Introduction and Treatment of TB

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European AIDS Treatment Group

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STEP-UP: Skills Training to Empower Patients

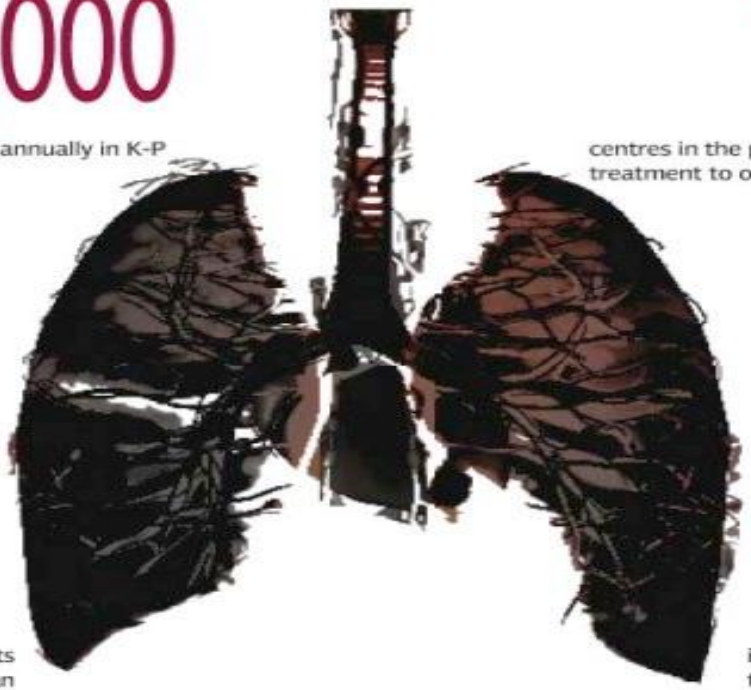
What is tuberculosis?

Tuberculosis - is a chronic infectious disease that usually affects the lungs, although it can spread to other organs around the body

History of Tuberculosis

Mycobacterium tuberculosis existed 15,000 to 20,000 years ago. It has been found in relics from ancient Egypt, India, and China. Among Egyptian mummies spinal tuberculosis, known as Pott's disease has been detected by archaeologists

Facts and Data'



40,000
people are affected from TB annually in K-P

1,000
centres in the province have given free treatment to over 36,000 patients

231
out of every 100,000 people in the country has TB

230
centres are providing diagnostic facilities for TB

6th
highest number of TB patients reside in Pakistan

95%
is the success ratio of patient treatment in K-P

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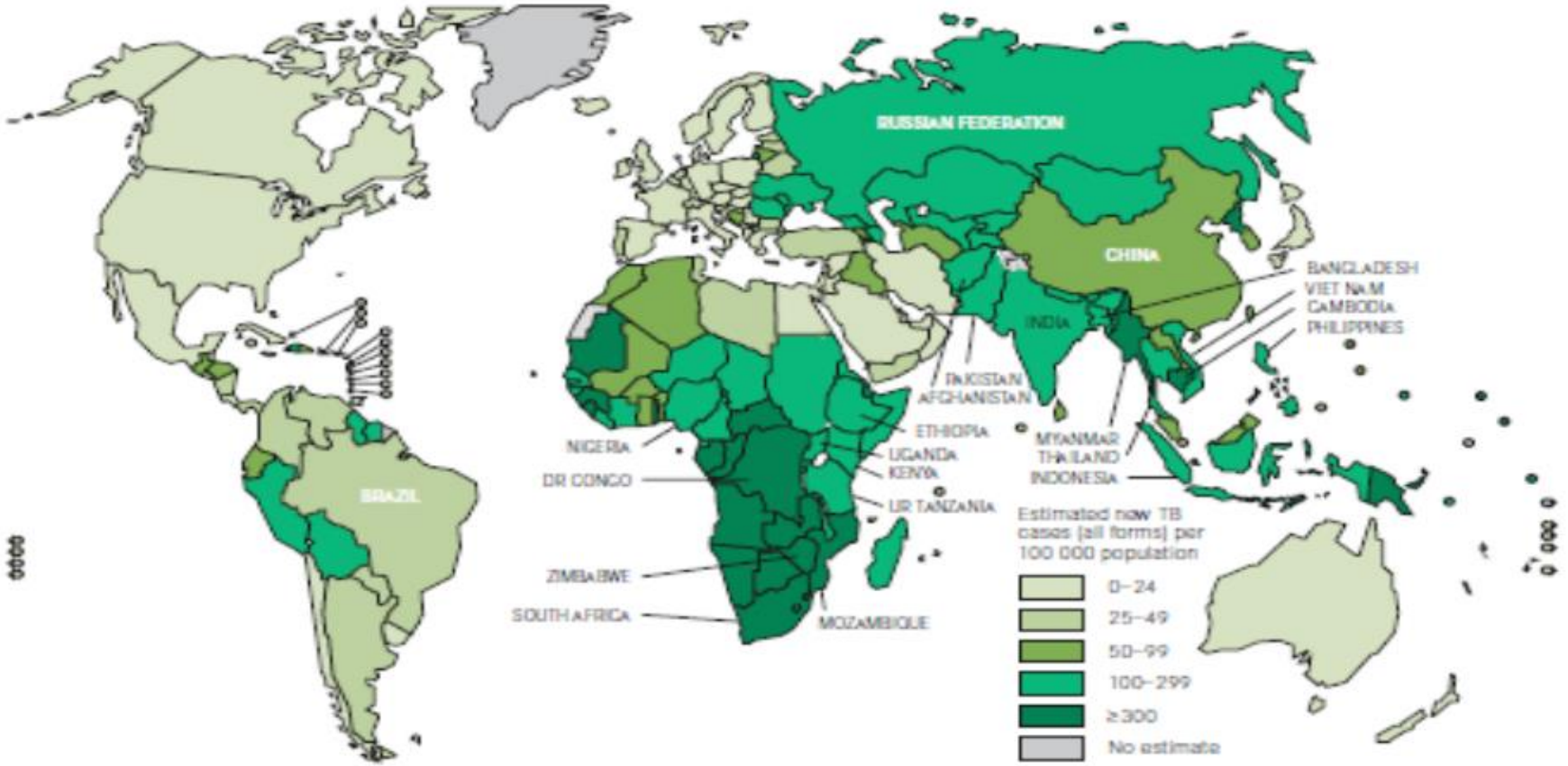
Global TB Map



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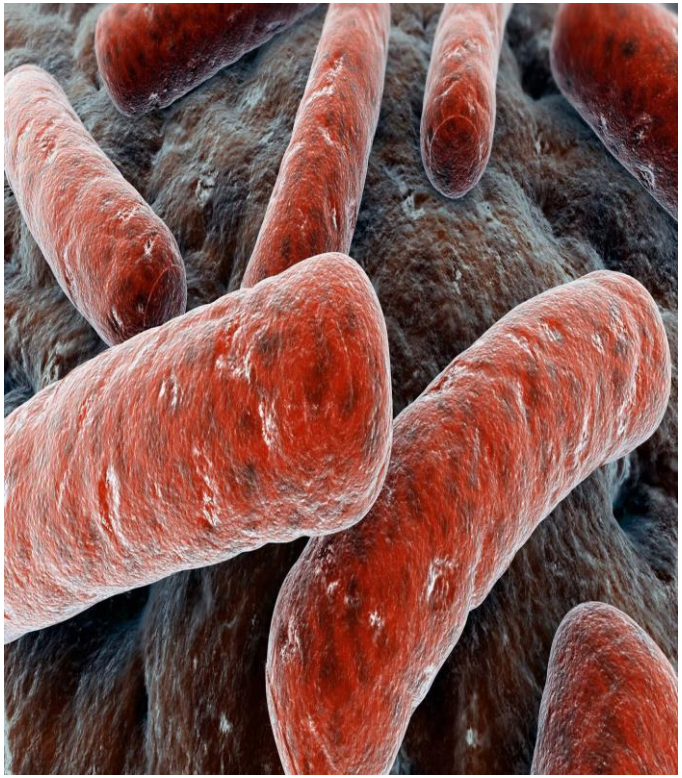
What causes tuberculosis?



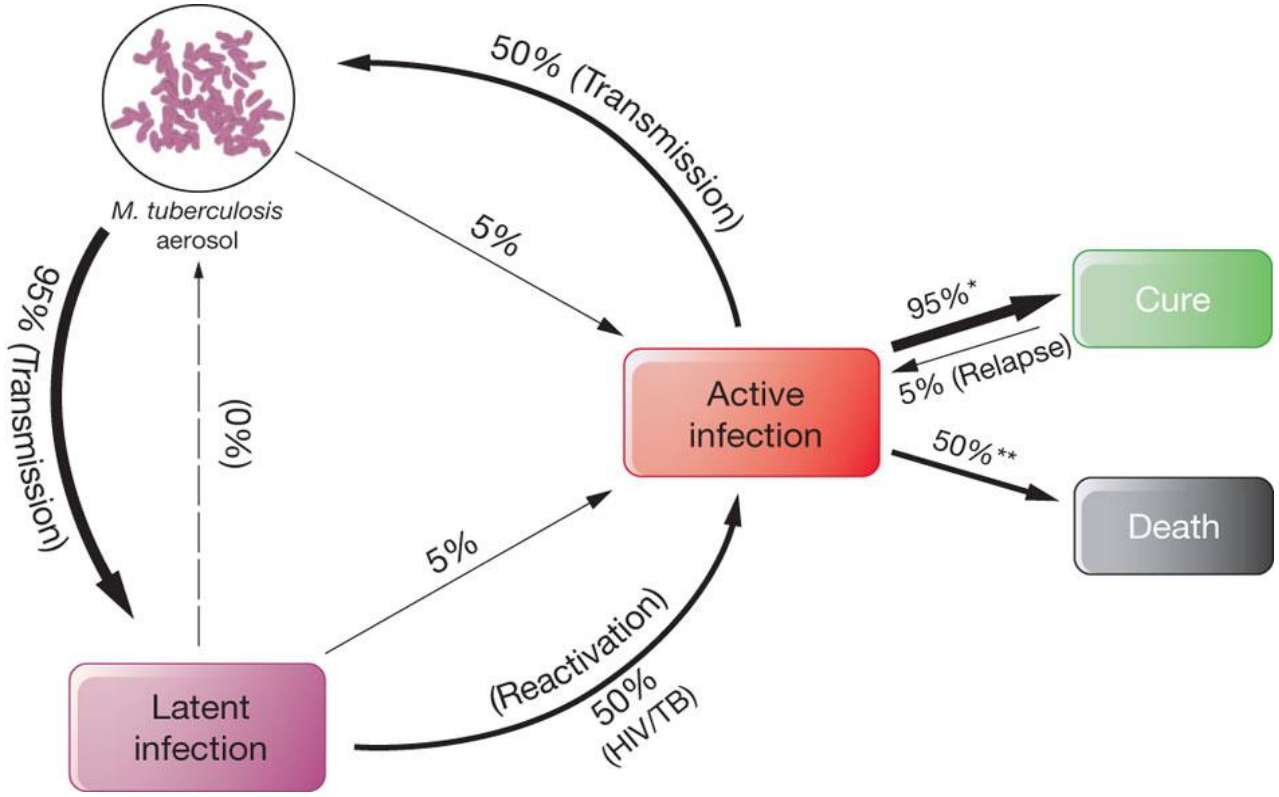
Mycobacterium tuberculosis bacterium causes TB. It is spread through the air when a person with TB (whose lungs are affected) coughs, sneezes, spits, laughs or talks

Two kinds of tuberculosis infection:

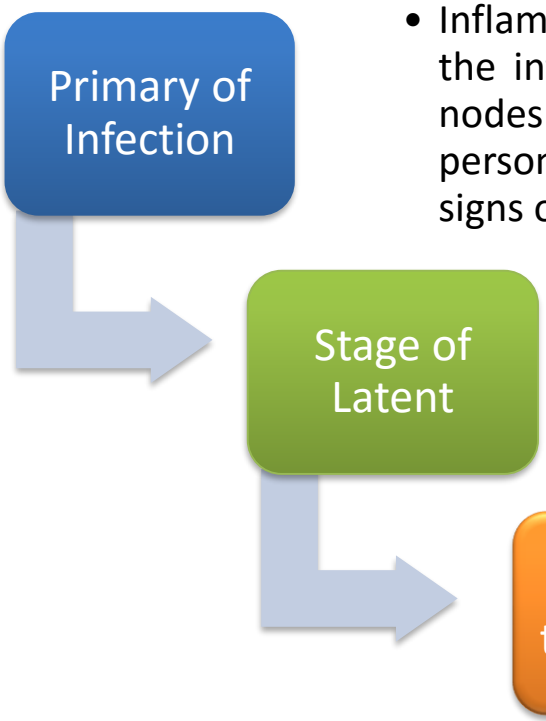
- Latent TB, when the bacteria remain in the body in an inactive state. They cause no symptoms and are not contagious, but they can become active

- Active TB, when the bacteria do cause symptoms and can be transmitted to others

Stages of M. tuberculosis infection

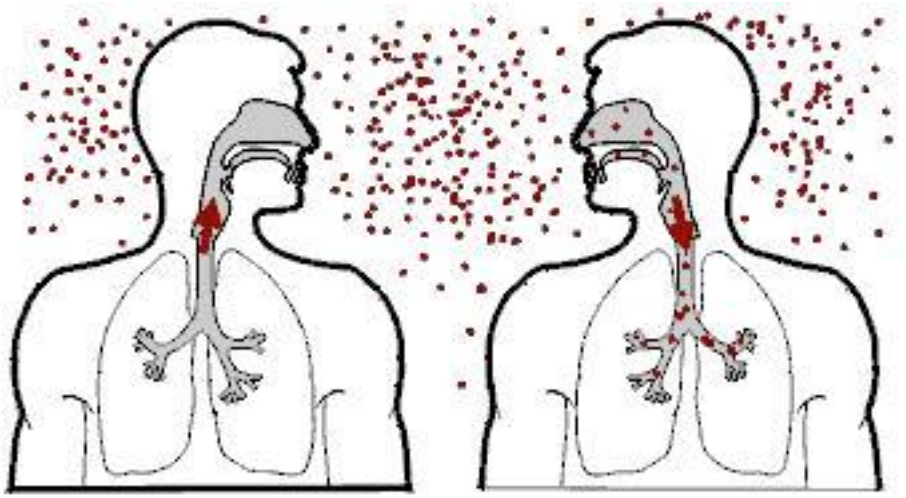


Stages of M. tuberculosis infection



- Inflammation develops locally at the site where the infection hit. This bacteria enter the lymph nodes and form the primary complex. Typically, a person feels good, sometimes there are initial signs of infection
- If the immune system is weakened, the mycobacteria begin to multiply and spread throughout the body. Formed foci of tuberculosis, localized in various organs
- Formed foci begin to hit bodies. Most often affects the lungs. If burst into the bronchi, the person becomes infectious to others

Transmission of tuberculosis



Mycobacterium tuberculosis, is transmitted by droplets when an infected person coughs or sneezes. It is not spread through kissing or other social contact

Symptoms of tuberculosis

While latent TB is symptomless, the symptoms of active TB include the following:

- ✓ A bad cough that lasts 3 weeks or longer
- ✓ Coughing, sometimes with mucus or blood
- ✓ Pain in the chest
- ✓ Chills
- ✓ Fatigue
- ✓ Fever
- ✓ Loss of weight
- ✓ Loss of appetite
- ✓ Night sweats

Why TB as a socially significant infection is very dangerous?

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Tuberculosis usually affects the lungs, but can also affect other parts of the body. When TB occurs outside of the lungs, the symptoms can vary accordingly. Without treatment, TB can spread to other parts of the body through the bloodstream

Clinical forms of tuberculosis

There are two main types of tuberculosis:

- ✓ pulmonary tuberculosis - most often tuberculosis affects the respiratory organs (mainly the lungs and bronchi)

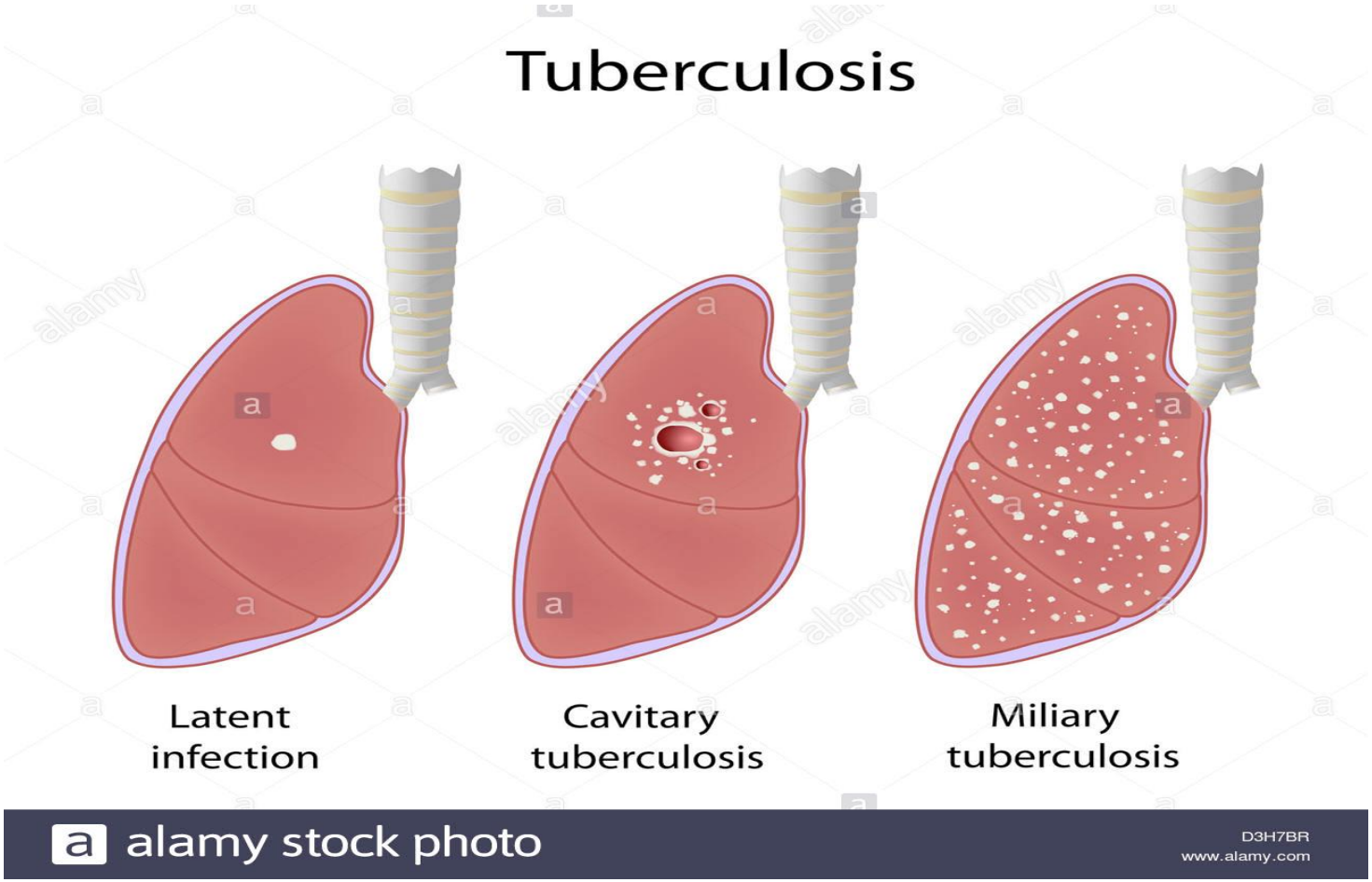
- ✓ pulmonary tuberculosis - genitourinary systems, in bone (skeletal) and joint forms of tuberculosis are most common lesions of the spine and pelvis

Pulmonary tuberculosis

- ✓ latent TB
- ✓ disseminated tuberculosis
- ✓ miliary tuberculosis
- ✓ focal (confined) tuberculosis
- ✓ infiltrative tuberculosis
- ✓ caseous pneumonia
- ✓ tuberculema
- ✓ cavernous tuberculosis
- ✓ fibro-cavernous tuberculosis
- ✓ cirrhotic tuberculosis

Much less common pleural tuberculosis, tuberculosis of the larynx, trachea

Pulmonary tuberculosis



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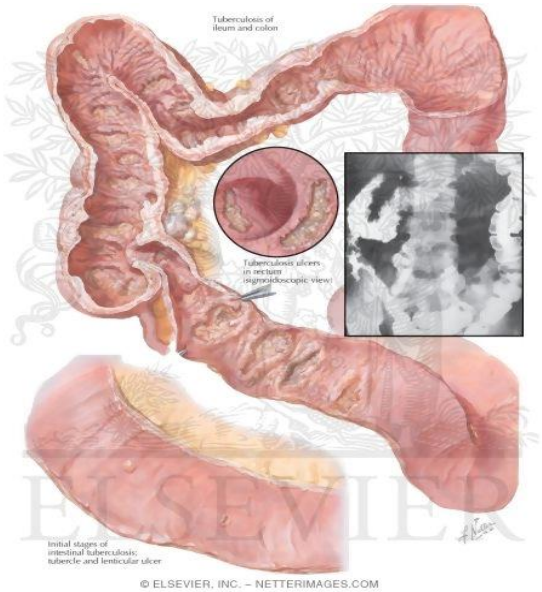
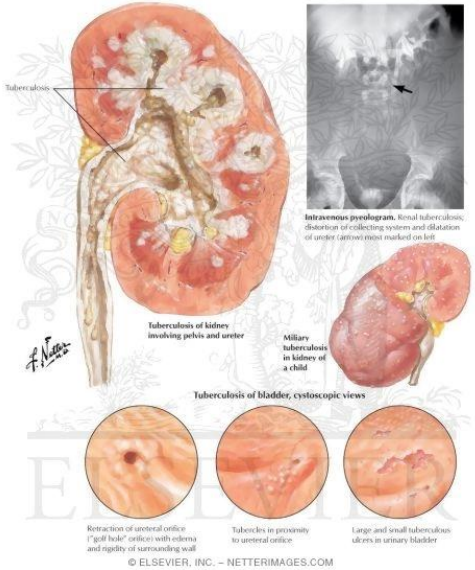
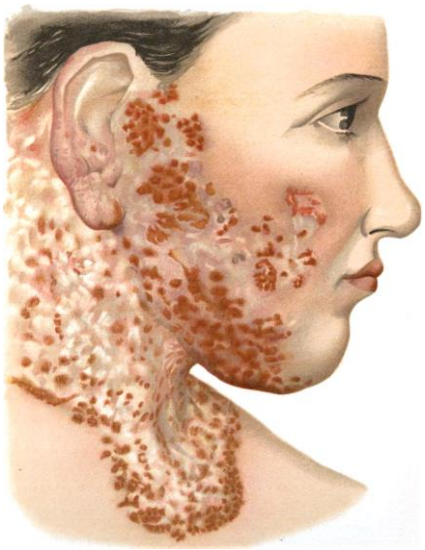
Extra - Pulmonary tuberculosis

- ✓ Tuberculosis of the digestive system - most often affects the distal small intestine and the cecum
- ✓ Tuberculosis of the genitourinary system - kidney, urinary tract, reproductive organs
- ✓ Tuberculosis of the central nervous system and the meninges - the defeat of the brain and spinal cord, hard shell of the brain (tuberculosis meningitis)
- ✓ Tuberculosis of bones and joints - most often affects the bones of the spine
- ✓ Lupus
- ✓ Tuberculosis of eyes

Extra - Pulmonary tuberculosis







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TB Risk Factors

Anyone can get TB , but people at high risk generally fall into two categories:

1. People recently infected with TB bacteria

2. People with medical conditions that weaken the immune system

Increased risk for being infected with TB

- You have spent time with a person with TB disease
- You are from a country or have visited areas where TB disease is very common
- You live or work where TB disease is more common, such as a homeless shelter, prison or jail, or long-term care facility
- You are a health-care worker who works with clients or patients who are at increased risk for TB disease

Higher chance of getting TB disease if

- You have HIV infection
- You are a child younger than 5 years of age
- You have recently been infected with TB bacteria in the last two years
- You have other health problems that make it hard for your body to fight disease
- You smoke cigarettes or abuse alcohol and/or drugs
- You were not treated correctly for latent TB infection or TB disease in the past

Treatment for TB

Must satisfy the following basic therapeutic principles:

1. any regimen must use multiple drugs to which Mycobacterium tuberculosis is susceptible
2. the medications must be taken regularly
3. the therapy must continue for a period sufficient to resolve the illness

Treatment for TB Disease

Three-regimen - at the beginning of anti-TB chemotherapy was developed and proposed three-component diagram of first-line therapy:

- streptomycin
- isoniazid
- para-amino salicylic acid (PAS)

Treatment for TB Disease

Quaternary regimen (DOTS - a strategy used by infection rather susceptible strains)

- rifampicin or rifabutin
- isoniazid
- pyrazinamide
- ethambutol

Treatment for TB Disease

Five-component treatment regimen

Important

- high-quality and varied diet for TB patients,
- weight gain at a reduced weight,
- correction of hypovitaminosis and anemia,
- correction of leukopenia (stimulation of red blood cells and leykopoeza)

TB patients who suffer from alcoholism or drug addiction, must go through detoxification they begin anti-TB chemotherapy

Drug resistance in MTB distinguish

1. Mono-
2. Polyresistance
3. Multidrug resistance (MDR)
4. Super Resistance
5. Cross-resistance

Global Data' on HIV, TB, HCV and HBV

- HIV 33.4 million
- TB 11.1 million
- MDR TB 440 thousand
- HBV 350 million
- HCV 180 million
- HIV/TB* 1.4 million
- HIV/HBV 2-4 million
- HIV/HCV 4-5 million

Treating TB and HIV

The treatment of active TB disease in HIV-infected patients should follow the general principles guiding treatment for individuals without HIV

All patients with HIV/TB disease should be treated with ART

Treating TB and HIV

Important issues related to the use of ART in patients with active TB disease include:

1. when to start ART
2. significant pharmacokinetic drug-drug interactions between rifamycins and some antiretroviral (ARV) agents
3. the additive toxicities associated with concomitant ARV and TB drug use
4. the development of TB-associated IRIS after ART initiation, and (5) the need for treatment support including DOT and the integration of HIV and TB care and treatment

Treating TB and HIV

The treatment of active TB disease in HIV-infected patients should follow the general principles guiding treatment for individuals without HIV

Treatment of drug-susceptible TB disease should include a standard regimen: isoniazid (INH) + a rifamycin (rifampin or rifabutin) + pyrazinamide + ethambutol given for 2 months, followed by INH + a rifamycin for 4 to 7 months

Treating TB and HVC

Standard treatments for TB have been shown to have hepatotoxicity, meaning that they are toxic to the liver and can exacerbate liver disease

- ✓ Treating TB in patients with hepatitis C can require a longer duration of therapy and increased monitoring
- ✓ Both infections are normally treated concurrently, presenting patients with difficult side effects
- ✓ In future, new hepatitis C medicines may alleviate this

Resources:

http://www.cdc.gov/tb/topic/treatment/
http://www.medicalnewstoday.com/
http://www.who.int/tuberculosis
http://www.who.int/features/qa/08/en/
http://www.healthofchildren.com/T/Tuberculosis
http://emedicine.medscape.com/
https://aidsinfo.nih.gov/guidelines/html/1/adult-and-adolescent-arv-guidelines/283/drugs-not-recommended-with-arv-agents