Syphilis: a brief introduction

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Why should we worry about syphilis in our homeless programs?

- Syphilis is an interesting STD with a lifelong impact on patients
- Syphilis has historical significance that is still important in patient – clinician relationships and trust
- Syphilis testing and treatment is complex
- Syphilis is increasing in America, and likely in our homeless patients
Goals

- Learn the basics of syphilis infections, their spread and their complications
- Learn about risks for acquiring syphilis
- Learn resources for quickly finding up to date treatment recommendations
- Review ways to non-judgmentally discuss STDs with patients, communities
Spread of syphilis

- Spread during contact with mucus membranes (penis, vagina, throat, anus)
- People without symptoms allow it spread
- Condoms may help control spread
- The longer you have syphilis, the less contagious it is
Syphilis: A LONG history

- First European epidemic 1493, but probably present much earlier.
- Controversy: Columbus brought syphilis TO Europe from New World vs to the New World FROM Europe.
- Historical names:
  - The Great Pox
  - The French Disease
  - Lues venereum
Prevention and Control

Social disease = Venereal disease = Sexually transmitted disease
Syphilis in America

- The Tuskegee syphilis study
  - 1932 – 1972
  - 399 black men with syphilis; to study “natural course of disease”
  - No informed consent
  - Never received treatment, even when penicillin available

- Long term fallout
  - Lack of trust in research, experiments, healthcare, doctors, nurses, etc.
Syphilis Cause

Spirochete bacteria called Treponema pallidum

FIG. 39-2. Electron microscopic study of the morphology of pathogenic spirochetes. Top: Treponema pallidum from exudate of infected rabbit. (×16,500) Middle: Leptospira interrogans serotype icterohaemorrhagiae from broth culture. (×17,000) Bottom: Borrelia duttonii from the blood of an infected mouse. (×8,500) (Swain RHA: J Path Bact 69:17, 1955)
Incubation: ~3 weeks

Primary Syphilis: 2-6 weeks duration

Secondary Syphilis: 2-12 weeks post contact (ave 6) 2-6 weeks

Latent Syphilis: 4 wks-30 yrs

Tertiary Syphilis
Primary Syphilis

- A single sore (called a chancre) (rarely multiple sores) that is painless
- Time between infection to sores is 10 to 90 days (average 21 days)
- Sore disappears after about 3 – 6 weeks without treatment
- Without treatment, though, syphilis in the body continues to progress, and can be passed to others!
Primary Syphilis
Primary Syphilis
Secondary Syphilis

- Skin rashes (non-itchy)
  - Looks like LOTS of different conditions
  - May be so faint as to not be noticed
- Can get fever, sore throat, swollen glands, headaches, achiness, fatigue and weight loss
- Eventually all symptoms go away without treatment
- Without treatment, though, syphilis in the body continues to progress and can be passed to others!
Secondary Syphilis

Condylomata Lata
Latent (hidden) syphilis

- The syphilis infection remains in the body if the syphilis was never treated
- Can last years to decades
- Less likely to be infectious to others the longer the latent period lasts
Late syphilis

- 15% of people with latent syphilis will develop late syphilis years/decades after the original infection
- Treatment may not be able to reverse the damage at this stage
- Internal organs are damaged
  - Brain and nerves
  - Eyes
  - Heart, blood vessels
  - Liver
  - Bones and joints
- Problems include
  - Paralysis
  - Blindness
  - Numbness and lack of coordination
  - Dementia/ “going crazy”
Congenital syphilis

- A pregnant woman with syphilis is at greater risk for a stillbirth
- Babies born with syphilis may have seizures, birth defects and be developmentally delayed
Congenital Syphilis
Testing for syphilis

- Can examine a swab from a chancre, if present
- Blood tests
  - First, Non-treponemal test
    - VDRL or RPR
  - Confirmed with treponemal test
- Reverse sequencing becoming more common
  - First, treponemal test
  - Follow up with titer from a non-treponemal test
Non-treponemal tests

- The RPR (rapid plasma reagin) and the VDRL (Venereal Disease Research Laboratory) do not directly test for syphilis antibodies.
- They detect anticardiolipin antibodies
  - high rate of false positives, especially in a low prevalence population of patients.
  - False positive results are usually, but not always, of low titer (<1:8)
- After treatment, tests may remain positive at low titers for years
Non-Treponemal Tests – Some Causes of False Positive Reactions

- Autoimmune Disease (like lupus)
- Malaria
- Recent immunization
- Skin diseases
- Tuberculosis
- IV Drug abuse
- Viral infections
- An illness with a fever
- Pregnancy
- HIV
- Other STDs
- Multiple blood transfusions
- Leprosy
- Old age
Treponemal tests

- FTA-ABS (Fluorescent treponemal antibodies absorption), TP-PA (particle agglutination), and EIA (Enzyme Immunoassay) for syphilis IgG

- These tests detect specific antitreponemal antibodies to antigens indicating exposure during the patient’s life.

- A positive test does not mean the patient has currently untreated syphilis; tests remain positive for years - decades.

- Although sensitive and specific, false positives occur, especially in low prevalence populations.
All Syphilis TESTS may stay positive for years.
Traditional syphilis testing

Syphilis Testing

INDICATIONS FOR TESTING
- Suspected syphilis:
  - Cephalic lesions present
  - Suggestive STI history
  - Current STI

PERFORM
- Non-treponemal testing:
  - Treponema pallidum (Rapid Plasma Reagin) with Reflex to Titer
  - Treponema pallidum (VDRL), Serum with Reflex to Titer

  positive

  negative

  Consider retesting in 3–12 months if patient remains in risk category

  False-positive RPR or VDRL may be caused by:
  - HIV
  - HSV
  - Malaria
  - IVDU
  - SLF
  - RA
  - Pregnancy
  - Leprosy
  - Endemic treponematoses

  Nonreactive test result suggests false positive

  Treponema pallidum Antibody (FTA-ABS) with Reflex to Titer, FTA-ABS
  OR
  Treponema pallidum Antibody by TP-PA
  OR
  Treponema pallidum Antibody IgM by ELISA
  OR
  Treponema pallidum Antibody, IgG by Immunoblot

  reactive

  Syphilis likely stage disease using:
  - Sexual history
  - Syphilis treatment history
  - Physical exam

  Primary stage:
  - Oral chancre
  - Genital chancre
  - OR
  - Secondary stage:
  - Rash
  - Condyloma lata

  Early latent:
  - Asymptomatic
  - Negative test <1 year ago

  Unknown latent:
  - Asymptomatic
  - No previous testing

  Late latent:
  - Asymptomatic
  - Duration >1 year

  Treat according to CDC guidelines

  Repeat titers:
  - Treponema pallidum (Rapid Plasma Reagin) with Reflex to Titer
  - Treponema pallidum (VDRL), Serum with Reflex to Titer

  4-fold decline in titers at 12 months

  Cure

  Treatment failure or re-infection; follow recommended guidelines.
Reverse sequence syphilis testing

Nonreactive

Syphilis IGG EIA

Reactive

Equivocal

Repeat EIA

Nonreactive

Equivocal or reactive

RPR

Nonreactive

Reactive

(perform titer)

FTA-ABS test

Nonreactive

Reactive

Not syphilis?

Syphilis

Probable past infection with *T. pallidum*; cross reactivity with other spirochete related antigens cannot be ruled out. Also, consider previously treated, late latent, or late syphilis. Clinical history necessary for test interpretation. False positive results cannot be excluded.

Probable false positive syphilis test. However, past infection with syphilis cannot be entirely ruled out. Suggest repeating Syphilis screening test if clinically indicated.

Presumptive evidence of current infection (or inadequately treated infection, persistent infection or re-infection). Clinical correlation with patient symptoms and treatment history necessary for test interpretation.

No serological evidence of infection with *T. pallidum* (early primary syphilis cannot be excluded) Retest in 2-4 weeks if Syphilis is clinically suspected.
What the HCH community can do

- Encourage testing!!
- Encourage, assist patients to follow up to get their test results
- Encourage, assist patients to get necessary treatments
- Encourage, assist patients to get necessary follow up testing (which will occur over the next 1 – 2 years)
- Help patients understand that just because the sore, the rash or the fever went away, the syphilis will still be there without treatment!
Reminder: course of syphilis

Natural History of Untreated Syphilis

UNTREATED SYPHILIS

Primary | Secondary | Latent | Latent (Tertiary)

(early ≤2 yr; late ≥2 yr)

100 ———— 100 ———— 75 ———— 30 {20 incapacitated
30 recur 45 permanently latent
25 recover

10 dead}
Transmission

- You can help!
Primary and Secondary Syphilis—Rates by Sex and Male-to-Female Rate Ratios, United States, 1990–2009
Primary and Secondary Syphilis—Rates by Age and Sex, United States, 2009
Primary and Secondary Syphilis—Rates by Race/Ethnicity, United States, 2000–2009
Primary and Secondary Syphilis—Rates by State, United States and Outlying Areas, 2009

NOTE: The total rate of primary and secondary syphilis for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 4.6 per 100,000 population.
So...who is at most risk

- Men (especially men who have sex with men)
- Young adult (especially between 20 – 29)
- African-American
- Live in the southern USA (closely followed by Southwest, upper Midwest and East)
So...who are the homeless

- Men – 54% of homeless are men
- 25% of homeless between 25 – 34; teens and young adults are a growing percentage of the homeless population
- African-Americans are largest racial group – 42% of all homeless
- More than half of all homeless people on a single night were found in just five states: California, New York, Florida, Texas and Michigan Their share is disproportionate, as these states constitute only 36% of the total U.S. population.
Why doctors can’t do it alone

- Patients need to get tested and they need follow up after testing
- High risks for STDs (including syphilis) includes:
  - multiple sexual partners,
  - men having sex with men,
  - alcohol and substance abuse.
- May be weeks between getting a test done and having all the information necessary to interpret the test result
Treatment of Syphilis

Caveat: The earlier you diagnosis syphilis, the easier it is to treat it
Best resource for up to date treatment

- “Penicillin G, administered parenterally, is the preferred drug for treating all stages of syphilis. The preparation used (i.e., benzathine, aqueous procaine, or aqueous crystalline), the dosage, and the length of treatment depend on the stage and clinical manifestations of the disease.”
Most common PCN treatments

- Primary, secondary, early latent: Benzathine penicillin G 2.4 million units IM x1 (Bicillin LA)
- Late latent or unknown latent: Benzathine penicillin G 2.4 million units IM x3, each 1 week apart
- For PCN allergic: Doxycycline or Tetracycline for 2 weeks.
Syphilis follow up

- Clinical and serologic evaluation should be performed 6 months and 12 months after treatment.
- A four-fold decrease in RPR or VDRL is indicative of a successful response.
- Treatment failure can occur with any regimen. However, definitive criteria for cure or failure have not been established.
- Nontreponemal test titers might decline more slowly for persons who previously have had syphilis.
- Reinfection can occur!
Take Home Points

- Syphilis is increasing, especially among young, black men.
- Syphilis does not go away without treatment, and may result in symptoms decades after the initial infection.
- Interpretation of test results is complex, and often requires 2 or 3 tests performed in sequence over days to weeks combined with a thorough patient history and physical exam.
Take Home Points

- Identification, testing and follow up of syphilis in the homeless community requires sustained teamwork:
  - Physicians and nurses
  - Outreach workers
  - Shelter staff
  - Drug and alcohol treatment staff
  - Others...
# A single episode of syphilis

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Gets third PCN shot
A single episode of syphilis

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“One-half of the troubles of this life can be traced to saying “yes” too quickly and not saying “no” soon enough”.  

Josh Billings, Politician (1818-1885)