elementary body before attachment to susceptible epithelial cells and subsequent endocytosis. On entering the cell, the elementary form of *C. trachomatis* reorganizes into a reticulate body within vacuoles that is functionally active, leading to growth and replication of the organism.

Clinical Presentation

Chlamydia may manifest with signs and symptoms ranging from none to life-threatening PID in women. When individuals have symptoms, the most common is urethritis in men and cervicitis in women. The incubation period varies but is usually 7 to 14 days after exposure.

Among men, 40% to more than 90% of chlamydia cases may be asymptomatic. Urethritis usually manifests as dysuria or discharge. *C. trachomatis* and *N. gonorrhoeae* infections are common causes of epididymitis in younger men. The infection typically manifests with unilateral testicular pain, swelling, and tenderness. *C. trachomatis* infection may also cause prostatitis and proctitis; the latter is typically found in MSM. The rates of transmission from infected men to women are as high as 65%.

In women and men, more than 85% of infections are asymptomatic. When symptomatic, *C. trachomatis* infection in women can be difficult to diagnose due to the nonspecific nature of symptoms. The classic manifestation is cervicitis, which can cause discharge, bleeding, pelvic pain, cervical friability, and ulcers. Complications of chlamydia include chronic pelvic pain, infertility, ectopic pregnancy, and PID. The incidence of PID due to *C. trachomatis* infection depends on the population studied, but it ranges from 0% (in lower-risk populations) to 30%. PID usually manifests as abdominal or pelvic pain, cervical motion tenderness, and uterine or adnexal tenderness. Infection may also cause perihepatitis (i.e. Fitz-Hugh–Curtis syndrome), which is inflammation of the liver capsule. It occurs in 5% to 15% of PID cases. Chlamydia is the leading cause of preventable infertility worldwide.

Chlamydia may cause conjunctivitis and ocular trachomatis, the most common cause of preventable blindness worldwide. The disease also may manifest with pharyngitis and LGV. Classically a disease endemic in Africa, Southeast Asia, and the Caribbean, LGV has been identified in the United States and Europe, particularly among MSM with symptoms of proctitis. Typically, LGV manifests with genital ulceration and inguinal lymphadenopathy.

Diagnosis and Differential Diagnosis

C. trachomatis cannot be routinely cultured on growth media, which has made diagnosis difficult. The introduction of nucleic acid amplification testing (NAAT) was a major advance and is now the standard diagnostic test. NAAT encompasses several laboratory methods including polymerase chain reaction (PCR), transcription-mediated amplification, and strand displacement amplification. The reported sensitivity of NAAT is 80% to 90%, with a specificity of 99%. The test may be performed on urine and vaginal or urethral (men) endocervical swab specimens. NAAT may also be performed on rectal and pharyngeal swab specimens, but it must be validated before use.

Individuals who test positive and are treated for chlamydia should not be retested for at least 3 weeks after treatment. NAAT may remain positive during this time due to remnant material that does not signify persistent infection. Repeat testing to demonstrate cure should be performed for pregnant women or those with a concern about persistent infection. Individuals are usually retested every 3 months and at least once each year. Having had an STI places individuals at risk for becoming infected again. For individuals with multiple partners, including MSM, general STI testing that includes chlamydia is recommended every 3 to 6 months.

Treatment

Standard treatment regimens for urethritis or cervicitis due to chlamydia are azithromycin (1 g taken once orally) or doxycycline (100 mg twice daily for 7 days). These two medications are equally effective and cure more than 95% of infections. Azithromycin is the preferred agent due to simplicity of dosing, which facilitates adherence. Azithromycin can also be used in pregnancy. Other drugs that are effective in treating chlamydia include quinolones and penicillin. Sulfonamides (e.g., Bactrim) and cephalosporins should not be used. Doxycycline, ofloxacin, and levofloxacin are contraindicated in pregnant women.

Epididymitis due to chlamydia should be treated with doxycycline (100 mg taken orally twice per day for 10 days). Treatment for LGV proctitis depends on the severity of symptoms and should include doxycycline (100 mg orally twice each day for up to 3 weeks). In women, PID should be treated with ceftriaxone (250 mg given once intramuscularly) to cover gonorrhea and doxycycline (100 mg taken orally twice each day for 14 days) for chlamydia. Women who are pregnant or who have concerning symptoms should be hospitalized and started on intravenous antibiotics, including cefoxitin (2 g given intravenously every 6 hours) or cefotetan (2 g given intravenously every 12 hours) and doxycycline (100 mg taken orally every 12 hours). The duration depends on clinical improvement but is usually 2 weeks. Alternative treatment regimens include clindamycin (900 mg given intravenously every 8 hours) and gentamicin (2-mg/kg loading dose followed by 1.5 mg/kg every 8 hours).

Prognosis

The natural history of untreated *C. trachomatis* infection varies. Individuals may remain asymptomatic for long periods, and the infection may resolve spontaneously or progress to symptoms and complications. Approximately 20% of individuals diagnosed with chlamydia but without symptoms may clear the infection before returning for treatment. Infection does not translate to protective immunity, and reinfection is common (10% to 20%). In some regions, expedited partner therapy is allowed, and medical providers may prescribe treatment for sex partners without seeing them.

Gonorrhea

Definition and Epidemiology

Gonorrhea is caused by the bacterium *N. gonorrhoeae* and is the second most common reportable STI in the United States behind chlamydia. Similar to chlamydia, gonorrhea is a significant cause of urethritis in men and cervicitis in women and has the same