

PBL

Second Case
“Still Coughing”



Case scenario:

- Khalid, 21 years old, male, medical student.
- Comes with persistent cough with some **non-bloody phlegm** and a lot of night sweat for the last 3-4 weeks .
- He noticed shortness of breath when he runs or climbs stairs.
- 3-4 weeks ago, he has been diagnosed with chest infection, The General Practitioner **prescribed a course of Amoxicillin**. His coughing has worsened and has become a productive cough.
- He lost more than **8 kg** of his body weight over the last 4 months.
- Two years ago, he had a **positive mantoux skin test** but normal chest x-ray?
- He is not a smoker nor facing a particular allergy.



Diagnosis:
Pulmonary Tuberculosis

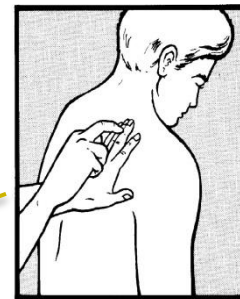
Examination:

- ✓ He looks a little thin.
- ✓ His Body Mass Index is decreased (BMI is 16.2). (**Very low**)
- ✓ Temperature 38.5 (High, but not above 39*)
- ✓ Pulse rate (high)
- ✓ Respiratory rate is (high)
- ✓ His chest is flattened (small Antero-posterior diameter).
- ✓ His sputum is thick with some streaks of blood

*Indication for Tuberculosis

Terms:

1. **Productive cough:** A cough is defined as a productive cough when some types of secretions come up during coughing.
2. **BMI (body mass index):** is a measure for human body shape based on an individual's mass and height.
3. **Percussion note:** Percussion is a method of tapping on a surface to determine the underlying structure, and is used in clinical examinations to assess the condition of the thorax or abdomen.
4. **Streaks of blood:** streak means a line, mark, smear, or band differentiated by color or texture from its surroundings.
5. **Consolidation :** the process of becoming solid, as changing of lung tissue from aerated and elastic to firm in certain diseases
6. **Postero–anterior view:** The x-rays enter through the posterior aspect of the chest, and exit out of the anterior aspect where they are detected by an x-ray film.
7. **Increased lucency :** Refers to a region in an image caused by an absorber of x-ray attenuation than its surrounding tissues (appears lighter)
8. **Cavitation:** are gas-filled areas of the lung in the center of a nodule, mass or area of consolidation.



Pulmonary Tuberculosis

✓ Definition:

- Inhalation of Mycobacterium Tuberculosis in aerosols and dust. (**Airborne transmission**)
- Infected people cough up large number of Mycobacteria.

✓ Investigation:

Applied a Percussion note test: the right upper zone is dull to percussion.

Chest x-ray (Postero-anterior view):

An area of consolidation in the right upper lobe and increased lucency within the area of consolidation consistent with early cavitation .

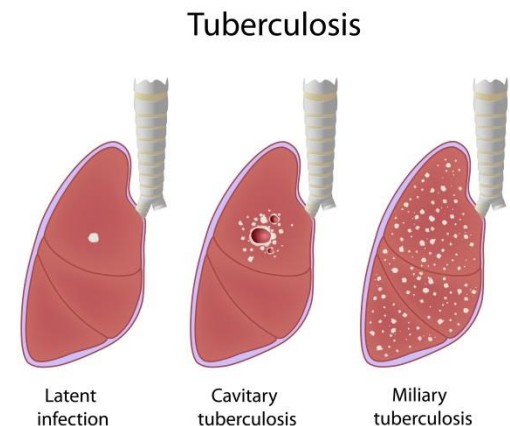
Blood test shows **elevated** erythrocytes sedimentation rate (ESR)

Sputum sample (by **Ziehl-Neelsen** Stain) shows the presence of chronic inflammatory cells, mainly lymphocytes and a large number of acid-fast bacilli (AFB).



✓ Management:

- He has been admitted to an isolation room and commenced on treatment for TB for at least 6 to 9 months.
- The treatment was:
Isoniazid, Rifampicin, Ethambutol, Pyrazinamide and Pyridoxine (vitamin B6). (iREPP)
- He continues to take **Pyridoxine** for 2 months.
- Then the doctor asks him to continue on **isoniazid and rifampicin** for 7 months.
- During this time Khalid is seen by his doctor once every month to check-up and follow-up investigations. (to prevent the disease from spreading), the Health authorities decide to screen people who have been in contact with Khalid before the treatment (usually done by mantoux skin test).



Antimycobacterial drugs



They are divided into two groups for treating TB

First line

- ✚ Treatment of Normal TB
- ✚ Treatment of Latent TB in patients with positive tuberculin skin test
- ✚ Prophylaxis against active TB in individuals who are in great risk .

- Isoniazid (INH)
- Rifampin
- Ethambutol
- Pyrazinamide
- Streptomycin (Not the first line choice)

Second line

- ✚ Resistance to the drugs of 1st line.
 - ✚ Failure of clinical response
 - ✚ There is contraindication for the first line
 - ✚ Used in typical & atypical tuberculosis
 - ✚ 2nd line drugs are more toxic
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- Aminosalicylic Acid (PAS).
 - Rifabutin
 - Fluoroquinolone's (Ciprofloxacin)

Questions

Q1) Discuss the cough reflex and its significance:

Impulses from stimulated **cough receptors** (which are found in some places such as trachea) traverse an afferent pathway via the Vagus nerve to a 'cough center' in the medulla, which itself may be under some control by higher cortical centers. The cough center generates an efferent signal that travels down the Vagus, phrenic, and spinal motor nerves to expiratory musculature to produce the cough.

It results in removal of any irritant substance from respiratory system (protection)

Q2) How is the infection acquired in case of TB?

Airborne transmission. (by inhalation)

Q3) what do you call TB when the infection invades the bloodstream?

Miliary tuberculosis.

Questions

Q4) Mention the name of the test used as a screening tool for tuberculosis (TB).

Tuberculin skin test. (Mantoux test) > Which was used to detect the sensitized cells

False negative result happens in **immunocompromised patients**.

Q5) What is the name of the stain that was used to identify acid-fast bacilli?

Ziehl-Neelsen stain. (ZN)

Q7) What is the type of immune response in TB?

Cell-mediated immunity with delayed hypersensitivity reaction.

Best of luck!



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