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An Overview of Syphilis

Ranjana Kumari
Msc Microbiology, Shoolini institute of life sciences and business management Anand campus, The Mall Solan (H.P) 173212.
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Introduction

Syphilis is a sexually transmitted infection caused by a spirochaete Bacteria *Treponema pallidum* subsp. *pallidum*. The only known natural host of the bacterium is the human. It is highly contagious disease usually transmitted through sexual activity (venereal) including oral and anal sex, and can also be transmitted by other mean (non-venereal) such as contaminated needles exposed to injected blood, from infected mother to child across the placenta. syphilis is passed from person to person through direct contact with a syphilis sore. Infection is initiated when the organism penetrates the dermal micro abrasions or intact mucus membranes of a person. Treponema pallidum penetrates a broad variety of tissues, including central nervous system, eye and placenta.

The epidemic of the disease 1st recorded in Europe in 1495. It is spread widely throughout Europe in virulent form called pox and then on to India, China and Japan. At least three hypotheses about the origin of syphilis in Europe were advanced. Most popular and best supported by historical, archaeological studies is so called Columbian hypothesis which suggests that the disease is spread from Africa through Asia and entering North America. The presence of skeletal evidence of syphilis at the site of the Columbus's landing suggests that the Columbus soldiers got infected there and then transmitted the disease to the Europe when they returned in 1492.

The name "syphilis" is coined by the sixteenth century poet and Italian physician Girolamo Fracastoro of Verona in his epic noted poem written in Latin, titled Syphilis Sive Morbus Gallicus in 1530. The protagonist of the poem is a shepherd named Syphilus who is presented as the first man to contract the disease.

Etiology: *Treponema pallidum* subsp. *pallidum*

Gram negative motile, thin, spiral (6-12 regular spirals) or coil shaped spirochaetal bacterium (0.2µm in diameter and between 6-15µm in length).

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The Helical structure of the bacterium allow it to move in a corkscrew motion through viscous medium such as mucus. The causative agent of syphilis was first demonstration under magnification in Barlin on March 3, 1905 by schauddin and Hoffman in the chancres and inguinal lymph nodes of syphilitic patient.

Pathogenesis

Syphilis is starts with the formation of small lesion called chancre. which is present at the site of entry of the Spirochetes. Spirochete enters through the micro abrasion or mucosa of genitalia. When the syphilis is acquired through sexual activity (Venereal) most of the chancres are on the genitals, but may also develop in or on the mouth or on the breast. But when the syphilis is acquired non venereal (as occupationally in doctors or nurses), the primary chancre is extragenital, usually on the fingers.

Usual locations of the chancre

In Women	**In Man**
On the vulva (outside the vagina) On the cervix (neck of the wombs)	On the penis, around the anus and mouth.
In Both sexes The eye may be affected this may be seen as swelling in the blood vessel nervous or any part of eye. On genitals mouth breast and on rectal are common in male homosexuals. Multiple chancres may be seen in HIV infected or immunocompromise persons. In the rare instances where syphilis is transmitted by blood transfusion the primary chance does not occurs.	

Mode of Transmission: syphilis is transmitted by following routes:

- Through sexual intercourse: Anal, vaginal, or oral.
- From infected mother to foetus through the placenta at any time during pregnancy or through the Child's contact with syphilitic ulcers during the birth process.
- Through contaminated needles.
- Through needle sharing by drug addict and also through kissing.
- Transmission by blood transfusion is possible but rare because blood products one screened for the disease and spirochetes also die within 24 hours in stored blood.
- It is not transmitted by food, water, air, by sharing baths, toilets, towel or eating utensils because *Treponema* is delicate, fastidious, fragile and very sensitive to environmental factor and dies rapidly in water.

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Stages of syphilis:

Primary Stage

Primary stage of syphilis is the entry of the organism into the body. This is an asymptomatic period and first signs of infection are not always notice.

Incubation period: 10 to 90 days.

- After an incubation of 10 to 90 days the patient develops a primary syphilis.
- A small blister like hard sore (chancre) about 0.5 in (13mm) size, appear on genitals, anus or elsewhere.
- The chancre is round, painless, avascular and indurate.
- The chancre can remain unnoticed by up to 50% of patients and will heal in 3-10 days.
- Progresses to the second stage if untreated.

Secondary stage: Secondary stage of syphilis is sets in six to eight weeks to six months after the healing of primary chancre.

- Chancre heals spontaneously without leaving a conspicuous scar.
- During this interval patient is asymptomatic.
- Secondary syphilis is a systematic infection due to the wide spread multiplication of the spirochetes and their dissemination through the blood.

Clinical Features

- **Skin rashes:** Red pumpy skin rashes appear on arms, leg chest face or other area. Later reddish brown raised rash is seen on palms, hands and soles of the feet.
- **Skin lesion:** large raised white or gray lesion appear in warm moist area of the body including perineum, anus, at the site of the chancre.
- **Oral lesion:** Shallow irregular sore with greyish white covering found in the mouth (mucous plaques).

  Symptoms will go away without treatment.

  Latent stage: Absence of external symptoms. The latent phase is sometimes divided into two:
- **Early latent syphilis:** less than two years after infection.

  During this period symptoms of secondary syphilis can return.

  Transmittable sexually or from mother to child, resulting in congenital syphilis.
- **Late Latent syphilis:** Asymptomatic infection of longer than one year or of unknown duration.

Tertiary stage

Untreated individuals with latent syphilis infection developed tertiary syphilis.

Without treatment, the tertiary phase of syphilis may lead to several complications. At this stage, syphilis can affect multiple organs and systems, including brain, nerves, eyes, liver, heart, blood

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vessels, bones and joints. Tertiary syphilis can also cause death.

Neurosyphilis, ocular syphilis and otosyphilis can occur at any stage of the disease.

Neurosyphilis

About 8% of patients will develops symptoms in the central nervous system. It is mainly involving the brain or spinal cord. It is more common in HIV patients can cause strong headache, serious muscular problems and mental health issues, including dementia.

Ocular syphilis: can cause pain in the eye, blurry vision, sensitivity to light or blindness.

Otosyphilis: Affects the person's hearing and/or balance can case tinnitus, vertigo and sudden hearing loss.

Congenital syphilis: Congenital syphilis acquired in utero (transmitted from mother to a child during gestation).

- **Clinical features:** Deafness Blindness, bone and joint problems, meningitis, seizures and triad notched teeth.

Epidemiology

The venereal syphilis is worldwide in distribution. During the second world war the incidence of syphilis increased and reaches its peak in 1946. Each cases of syphilis is the potential source of small outbreak of the disease. Today the syphilis is increase more rapidly in United state and Canada. The world Health organization (WHO) estimates that there are 12 million new cases of syphilis per year. In 2020, WHO estimated that 7.1 million adults aged 15–49 acquired syphilis globally. The high-risk group for syphilis in the United State and Canada include the sexually active teenager, sexually abused children and prostitutes of either sex or their customers. Unprotected sexual intercourse is one of the increases among gay and bisexual men. (***Burton Goldberg groupThedefinitive Guide Fife WA: Future medicine Publishing in 1995***). In 2006 64% of the reported (P&S) syphilis cases were among men who have sex with man (MSM) have been reported in various cities including Chicago, Seattle, San Francisco, Southern California, Miami and New York city.

Laboratory Diagnosis

The diagnosis of syphilis is based on the person's clinical and sexual history, physical examination, laboratory testing and sometimes radiology, as symptoms are not common or noticeable. Laboratory tests for syphilis include direct detection of *T. pallidum* through a microscope (bacteriological tests) or indirect methods such as blood tests. Rapid tests are also available and can provide results in minutes. serological test for the detection of antibodies in the patient's serum.

Treatment

The early stage of syphilis is treated antibiotic given either intramuscularly ***(Benzathine, penicillin or ceftriaxone)*** and orally ***(Doxycycline, minocycline, tetracycline or azithromycin).***

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Pregnant women should be treated with either aqueous crystalline penicillin Gor aqueous procaine penicillin G. Children who acquired syphilis after birth treated with ***benzathine penicillin G.***

Prevention and control:

- Education to people about syphilis.
- Education about protected sexual behaviour and including the use of condoms. Syphilis can also spread through contact with other areas of the body not covered by a condom, including genitals, anus and mouth.
- Pregnant women should be tested for syphilis to reduce the risk of congenital syphilis in the infants.
- People diagnosed with syphilis should notify their sexual partners to prevent new infections.
- The only reliable methods for preventing the transmission of syphilis are abstinence or monogamous relationship between uninfected partner.

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