TB Case Presentations

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Case Presentation (A-1)

Patient history
- 17-year-old Hispanic male
- No significant past medical history
- 8 week history of cough
- Associated with:
  - Pleuritic retrosternal chest pain (CP)
  - Dyspnea on exertion (DOE)
  - Fever, night sweats, chills
  - 10-12 lb. weight loss
- Any other questions????

Case Presentation (A-2)

- 2 weeks ago seen at free clinic
- New diagnosis of HIV: CD4: 41, Viral load: 199,000
- TST: Non-reactive, 0mm
- No other significant past medical history
- No medications
- Social history:
  - 1st sexual encounter age 15, last unprotected sex 4mo ago, all sexual partners male
  - No incarcerations/homelessness/known TB contacts

Case Presentation (A-3)

Physical Exam
VS: Temp: 39.4˚ BP: 110/60 P: 108 RR: 26 97% RA

Labs
- CBC WNL
- Chem WNL
- LDH: 243
- ABG: WNL

CXR
- No infiltrate
- L hilar fullness
Case Presentation (A-4)

Question

True or False? Patient does not have pulmonary TB because TST is negative and CXR does not have an infiltrate?

Case Presentation (A-5)

Answer

- HIV infected persons may have normal CXR and still have TB.
- Hilar adenopathy is suggestive of TB
- Active TB patients can be TST negative.
  - HIV (+) or HIV (-).
- AFB sputum smear and culture should be obtained

Case Presentation (A-6)

Hospital course

- Patient admitted to the hospital
- Negative pressure room (AII)
- Sputum smear and culture X 3
- Result: AFB smear negative X 3
- Question - Is there another test that can be ordered to help you with the diagnosis?

Case Presentation (A-7)

Answer: Yes

NAAT: Nucleic acid amplification test
Mycobacterium tuberculosis Direct Test (MFD) or Amplicor

Specimen collection and processing

- AFB Smear
- MGIT (liquid medium, automated system)
- Agar Plate (H37Rv)

No Growth
- Incubate for 6 weeks
- Positive Growth
- Incubate for 4 weeks
- No Growth

NAAT

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Nucleic Acid Amplification (NAA) Tests
Mycobacterial TB Direct Test (MTD)

- Direct, rapid, detection of *Mycobacterium tuberculosis* complex (rRNA)
  - Patients suspected of TB
  - Takes about 4 to 5 hours
  - Approved for respiratory specimens only
    - Smear positive and smear negative
    - Non-respiratory specimen (validated by labs)
    - Can detect fewer than 10 organisms
  - Does not distinguish live vs dead organism

*MMWR* July 7, 2000

**CDC Guidelines - 2009**

**Nucleic Acid Amplification Test**

- Collect specimen for AFB, culture, & NAA
- Interpret results with AFB smear

<table>
<thead>
<tr>
<th>NAA</th>
<th>AFB</th>
<th>Recommend</th>
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<tbody>
<tr>
<td>+</td>
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<td>Start treatment. PPV &gt;95% NAA in AFB+ cases</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
<td>Repeat NAA test. Presume TB if &gt;=2 NAA (+)</td>
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<tr>
<td>-</td>
<td>+</td>
<td>Presume nontuberculous mycobacteria (NTM)</td>
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<tr>
<td>-</td>
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<td>Use clinical judgment. NAA sensitivity 50-80% in detection AFB (-) Culture (+) pulmonary TB</td>
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*MMWR 2009*

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**Case Presentation (A-8)**

Hospital Course:

- Treated empirically with levofloxacin: symptoms improved
- Working diagnosis on discharge
  - mediastinal lymphadenopathy, r/o lymphoma vs. mycobacterial disease
- Discharged with levofloxacin, PCP and MAC prophylaxis

**Case Presentation (A-9)**

- Seen in HIV clinic 1 week after hospital discharge
- Fever, chills, and cough recurred
- Sputum AFB culture: still pending
- Concerned the patient may have TB
- Your health department has lost $$ TB funding and you are short on staff for DOT
Case Presentation (A-10)

Question

Which initial regimen would you start?

a. INH, Rifampin, EMB, and PZA (daily)

b. INH, Rifampin, EMB, and PZA (BIW)

c. Refill Levofloxacin – he got better on it!

d. Has LTBI and can treat with INH and Rifapentine (once weekly)

e. Wait for culture to be positive before starting

Case Presentation (A-11)

Day 20

- AFB culture - positive for \textit{M. tuberculosis}
- All isolates: pan-susceptible to first line drugs

Day 25 - Enlarging lymph node

Admitted

- Axillary lymph node biopsy
- Continued on TB medications
- Symptoms improved \rightarrow\text{Discharged}

TB Treatment - Culture-Positive TB

(Rated: \textit{AI} in HIV-negative, \textit{AII} in HIV-positive patients)

\textbf{Initial Phase}

2 months - INH, RIF, PZA, EMB daily (56 doses, 8 weeks)
- INH, RIF, PZA, EMB 5x/wk (40 doses, 8 weeks)

- Do NOT use twice-weekly therapy for HIV + with low CD4 < 100 cells/mm$^3$
- Avoid use of Rifapentine for HIV-TB Co-infected

Case Presentation (A-12)

\textit{Acid Fast Smear of Axillary Lymph Node}
Case Presentation (A-13)

Day 60 - HIV Clinic
- HIV viral load 199,000
- HAART initiated:
  - Triple nucleoside regimen
  - d4T, 3TC, abacavir

Traveled to Puerto Rico for 2 weeks to visit family

Case Presentation (A-14)

Day 99
Presented to ER 39 days after starting HAART
CC: Increasing SOB & diaphoresis
Vitals: T 104.3°F
RR 40 BP 84/52
Physical exam:
Distended neck veins
Decrease heart tones

Case Presentation (A-15)

PA VIEWS OF THE CHEST:
Increasing Cardiothoracic Ratio & Superior Mediastinal Widening

Initial admission = 42%
2 months later = 51%

Case Presentation (A-16)

Interval Development of Large Pericardial Effusion

Initial Diagnosis
2 months later
Pericardial biopsy and fluid were all negative.

Case Presentation (A-17)
Pericardial Biopsy - Thickened Pericardium with Acute and Chronic Hemorrhagic Inflammation

Case Presentation (A-18)
Question

- Which of the following is the most likely explanation for his current symptoms?

  a. He has developed multi-drug resistant TB
  b. He has developed PCP (Pneumocystis jiroveci)
  c. He is experiencing side effects to his anti-TB medication
  d. He has developed a “paradoxical reaction” to his anti-TB and HAART
Immune Restoration Inflammatory Syndrome

- Occurs in 8-43% of co-infected
- Most patients have advanced HIV disease
  - median CD4 count of 35 cells/ mm³
  - median viral load > 500,000 copies/ml
  - Usually severe TB disease with high pathogen burden
- Median 15 days after starting ARV therapy (<30 d)
- Most within 90 days of starting TB Rx

Diagnosis of exclusion:
- Differential diagnosis include:
  - Treatment failure, adherence, drug toxicity, new infection

Management of reactions:
- NSAIDS if mild,
- Prednisone if severe

Case Presentation (A-20)
Response to Corticosteroids:
Resolution of Pericardial Effusion

Key Points: HIV-TB Co-infection

- HIV and TB enhance each other's pathogenicity, resulting in dual epidemic
  - All TB patients should be tested for HIV and HIV patients checked for TB
- LTBI progression to TB is a significant risk
- Diagnosis is more difficult
  - Symptoms may be minimal, atypical or absent
  - Presentations are often unusual
- Treatment of TB and HIV is more complicated
  - Drug toxicities/interactions are frequent, drug resistance
- IRIS may mimic treatment failure or new infection
Case Presentation (B-1)

- 41 year old man presents to the ER at Charity with headache for 3 days
- No relief with over the counter acetaminophen
- Nausea, mild neck stiffness
- No vomiting, no blurry vision, no mental status changes or problems speaking no shortness of breath, no cough
- PMH: Sexual transmitted infections
- Social History: No tobacco, alcohol, or illicit drug use

Case Presentation (B-2)

- Physical Examination (PE)
- AF, VSS (Afebrile, vital signs stable)
- PE: WNL (within normal limits)
- A&O X 3 (alert and oriented) cognition is normal
- Cranial nerves: II - XII grossly intact
- Fundoscopy: mildly blurry disc margins, no venous pulse appreciated
- Motor: 5/5 strength upper and lower extremities
- Sensory: intact
- Cerebellar function: intact
- DTR's: 2+ bilaterally

Case Presentation (B-3)

- Laboratory
  - WBC: 4.1
    - S73 B84 L12 M10 E1
  - Hgb: 13.8
  - Hct: 41
  - Plt: 246
- CXR
  - Bilateral reticulonodular pattern with upper zone predominance.
- Differential diagnosis includes infectious process (TB is a consideration) versus neoplastic process. Bilateral hilar predominance.
Case Presentation (B-4)
CT
MRI
Cerebellar vermian mass (1.8 cm) with associated vasogenic edema
Cerebellar mass lesion with two predominant ring enhancing components.
Differential diagnosis:
Immunocompetent: hemangioblastoma, astrocytoma, met malignancy
Immunocompromise: toxoplasmosis, lymphoma

Case Presentation (B-5)
Chest CT
HIV: Reactive
CD4: 152, 25.3%, ratio 0.5
TST: Negative

Case Presentation (B-6)
Hospital Course - Microbiology results
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**Case Presentation (B-8)**

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**Case Presentation (C-1)**

- 40 years old, HIV (+), 2 months pregnant
- Boyfriend just diagnosed with active pulmonary TB
- She does not have any symptoms of active TB

**Questions**

Appropriate management would include:

- A. A tuberculin skin test - (on a pregnant woman)?
- B. An anergy panel?
- C. A chest x-ray – (wait until after first trimester)?
- D. Treatment for LTBI?

**Case Presentation (C-2)**

- A. Skin testing on pregnant or nursing woman is safe
- B. Anergy testing no longer routinely recommended
  - Cannot r/o diagnosis based on negative skin test
  - Overwhelming TB disease, severe or febrile illness, viral infection
  - Live-virus vaccinations (MMR)
- C. CXR - Shielding consistent with safety guidelines even during first trimester of pregnancy
- D. HIV infected persons and children <4 years old exposed to an infectious case of TB, should be treated with INH after active TB has been r/o

**Case Presentation (C-3)**

- Skin test results - positive at 5mm
- No symptoms and CXR is normal

Appropriate management would include which of the following regimens?

- a. 2 months of PZA and Rifampin
- b. 4 months of Rifamycin
- c. 6 months of INH
- d. 9 months of INH
Case Presentation (C-4)

Answer: d

- Treatment of latent TB infection for HIV positive and negative is the same
- Recommend 9 months of INH
- Acceptable alternative
  - 4 months of Rifampin
  - 6 months INH
- PZA and RIF is no longer recommended due to hepatotoxicity

Update: adverse event data and revised ATS and CDC recommendations against the use of RIF and PZA for treatment of LTBI-United States, 2003.