Primary Tuberculosis: Clinical Features, Diagnosis & Treatment

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Clinical Features

General constitutional features

• Age
• contact history ±
• Anorexia / Failure to thrive / irritable
• Fever of > 2 weeks / night sweating

S/S specific to system involved

• Lungs: Pl effusion / pneumonia / cavity : wheeze / dry cough
• Spinal TB: stiff spine, spinal hump
• Bone & Joint TB: -Swelling of joints without injury
  -Limp on walking
• TBM: Headache & irritability
• Lymph Node: Swelling/abscess/sinus
Diagnosis: Pr. Tuberculosis

Investigations : apart from routine
- Mantoux Test
- CXR : PA view
- Demonstration of AFB; -in Sputum smear
  -in other specimens
    - Laryngeal swab
    - Gastric aspirate
    - Pus
    - L N aspirate [FNA]
Tuberculin Testing

0.1 ml tuberculin (5 TU) injected just under skin surface of forearm. Pole elevation results. Needle bevel directed upward to prevent too deep penetration.

Test read in 48 to 72 hr. Extent of induration determined by direct observation and palpation; limits marked. Area of erythema has no significance.

Diameter of marked indurated area measured in transverse plane. Reactions over 9 mm in diameter are regarded as positive; those 5 to 9 mm are questionable, and test may be repeated after 7 or more days to obtain booster effect. Less than 5 mm of induration is regarded as negative.
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Initial (Primary) Tuberculous Complex

Initial tuberculosis infection. Small bronchopneumonic infiltrate in r. upper lobe (first infection may be anywhere in lungs) with greatly enlarged hilar and tracheobronchial lymph nodes.

X-ray film showing ill-defined shadow of initial infective focus in lateral upper zone of r. upper lobe with enlarged lymph nodes in hilar and axillary vein areas in a 6-year-old child.

In time, pulmonary focus often heals to a fibrosed, calcified “Ghon lesion” and lymph nodes regress and calcify as shown here.

Calcified “Ghon lesion” in lateral portion of r. lower lobe.

Section of a very inspissated, dried-out focus with fibrous capsule.
Pulmonary Tuberculosis Progressive Pathology

Patch of early active tuberculosis infiltration in r. upper lobe

Progression to cavitation

X-ray film showing early small lesion in lateral portion of 3rd posterior (1st anterior) inter-space; easily missed

Same patient, 4 months later; progression of lesion with cavitation

Histologic section of tubercle beginning to caseate

Caseous pneumonia which may closely simulate any other bacterial pneumonia
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A. Fleck of purulent sputum placed on slide and crushed with another slide; slides drawn apart to make smears

B. Slide flooded with carbol-fuchsin and then heated

C. Slide rinsed with water, decolorized with acid alcohol, and rinsed again

D. Counterstained with methylene blue or malachite green for 30 seconds, rinsed again, and dried

E. Slide of sputum stained with carbol-fuchsin (Ziehl-Neelsen method as above), viewed under oil immersion, showing acid-fast bacilli (M. tuberculosis) as bright red rods

F. M. tuberculosis stained with auramine O which causes acid-fast bacilli to fluoresce (x 200)

G. Auramine O stain of M. kansasii (acid-fast "atypical" mycobacteria) which are much larger than M. tuberculosis (x 200)
Scoring Charts

• Fever/night sweats ------------------------2
• Mal nutrition ---------------------------3
• Family History --------------------------2
• Positive Mx. Test -----------------------3
• LAP: Neck / axilla /groin ---------------3
• Spine deformity -------------------------4
• Joint swelling / bone swelling-----------3
• Unexpected abdominal mass/swelling----- -2
• CNS ; changed temperament /Fits/Coma---- 3

IF TOTAL SCORE IS 7 OR ↑→ TREAT FOR TB
PR. TUBERCULOSIS : TREATMENT

1) Asymptomatic Pr. Complex (infection): 
   chemoprophylaxis: INH (5mg/kg) X 6Months

2) Symptomatic Pr complex: 
   Full chemotherapy treatment

3) Pr. Progressive-Pulmonary / Extra pulmonary: 
   Full chemotherapy treatment
Chemotherapy Treatment (CT)

**DAILY REGIMEN**
(i) 2HRZE / 4 HR
(ii) 2HRZS / 4HR

**INTERMITTENT**
2H$_3$R$_3$Z$_3$E$_3$ / 4H$_3$R$_3$
2H$_3$R$_3$Z$_3$S$_3$ / 4H$_3$R$_3$

[S.M. is usually avoided in young children]
DRUG DOSAGES: mg / Kg

<table>
<thead>
<tr>
<th>DAILY REGIMEN</th>
<th>INTERMITTENT</th>
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<tbody>
<tr>
<td>INH: 5 mg</td>
<td>10-15mg</td>
</tr>
<tr>
<td>RIF: 10</td>
<td>10mg</td>
</tr>
<tr>
<td>ETB: 15 mg</td>
<td>30mg</td>
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<tr>
<td>PZA: 25 mg</td>
<td>35mg</td>
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<tr>
<td>SM: 15 mg</td>
<td>15mg</td>
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_all drugs preferably in single dose_
Miliary Tuberculosis
Innumerable miliary tubercles scattered throughout both lungs and on pleural surface.

Multiple solitary and conglomerate tubercles composed mostly of epithelioid cells with an occasional giant cell of the Langhans type and surrounded by numerous lymphoid cells.
Miliary Tuberculosis

• It is a disseminated form of tuberculosis
• The lesions are throughout the body; mainly appreciated in the lungs
• It is due to hematogenous spread of large number of bacilli
• When the patient's immunity is too weak
Causation

1. **Infant & young children: Pr. Tub**
   - During the stage of hematogenous spread
   - Tuberculous lesion eroding a blood vessel

2. **Adult & older person: Post Pr. Tub**
   - Erosion of blood vessel
   - Surgery on tuberculous organ
Clinical Features

Three types of presentation
1. Classical miliary: (or acute)
2. Cryptic miliary : (chronic)
3. Non reactive miliary
Classic or Ac M.T:

- **Children, adults, infants**
  - Fever; > week, mild-moderate:
  - Malaise
  - Weight loss
  - Post measles / whooping cough
  - Evidence of tuberculosis elsewhere ±
  - Hepato-spleno megaly (less common in adults)
  - Choroid tubercles
  - Meningial irritation ±
Investigations

- **CXR:** Miliary shadows
  - Well defined circular; pin point to 5mm
  - Homogenously distributed all lung fields
  - May not be visible in early stages

- **Mx. Test:** Negative in 50-60% cases

- **Blood counts:** Normal / Low

- **Sputum for AFB:** Negative invariably
2. Cryptic (chronic) Mil. Tub.

- **Age**: usually in elderly
- **Onset**: Very gradual; months
- **Fever**: mild irregular
- **Anemia**: common
Investigations: Cryptic Mil. Tub.

- **CXR**: NAD, usually
- **Blood**: Anemia; +ve
- **Mx. Test**: usually -ve
- **Sputum**: Negative
- **Bone narrow**: may be +ve AFB/tubercles
- **Lung biopsy**: helpful in diagnosis
3. Non reactive Miliary Tub.

- **Age**: Middle, elderly
- **Immunodeficiency**: commonly responsible
- **Rare**
- **Form**: Very acute & fulminant tuberculous
- **Septicemia**: due to spread of large number bacilli through blood stream
- **Patient is extremely ill**
- **High fever**
- **Hepato-spleno megaly**: usual
- **Kidney involvement**: usual
  - ill defined necrotic foci
Investigation : Non reactive Miliary

- **CXR**: may be normal
  - broncho-pneumonia
- **Blood**: anemia; aplastic
  - pan cytopenia
  - Leukemoid reaction
- **Diagnosis**: usually missed / postmortem
Diagnosis of Mil. Tub

1. High index of suspicion
2. Important cause of P.U.O. in our country
3. CXR: may be helpful
4. Sputum for AFB
   - If Negative
   - → Culture
   - Urine culture
5. Bone marrow biopsy
6. Therapeutic assessment with ATD
Differential Diagnosis: Miliary Tub

- Acute viral pneumonia
- Acute histoplasmosis
- Pneumoconiosis; Coal / Beryllium
- Idiopathic hemosiderosis
- Mitral stenosis hemosiderosis
- Histiocytosis X
- Gaucher’s disease in children
- Periarteritis nodosa
Treatment of Mil. Tub.

- Anti Tuberculosis Chemotherapy

**DAILY REGIMEN**          **INTERMITTENT**
(i) 2HRZE /4 HR            2H₃R₃Z₃E₃ / 4H₃R₃
(ii) 2HRZS / 4HR            2H₃R₃Z₃S₃ / 4H₃R₃

- **Steroid**: when very serious / moribund
  1mg /1 Kg  x 6 weeks
  then tapered in next 6 weeks
Thank You