Tuberculosis - clinical forms

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DIFFERENCE B/W INFECTION & DISEASE

INFECTION MEANS THAT MTB IS IN THE BODY BUT IMMUNE SYSTEM IS KEEPING THE BACTERIA UNDER CONTROL.
Primary TB Disease

- Primary
- Post-primary (Secondary)

Common primary forms

- Primary complex
- Tuberculosis of the intrathoracic lymph nodes (lymphadenitis)
Most common in children, adolescents and young adults

It has been estimated that 3.1 million children under 15 years of age are infected with TB worldwide. According to the World Health Organization, children with TB represent 10% to 20% of all TB cases.
- Frequently involves regional lymph nodes
- Hematogenous and lymphatic spread
- Hypersensitivity reactions (Para specific symptoms)
- Usually paucibacillary - difficult for microbiology diagnosis
- Difficult to obtain samples for microbiology
- Non infectious in most of the cases
- Usually positive TST

- Usually good prognosis
- Heals often with calcifications
- Dormant MT in calcified lymph nodes or parenchyma - risk for reactivation
In immunocompromised host – dissemination and complications - progressive primary tuberculosis
Pulmonary TB in children can range from an asymptomatic primary infection to a progressive primary TB.

Primary TB is very often characterized by the absence of signs on clinical evaluation. Asymptomatic presentations are more common among school-age children (80-90 %) than in infants less than one year old (40-50 %)
Diagnosis of primary pulmonary Tuberculosis

- HISTORY: contact +, vague ill health, brief febrile illness, cough, anorexia, wheeze, crepts,
- TST +ve
- CXR changes unilateral or bilateral Hilar, Parastrachal L/N, parenchymal lesion, consolidation, collapse,
- SPUTUM rarely produced in children
- GASTRIC WASHING for AFB Staining (rarely positive)
- Gastric washing for AFB C/S (POSITIVE IN 20-25% CASES)
- PCR: (Mycobacterial DNA amplification techniques)
Disseminated tuberculosis

a form of the disease that affects many sites in the body simultaneously and is not limited to the lungs

Disseminated (miliary) tuberculosis and tuberculous meningitis are acute, severe forms of tuberculosis caused by the haematogenous spread of the bacilli, often occurring soon after primary infection.

They occur most often in children and young adults. Unlike pulmonary tuberculosis, these acute forms are highly fatal.
Characteristic chest radiograph

A “miliary” pattern may be seen on a good quality anterior radiograph: extensive, tiny (1-2 mm) nodules resembling millet seeds, all the same size and spread symmetrically over both lungs.
Smear microscopy of sputum from cases with disseminated (miliary) tuberculosis is usually negative, as the disease is paucibacillary.

- TST is usually negative!!!
- IGRAs are preferred
- Chest x-ray may be normal at the beginning (repeat after 8-10 days)
When disseminated forms of TB are suspected, treatment should be commenced immediately without waiting for bacteriological proof of diagnosis.
Post-primary TB

The existence of post-primary TB means that the infection can progress after the development of an adequate specific immune response. This TB episode can develop in two ways: by inhalation of new bacilli or by reactivation of the primary focus.

Post primary forms

- Most common in adults
- Reactivation / reinfection
- The most frequent site of the infection—the upper lobes of the lungs
- Lymph nodes - less involved
- Para specific symptoms - less likely
- Frequent cavitations
- Bronchogenic spread
- Highly infectious when with cavitations and sputum
- Usually verified with microbiological tests
- TST- not so informative (IGRAs have to be used)

- Bad prognosis if not treated properly
- Chronic forms and relapses in some patients
- Resistant cases more often
- Co-morbidities common
n Side effects from the treatment - more likely
n Complications - quite common
  (haemoptoe, pneumothorax, empyema, fungus, respiratory failure, cor pulmonale chronicum, heart failure, amiloidosis, etc.)

n Residual fibrosis and pneumosclerosis after healing - affect lung function, may be precancerosis

Natural evolution in immunocompetent hosts

50% Dead
25% chronic
25% CURED
If, after interview and clinical examination, there is no evidence of another cardio-pulmonary condition in a patient who presents with cough lasting for more than 3 weeks, pulmonary tuberculosis should be suspected. Bacteriological examinations must then be performed, starting with smear microscopy for acidfast bacilli.

• Pulmonary tuberculosis cannot be diagnosed with certainty by radiography alone.
• If a radiograph is suggestive of tuberculosis, bacteriological examinations must be requested.
• If a radiograph shows cavities but bacteriological examination is negative, the diagnosis of a condition other than active tuberculosis needs to be considered.
Certain radiographic abnormalities are consistent with tuberculosis:

**Nodules** are round shadows (or “densities”) with clearly defined borders; their size varies from a micronodule (less than 3mm in diameter), to a nodule (more than 3 mm and less than 1 cm in diameter), to a round shadow (more than 1 cm in diameter).

**Patchy shadows**, or infiltrations, have irregular borders that are not as clearly defined. They are of varying size, sometimes extending to large parts of the lungs.

**Cavities are the most characteristic sign of tuberculosis.**

A cavity is an area of lucency with a fairly thick wall (more than 1mm). Cavities sometimes contain liquid at the base (liquefied caseous material), evident as an “air fluid level”.
Lesions due to tuberculosis can be unilateral or bilateral.

They are most frequently observed in the upper zones of the radiograph.

The extent of the abnormalities may vary from a minimal lesion (an area less than the size of a single intercostal space), to far advanced lesions, with extensive involvement of both lungs.
Chronic forms of TB

When the tuberculosis has progressed over several months, the destruction of the lung parenchyma and gradual fibrosis lead to retraction of the neighbouring structures: the trachea may be displaced, the hilum may become elevated, the diaphragm may be pulled upward and the cardiac silhouette may change shape and place.
Chest X-ray showing fibrotic infiltrate and cavity with a fungus ball in the upper left lobe.
Standard 1
All persons with otherwise unexplained productive cough lasting two-three weeks or more should be evaluated for tuberculosis.

Standard 2
All patients (adults, adolescents, and children who are capable of producing sputum) suspected of having pulmonary tuberculosis should have at least two sputum specimens submitted for microscopic examination in a quality-assured laboratory. When possible, at least one early morning specimen should be obtained.
Standard 4

All persons with chest radiographic findings suggestive of tuberculosis should have sputum specimens submitted for microbiological examination.

Standard 6

In all children suspected of having intrathoracic (i.e., pulmonary, pleural, and mediastinal or hilar lymph node) tuberculosis, bacteriological confirmation should be sought through examination of sputum (by expectoration, gastric washings, or induced sputum) for smear microscopy and culture. In the event of negative bacteriological results, a diagnosis of tuberculosis should be based on the presence of abnormalities consistent with tuberculosis on chest radiography, a history of exposure to an infectious case, evidence of tuberculosis infection (positive tuberculin skin test or interferon- gamma release assay), and clinical findings suggestive of tuberculosis.

For children suspected of having extrapulmonary tuberculosis, appropriate specimens from the suspected sites of involvement should be obtained for microscopy and for culture and histopathological examination.