



Sexually Transmitted Infections

Philip A. Chan and Susan Cu-uvin

INTRODUCTION

Sexually transmitted infections (STIs) encompass a wide variety of organisms that have been causing human disease for thousands of years. Recognition of STIs can be challenging due to the heterogeneous nature and multiple symptoms of a single disease. Diagnosis and management of STIs is further complicated by underlying social bias and hesitancy by medical providers and patients to discuss issues related to sexuality and disease transmission.

The diagnosis of STIs should be based on a detailed history with special attention to sexual orientation and behaviors, a physical examination, and laboratory confirmation when appropriate. Professional and respectful attitudes by medical providers are essential to obtaining an accurate clinical history pertinent to STIs. Patients often deny risky behavior because of embarrassment or social stigma. Patients may also underestimate risky behaviors, and the diagnosis of STIs should therefore be based on a combination of history, clinical examination, and diagnostic testing.

A detailed sexual history should be obtained from all individuals with a suspected STI. They should be informed that the information is necessary to appropriately diagnose and manage STIs. The history should include the sexual preferences of male and female partners; the number of main, casual, and one-time partners; and the use of condoms, drugs, and alcohol. The history of partners should be elicited, including current symptoms and diagnosed STIs. If possible, counseling and education should be incorporated during the encounter. Prevention topics include abstinence, routine testing, disclosure of STIs to partners, behavior modification (i.e., avoiding risky sexual activities), condom use, and prophylactic treatment for exposures.

Because of the diverse nature of STIs, it is useful to categorize the infections in a few major groups. There is overlap between different categories, and clinical judgment must be used to accurately diagnose STIs. For example, STIs that typically manifest with an ulcer may occasionally manifest with urethritis. Many STIs are asymptomatic. When an individual has one STI, others should be considered. The main categories of STIs are urethritis and cervicitis, genital ulcer disease, and genital warts. Symptomatic individuals with an STI usually fit into one of these categories.

URETHRITIS AND CERVICITIS

Urethritis and cervicitis are characterized by dysuria, burning, and urethral discharge. The discharge may range from barely

noticeable to watery to frank pus. Urethritis has been categorized as gonococcal (i.e., caused by *Neisseria gonorrhoeae* and visible on Gram stain) or nongonococcal (i.e., commonly caused by *Chlamydia trachomatis*). Nongonococcal urethritis can be caused by other organisms, many of which are rarely tested for. Urethritis has historically been classified as gonococcal or nongonococcal because *N. gonorrhoeae* can easily be visualized on Gram stain. Most patients with symptomatic urethritis should be treated empirically with antibiotics directed against gonorrheal and chlamydial organisms without waiting for test results.

Chlamydia

Definition and Epidemiology

Chlamydia is the most prevalent bacterial STI in the United States and the world. The infection is caused by the bacterium *C. trachomatis*, which causes 30% to 40% of nongonococcal urethritis and cervicitis cases. In the United States, approximately 1.4 million cases were reported to the Centers for Disease Control and Prevention (CDC) in 2011, with an estimated number of infections that is more than twice the number of reported cases.

Age is a factor. Chlamydia has a 5% to 10% prevalence among adolescents and young adults. Other risk factors include having multiple sex partners, having unprotected sex, or living in a lower socioeconomic area. In men, chlamydia is rarely associated with complications. In women, untreated chlamydia is associated with potentially severe complications, including pelvic inflammatory disease (PID), ectopic pregnancy, and infertility.

The CDC recommends all sexually active women age 25 years or younger and other at-risk women be screened for chlamydia. Screening should also be considered for individuals who have a history of chlamydia or other STIs, have new or multiple sex partners, or exchange sex for drugs or money. All pregnant women should be screened. Men who have sex with men (MSM) should be screened at least annually and more frequently if there are ongoing risk factors such as multiple partners. The rationale for screening men is to prevent symptomatic epididymitis, proctitis, and urethritis.

Pathology

C. trachomatis is an obligate intracellular, gram-negative bacterium that is evolutionary distinct from other bacteria. Several serovars of *C. trachomatis* are associated with human disease. They include serovars A-C (i.e., trachoma or ocular disease), D-K (i.e., anogenital disease), and L1-L3 (i.e., lymphogranuloma venereum [LGV]). *C. trachomatis* exists as an extracellular