinical examination may reveal abnormalities of the cervix.

The most common complication is Pelvic Inflammatory Disease (PID) which can lead to infertility, chronic pain, and ectopic pregnancy. Bartholin’s gland abscess is the second most common complication.

How is gonorrhea diagnosed in women?

Culture or Nucleic Acid Amplification Test (NAAT) is recommended on endocervical secretions. Culture of the anorectum is often routinely performed as well.

Gram stain smears are not sensitive or specific enough to be recommended.
What are considerations for anorectal infection and pharyngeal gonorrhea?

Anorectal infections are usually asymptomatic, but symptoms may be severe.

Pharyngeal infections are usually asymptomatic, but a mild sore throat may occur. Pharyngeal infection may disseminate to organs and joints in rare instances. It is thought to be non-communicable.

Diagnosis is most often made by culture. NAATs are not FDA-approved; however, labs may obtain waivers.

In Disseminated Gonococcal Infection (DGI), what is the incidence and course of disease?

DGI is a serious complication that occurs when gonococcal infections move from the initial site into the blood stream and disseminate throughout the body.

About 1% of patients develop DGI which is often asymptomatic. It is more common in women.

Arthritis-dermatitis syndrome occurs in two stages. First, the bacteremic stage is characterized by chills, fever, malaise, joint aches, and skin rash. In the second stage, polyarticular arthritis causes joint pain in the knees, ankles, wrists or hands.

Bacteremia can also affect organs such as the heart and brain.

How is DGI diagnosed?

Diagnosis is made by culturing the blood or synovial fluid of the joints, or by a Gram stain of the synovial fluid or exudate of pustular skin lesions.

A diagnosis must be made from the clinical picture, finding organisms on smear or culture from skin lesions; synovial fluid from arthritic joints; original oral or anogenital sites of infection; or from the sex partner.

Pharyngeal and anogenital cultures should be performed on all suspected DGI cases.

What are the consequences of untreated gonorrhea?

Severe urogenital, pharyngeal, and rectal infections occur in men and women.

Conjunctivitis can affect adults and neonates.

Pelvic inflammatory disease (PID) can cause tubal infertility, ectopic pregnancy, and chronic pelvic pain.

What are special considerations in the treatment of gonorrhea?

Special concerns include:

- Antibiotic resistant *N. gonorrhoeae*
- The high frequency of co-infection with chlamydial infections
- The serious complications of chlamydial and gonococcal infections.
- The CDC STD Treatment Guidelines provide the recommended treatment for uncomplicated gonococcal infection. Treatment regimens from particular STD program areas apply.
**What are special circumstances of gonorrhea for pregnancy, neonates, and children?**

Symptoms during pregnancy are the same as non pregnancy except PID is less common and pharyngeal infection is more common.

PID can cause premature delivery, spontaneous abortion, still birth, or a severely infected live infant.

Neonates born to women with untreated infection can be infected in the pharynx, vagina, or eye.

Silver nitrate drops or antimicrobial ointments are placed in the eyes of all neonates as a prophylaxis against gonococcal ophthalmia which can cause blindness.

Gonococcal ophthalmia is diagnosed with a Gram stained smear of the eye discharge.

Gonococcal infection is extremely rare in children of one month to ten years old. Sexual abuse should be suspected for STDs in this age group, requiring reporting and investigation in accordance with local policy.

**How is gonorrhea treated?**

At present, cephalosporins are the only recommended antimicrobials in the US for therapy of gonorrhea. Gonococci have become resistant to many antimicrobials such as penicillin, tetracycline, and fluoroquinolones.

The Gonococcal Isolate Surveillance Project (GISP) monitors resistant strains of *N. gonorrhoeae* in over 20 cities in the US.

**How do HIV and gonorrhea affect transmission?**

Gonorrhea increases susceptibility to HIV transmission through breaks in the protective mucosal surface and through an increase in the number of HIV target cells.

Persons co-infected with HIV and gonorrhea are more likely to transmit HIV to others because of an increase in the shedding of HIV in semen.

**In case management of gonorrhea, what is preventive treatment and what information should be discussed with patients?**

Local policy dictates partner services providers’ responsibility.

Preventive treatment requires identifying and treating persons in whom the disease may be developing (incubating).

Patients should:

- Understand how to take medications plus any major side effects.
- Know why and how to refer sex partners and social contacts for examination and treatment.
- Avoid sex until they and their partners are cured.
- Return early if symptoms persist or recur.
- Adopt a realistic risk-reduction plan to prevent future infection.
- Understand that consistent and correct use of condoms offers good protection against gonorrhea and many other STDs.