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Tuberculosis

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What is tuberculosis?

- Tuberculosis (TB) was once the leading cause of death in the United States.
- TB is a disease caused by a bacterium called Mycobacterium tuberculosis.
- TB likes to grow in oxygen and blood rich areas of the body.
- TB typically attacks the lungs, but TB can attack any part of the body (kidneys, spine, brain).
- If not treated properly, it can be fatal.

Prevalence

- TB is one of the WORLD'S deadliest diseases.
- 1/3 of the WORLD'S population is infected with TB.
- In 2012, nearly 9 million people around the world became sick with TB disease.
- In 2012, there were around 1.3 million TB related deaths worldwide.
- TB is a leading killer of people who are HIV infected.

Despite the increasing numbers worldwide, the rate of reported cases in the United States has been declining since 2010.

How is TB spread?

- TB is spread through the air from one person to another.
- The TB bacteria are put into the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks, or sings.
- People nearby may breathe in these bacteria and become infected.

How is TB NOT spread?

- Shaking someone's hand
- Sharing food or drink
- Touching bed linens or toilet seats
- Sharing toothbrushes
- Kissing
- Sitting in their room

Types of TB

NOT EVERYONE THAT BECOMES INFECTED WITH TB BACTERIA BECOMES SICK. THIS IS WHY THERE ARE 2 SEPARATE CATEGORIES OF TB.

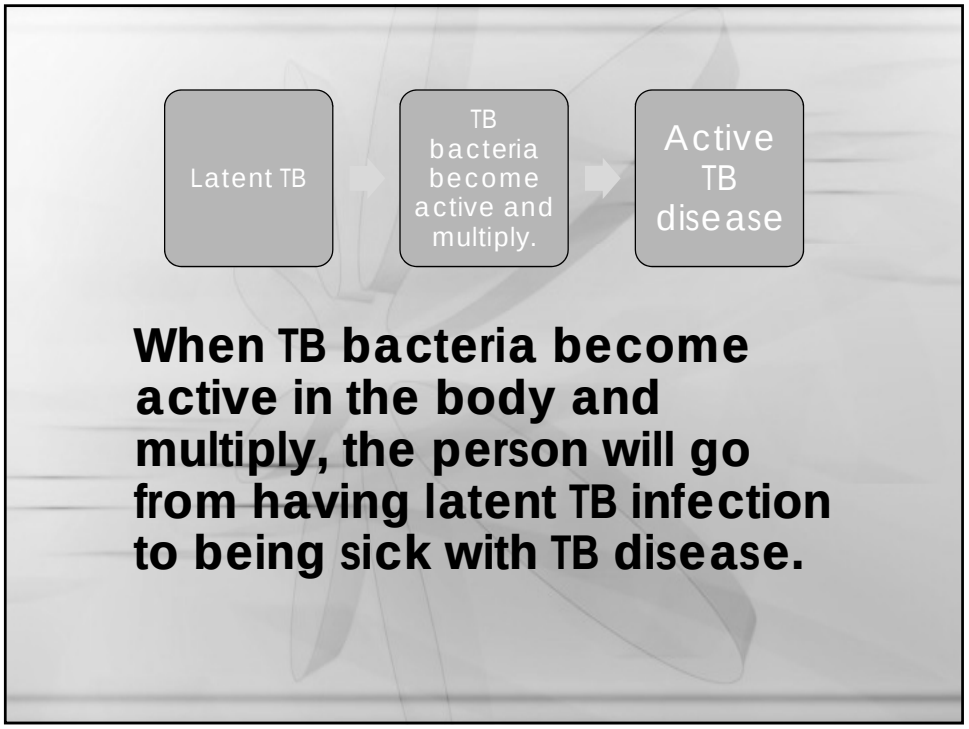
1. LATENT TB (ALSO CALLED INACTIVE TB OR DORMANT TB)

2. TB DISEASE (ALSO CALLED ACTIVE TB OR REACTIVE TB)

WE WILL ALSO DISCUSS DRUG RESISTANT TB

Latent, Dormant or Inactive TB

- Latent TB infection is when the bacteria can live in the body without making you sick.
- The body is able to fight the bacteria and stop them from growing.
- People with latent TB infection do not feel sick and do not have any symptoms.
- People with latent TB infection are not infectious and cannot spread TB bacteria to others.



When TB bacteria become active in the body and multiply, the person will go from having latent TB infection to being sick with TB disease.

TB Disease (Active TB)

- TB bacteria become active when the immune system can't stop them from growing.
- When TB bacteria are active (multiplying in your body), this is called TB disease.
- People with TB disease are sick and may be contagious.

A Person with Latent TB Infection	A Person with TB Disease
•Has no symptoms	•Has symptoms that may include: • a bad cough that lasts 3 weeks or longer • pain in the chest • coughing up blood or sputum • weakness or fatigue • weight loss • no appetite • chills • fever • sweating at night
•Does not feel sick	•Usually feels sick
•Cannot spread TB bacteria to others	•May spread TB bacteria to others
•Usually has a skin test or blood test result indicating TB infection	•Usually has a skin test or blood test result indicating TB infection
•Has a normal chest x-ray and a negative sputum smear	•May have an abnormal chest x-ray, or positive sputum smear or culture
•Needs treatment for latent TB infection to prevent TB disease	•Needs treatment to treat TB disease

Risk Factors

- 1. Having a weakened immune system
- 2. Having international connections
- 3. Living in or being around substance abuse or poverty
- 4. The environment in which you live and work

Having a Weakened Immune System

A healthy immune system can often fight TB bacteria successfully, but your body can't mount an effective defense if your resistance is low.

A number of diseases or medications can weaken your immune system, including:

- HIV/AIDS
- Diabetes
- End-stage kidney disease
- Certain cancers
- Cancer treatment, such as chemotherapy
- Drugs to prevent rejection of transplanted organs
- Some drugs used to treat rheumatoid arthritis, Crohn's disease and psoriasis
- Malnutrition
- Very young or advanced age

International Connections

TB risk is higher for people who live in or travel to countries that have high rates of tuberculosis, such as:

- Sub-Saharan Africa
- India
- China
- Mexico
- The islands of Southeast Asia and Micronesia
- Parts of the former Soviet Union

Depending on your travel plans, you may want to speak with a medical professional to see what preventative steps you may need to take.

Poverty and Substance Abuse

- Lack of medical care: If you are on a low or fixed income, live in a remote area, have recently immigrated to the United States, or are homeless, you may lack access to the medical care needed to diagnose and treat TB.
- Substance abuse: Long-term drug or alcohol use weakens your immune system and makes you more vulnerable to tuberculosis.
- Tobacco use: Using tobacco greatly increases the risk of getting TB and dying of it. (According to the World Health Organization, "Smoking makes the patient more prone to relapse and reinfection. Smoking delays the sputum conversion in sputum positive tuberculosis cases. This increases the chances of transmission to others.")

Where you Live and Work

- Health care work: Regular contact with people who are ill increases your chances of exposure to TB bacteria. Wearing a mask and frequent hand-washing greatly reduce your risk.
- Living or working in a residential care facility: People who live or work in prisons, immigration centers or nursing homes are all at risk of tuberculosis. That's because the risk of the disease is higher anywhere there is overcrowding and poor ventilation.
- Living in a refugee camp or shelter: Weakened by poor nutrition and ill health and living in crowded, unsanitary conditions, refugees are at especially high risk of tuberculosis infection.

Potential Symptoms of TB

- A bad cough that lasts 3 weeks or longer
- Pain in the chest
- Coughing up blood or sputum
- Weakness or fatigue
- Weight loss
- No appetite
- Chills
- Fever
- Sweating at night

Conditions likely to Speed the Transition from Latent TB to TB Disease

- HIV infection
- Recently infected with TB bacteria (in the last 2 years)
- Comorbid conditions such as diabetes or cancer, that make it hard for the body to fight bacteria
- Alcohol or illegal drug abuse
- Improper treatment of a previous TB infection
- On chemotherapy (due to a suppressed immune system)

Getting Tested

- 1. A simple skin test
- 2. Blood tests
- 3. Chest x-ray
- 4. Sputum sample

Skin Test

- The most commonly used diagnostic tool for tuberculosis is a simple skin test.
- A small amount of a substance called PPD tuberculin is injected just below the skin of your inside forearm.
- The results are assessed within 48-72 hours
- The reaction MAY indicate a positive reaction.
- **Although this is the most common test for TB, there are a number of false positives and false negatives thus the reason one would be encouraged to have a second test, especially if exposed to TB.**

Blood Test

- Blood tests may be used to confirm or rule out latent or active tuberculosis.
- These tests use sophisticated technology to measure your immune system's reaction to TB bacteria.
- These tests are relatively new and not all areas have access to them.

Chest X-ray

- Most common follow up if you've had a positive skin test.
- They are looking for potential white spots in your lungs where your immune system has walled off TB bacteria.
- May reveal changes in your lungs caused by active tuberculosis.

Sputum Sample

- Following a positive chest x-ray, the doctor may take samples of your sputum — the mucus that comes up when you cough.
- The samples are tested for TB bacteria.
- These bacteria can also be tested to see if they are resistant to the effects of medications commonly used to treat tuberculosis.
- This helps your doctor choose the medications that are most likely to work.

Treatment for Latent Tuberculosis

- The goal is to keep you from developing TB disease.
- Treatment of latent TB infection reduces the risk that TB infection will progress to TB disease.
- Treatment of latent TB infection is essential to controlling and eliminating TB in the United States.
- The decision about taking treatment for latent TB infection will be based on your chances of developing TB disease

Treatment for Tuberculosis Disease

- TB disease can be treated by taking several drugs, usually for 6 to 9 months.
- The exact drugs and length of treatment depend on your age, overall health, possible drug resistance, and the infection's location in the body.
- Compliance with the treatment regime is very important.
- If you do not take the drugs correctly, the germs that are still alive may become resistant to those drugs, making it harder and more expensive to treat.

The Most Common Medications Used in TB Treatment

- Isoniazid
- Rifampin (Rifadin, Rimactane)
- Ethambutol (Myambutol)
- Pyrazinamide

*Typically only one drug is needed for latent TB infections, but multiple drugs are used in the treatment of TB disease.

Isoniazid

- Tablet and injections are available
- Dosage and duration varies between individuals and is based partially on age, past medical history, type of TB
- Despite feeling better, the medication must be completed
- Many drug and food interactions
- Drug of choice for latent TB

Rifampin (Rifadin, Rimactane)

- Antibiotic, prevents bacteria from spreading in your body
- Many drug and food interactions
- Pregnancy category C
- Used when Isoniazid is not tolerated for latent TB

Ethambutol (Myambutol)

- Antibiotic
- Typically used in a shorter duration
- Side effects can be numerous, but focus on dizziness and nausea

Pyrazinamide

- Should not be used alone for treatment of TB
- Used in conjunction with other antibiotics

Please encourage COMPLIANCE with medication regime. The medication, dosage, and duration may vary with each patient. Regardless of formula used, compliance is imperative.

Drug Resistant Tuberculosis

- This happens when TB bacteria become resistant to the drugs used to treat TB.
- This means that the drug can no longer kill the bacteria.
- Drug-resistant TB is spread the same way that drug susceptible TB is spread.

Drug Resistant TB

- Drug-resistant TB can occur when the drugs used to treat TB are misused or mismanaged. Examples include:
  - When people do not complete the full course of treatment
  - When health care providers prescribe the wrong treatment, the wrong dose, or wrong length of time for taking the drugs
  - When the supply of drugs is not available
  - When the drugs are of poor quality

Prevention

- EDUCATE yourself and those around you!

Prevention

- Do not spend extended periods of time in enclosed rooms with anyone who has active TB.
- It is recommended that the infected individual has been treated for at least 2 weeks.
- Use protective measures, such as face masks, especially if you work in a facility that cares for people who have untreated TB (you should be provided with a specific type of face mask that is fitted properly).
- If you live with someone who has active TB, help and encourage the person to follow treatment instructions

Protective Gear

- Particulate filter respirators certified by the Centers for Disease Control and Prevention's (CDC) National Institute for Occupational Safety and Health (NIOSH) that can be used for protection against airborne M. tuberculosis include:

1. Nonpowered respirators with N95, N99, N100, R95, R99, R100, P95, P99, and P100 filters (including disposable respirators); and

2. Powered air-purifying respirators (PAPRs) with high-efficiency filters

If you THINK you may have been exposed to Tuberculosis…seek medical attention for appropriate diagnostic testing and treatment.

Vaccination

- Despite being utilized in 100 other countries, the vaccine BCG is currently NOT recommended for most individuals in the United States.

References

- http://www.cdc.gov
- http://www.mayoclinic.org
- http://www.searo.who.int
- http://www.niaid.nih.gov

??Questions??