Microbiology 20 Clinical Correlate 1
Syphilis and the Tuskegee Experiments

Learning Objectives:
• Learn about the cause of Syphilis
• Understand the symptoms of the different stages of Syphilis
• Demonstrate background knowledge and ramifications of the Tuskegee Experiments
• Know how ethics are involved with all scientific experiments

In the early 1900s, syphilis infections were as common as 1 in 13 Americans. With the development of the antibiotic penicillin, the number of infected individuals fell dramatically.

Syphilis is a worldwide problem. It is caused by the bacterium Treponema pallidum, which has a spirochete shape (spiral). The AIDS epidemic and illegal IV drug use of the 1980s and 1990s are linked to increases in syphilis levels in the U.S., but had reached all time lows in the early 2000s. It is hoped that eradication of the disease can happen soon (eradication is the total removal of the disease from the world and is only possible for human only infections such as syphilis).

Most cases of syphilis are spread through sexual intercourse. During intercourse, the T. pallidum gets access to the tissue right below the top layers of skin (subcutaneous) by entering through a mucosal lining or small tears in the skin (small tears are very common during sexual intercourse). Sexual intercourse with an individual that has an active primary lesion (see below) of syphilis leads to a 50% probability of passing the infection. After 4 years of infection, the individual is less likely to transmit the infection. Congenital syphilis is when syphilis is passed along from a mother to a fetus either through the placenta or directly upon birth. Syphilis is most common among people that have multiple sexual partners.

Primary syphilis: Characterized by the development of a chancre (a painless ulcer at the site of contact with bacteria). Has a smooth base and raised border while there is no fluid or massive inflammation however, there is a lot of bacteria in the lesion making it very easy to pass infection. Sites where the chancre may be are the external genital, cervix, mouth, perianal area or the anal canal. It takes 2 to 8 weeks to heal the lesion. This is unlike a herpes lesion in that it is NOT painful.

Secondary syphilis: Secondary syphilis is also called disseminated (all over) syphilis. About 2 to 12 weeks after the chancre clears, 25% of untreated individuals will develop secondary syphilis. A strong immune response happens trying to get rid of the disease. The immune response causes fever, malaise (week feeling) and lymphadenopathy (swollen lymph nodes) especially of the epitrochlear lymph nodes (those lymph nodes right above the elbow). The most typical sign of secondary syphilis is the development of a rash made up of small red rash circles throughout the
body especially on the palms and feet. Spontaneous (just happens) recovery happens in a few days to 10 weeks.

**Latent syphilis:** Upon secondary syphilis recovery, the patient has bacteria still in the blood if left untreated. They may still spread it through blood transfusions but not commonly through sexual intercourse.

**Tertiary syphilis:** 5 to 30 years after infection, 25 to 40% of the patients with untreated, latent syphilis will develop this inflammatory disease. (Inflammatory disease is a lot of inflammation and common in more dangerous forms of infections). It is characterized by neurological destruction, cardiovascular destruction and gummas (gummy lesions throughout the body).

**Treatment:** Syphilis at any stage is treated with penicillin treatment. The amount of penicillin is dependent on how aggressive the disease is at that stage.

*Treponema pallidum,* which has a spirochete shape (spiral) are shown as well as larger cells which are human cells (notice the size difference). Looking for the bacteria is common way to diagnose the disease.
Vocabulary to Know:
(Will be assessed during Lecture Quiz #1 on September 7, 2019 @ 11:30am)

Treponema pallidum
Chancre
Malaise
Lymphadenopathy

Essay Prompt:
(Turn in one-page HAND WRITTEN ESSAY on September 7, 2019 @ 11:30am)
In the near future you are working in a clinic and are counseling an elderly patient (65 year old male) that has come to your clinic by the insistence of their adult child. The adult child brought in the patient for a physical. You notice that the patient is not happy to be there and seems very anxious. You ask why, and they say it is because they recently read the book Bad Blood and are very concerned coming to you for a wellness visit after hearing about the Tuskegee experiments. In a one-page essay explain to the patient (Mr. Smith) the overall details of what events occurred in the Tuskegee experiments and the ways that are in place in a medical setting to make sure that never happens again.

Special Note: Lecture Quiz #1 on September 7, 2019 @ 11:30am
This is a short answer quiz consisting of ten questions that is given at the beginning of class. There are no makeups for these quizzes.

The quizzes normally cover what is covered in the previous lecture.

However, for Lecture Quiz #1 due to the short lecture, the quiz we will cover
  • Lecture topics: 4 questions
  • Lab safety topics: 4 questions
  • Clinical Correlate Vocabulary: 2 questions
Each question is worth 1 point and the total quiz is worth 10 points (1% of your final grade).