

Sexually Transmitted Infections



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KEYWORDS

• STI • Syphilis • Gonorrhea • Chlamydia • HSV • HPV

KEY POINTS

- Sexually transmitted infections (STIs) continue to be a significant cause of morbidity and public health risk.
- Since 2011 the incidence of primary and secondary syphilis is increasing, particularly in men who have sex with men (MSM).
- Gonorrhea and chlamydia remain the main causes of bacterial urethritis and cervicitis.
- Human papillomavirus (HPV) can cause benign and malignant lesions and remains difficult to treat but can be prevented with vaccination.
- Primary prevention, behavior modification counseling, partner notification, and early treatment continue to be the mainstays in preventing the spread of STIs.

INTRODUCTION

STIs encompass a group of infections that can be spread or acquired through sexual contact. The Centers for Disease Control and Prevention (CDC) estimates approximately 20 million new STIs per year in the United States at a cost of approximately \$16 billion.¹ Half of these infections are in people between the ages of 15 and 24 years old. Each infection has the potential to pose significant immediate and long-term harm, affecting health and well-being. Primary prevention of STIs, through safe sex practices and partner awareness, can help decrease the incidence of many STIs. By far the most important tool to assist in the control of STIs is early diagnosis and treatment of these infected. This is evident in the decreased incidence in syphilis and gonorrhea seen from the 1980s to the early 2000s.^{2,3} The most recent surveillance updates by the CDC have identified an overall decrease in the rates of Chlamydia and gonorrhea in the general population. In 2013 there were 1,401,906 cases of

Chlamydia trachomatis infection in the United States, representing an infection rate of 446.6 cases per 100,000 population. This represented a decrease of 1.5% compared with the rate in 2012. In women, gonorrhea infection has also decreased by 5%; however, an increase of 4% was seen in men. In 2010 the rates of primary and secondary syphilis experienced their first decline in 10 years; however, from 2011 to 2013 the rates have increased by more than 20%.¹

Individuals at the highest risk for contracting an STI are sexually active young adults between the ages of 18 and 25. Other important risk factors are the number of sexual partners, new sex partners, use of illicit drugs, admission to a correctional facility, and a prior history of STI.³ A newly described risk factor for STI is the use of erectile dysfunction medications in older men. A review of men prescribed ED medication found a 2- to 3-fold increase in the rate of STIs in men taking erectile dysfunction medications compared with men not taking these medications.⁴ Recent travel is also an important risk factor for the acquisition

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of STIs and has been seen in approximately 2.9% of illnesses in returning travelers.⁵

Primary prevention of STIs begins with recognizing the risk behaviors of individual patients and counseling on changing these behaviors to prevent the acquisition of STIs. The US Preventive Services Task Force (USPSTF) recommends high-intensity behavioral counseling for all sexually active adolescents and adults.^{6,7} This involves routinely obtaining a sexual history on all patients and a discussion of behavior modifications and changes to at-risk practices. These counseling interventions have demonstrated efficacy in reducing acquisition rates of syphilis, Chlamydia, gonorrhea, and trichomoniasis.^{3,8} The CDC also promotes obtaining a sexual history focusing on the 5Ps: Partner(s), Prevention of pregnancy, Protection from STIs, sexual Practices, and Past history of STIs. These questions can lead to conversations about primary and secondary prevention. Prevention counseling should be provided in a safe, nonjudgmental, and empathetic environment.³

This review focuses on the common causes of STIs. The focus is on the causes of ulcerative and nonulcerative diseases, condyloma, and a discussion on partner notification and treatment.

INFECTIONS THAT CAUSE ULCERS

Syphilis

The incidence of syphilis in the United States peaked in the 1940s, with an incidence of 66.9 cases per 100,000 persons (**Table 1**). Aggressive public health interventions, including treatment with penicillin and contact tracing, led to a significant decrease in the incidence of primary and secondary syphilis. By the late 1990s, there was a significant decline in the incidence of syphilis, with a rate of 2.1 cases per 100,000 persons. Since 2011 there has been a steady increase in the incidence of syphilis, and in 2014 there was a rate of 5.5 cases per 100,000 persons. Approximately 75% of all primary and secondary syphilis cases have been diagnosed in MSM.¹

Clinical presentation

Syphilis is caused by the spirochete, *Treponema pallidum pallidum*. Transmission occurs through contact with active lesions, infected body fluids, or blood transfusion or can be acquired in utero.

Once infection is established, there is rapid systemic dissemination, including to the central nervous system. The incubation period is approximately 21 days, at which time a single, painless chancre develops at the site of inoculation. These lesions often are unnoticed, particularly in women and MSM who are practicing receptive anal

intercourse, where the lesions are in locations that are difficult to visualize. The lesion, which may be accompanied by regional lymphadenopathy, fever, or malaise, is often self-limited and resolves within a few days to weeks (3–90 days). Untreated, the infection may progress to a secondary and tertiary phase.³

Secondary syphilis presents as skin and mucous membrane lesions or rash, approximately 4 to 10 weeks after inoculation. The rash is macular and nonpruritic and may be associated with regional lymphadenopathy or systemic symptoms. Lesions are typically 5 to 10 mm and red in color and as they progress may become papular or papulosquamous (**Fig. 1**). Approximately 50% to 80% of cases have the rash on the palms and soles.³ Like the primary chancre, the rash resolves with or without treatment and the infection enters a latent phase.

Latency is divided into early (infection acquired within the previous year) or late (infection acquired >1 y or unknown duration) phases. During this latent stage, most persons are not infectious, the major exception pregnant women who can pass the infection vertically to their fetus. Most patients with latent syphilis stay in this stage indefinitely; however, up to 25% of patients with untreated syphilis go on to develop tertiary manifestations.⁹

The primary manifestations of tertiary syphilis include cardiovascular disease, gummatous disease, and/or neurologic manifestations. Cardiovascular complications can present 10 to 30 years after infection and can lead to aortitis, angina from coronary ostitis, aortic regurgitation, or aortic aneurysm. Gummas can present in any organ and lead to serious complications depending on the organ involved, the most severe being the central and peripheral nervous systems.^{3,9}

Neurosyphilis can occur at any stage of infection, including primary infection. Early neurosyphilis is characterized by meningovascular disease, including meningitis, strokes, seizures, myelopathy, cranial nerve palsy, and vestibular and ocular disease (retinitis). Late neurosyphilis affects the brain and spinal cord parenchyma, presenting as dementia, tabes dorsalis, general paresis, or sensory ataxia.⁹

Diagnostic testing

When a diagnosis of syphilis is suspected, a detailed sexual history and physical examination are necessary. Physical examination should focus on dermatologic, neurologic, ocular, auditory, and vestibular manifestations of syphilis. Diagnosis can be made using dark-field microscopy of a scraping of the ulcer or rash. This testing modality

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