TB and HIV

- TB/HIV Pathogenesis
- Importance of Screening
- Clinical Presentations of HIV-related TB
- Clinical Management of TB and HIV Co-infection
TB/HIV

Two Diseases

One Patient
TB: A Growing Concern

Approximately 1/3 of the world population is infected with TB.

TB is one of the leading causes of death in people with HIV, particularly in low-income countries.
Progression

TB increases HIV progression
Dually infected persons often have very high HIV viral loads
Immuno-suppression progresses more quickly, and survival may be shorter despite successful treatment of TB
Persons who were co-infected have a shorter survival period than persons with HIV who never had TB disease
The Effects of Immune Suppression on TB Progression

HIV+ person has a greater risk of reactivation of latent TB infection (LTBI)

HIV+ person is more likely to progress to TB disease following infection

HIV+ person has a high risk of becoming sick again after treatment

HIV+ person with LTBI has a 5-15% annual risk of developing active TB (versus 10% lifetime risk among HIV-negative persons)
Highly Active Anti-retroviral Therapy (HAART) alone can reduce the risk of latent TB infection progression to active TB disease by as much as 80%–92%.
In areas with a high prevalence of HIV infection in the general population where tuberculosis and HIV infection are likely to co-exist, HIV counseling and testing is indicated for all tuberculosis patients as part of their routine management.

In areas with lower prevalence rates of HIV, HIV counseling and testing is indicated for TB patients with symptoms and/or signs of HIV-related conditions and in tuberculosis patients having a history suggestive of high risk of HIV.
TB Screening Questionnaire

Has the patient had a cough for ≥3 weeks? \(^1\)
Has the patient had night sweats for ≥3 weeks \(^2\)
Has the patient lost ≥3 kg in the past four months? \(^3\)
Has the patient had fever for ≥3 weeks? \(^4\)
Has the patient had recent contact with another person with active TB? \(^5\)

TB Screening (3)

→ All patients suspected or known to be HIV-seropositive and those who have AIDS should be examined for TB, particularly when there is a cough.
Clinical Presentation of HIV-related TB

CD4 counts >350

Disease usually limited to the lungs

Often presents like TB in HIV-uninfected persons

“typical” chest X-ray findings with upper lobe infiltrates with or without cavities
Clinical Presentation of HIV-related TB (2)

CD4 counts <50-100

- Extrapulmonary disease is common
- Disseminated disease with high fevers and rapid progression is seen
- Chest X-ray findings often look like “primary TB” with adenopathy, effusions, interstitial or miliary
Pulmonary TB in Early and Late HIV Infection

<table>
<thead>
<tr>
<th>Features of pulmonary TB</th>
<th>Early Stage HIV infection</th>
<th>Late Stage HIV infection</th>
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<tbody>
<tr>
<td><strong>Clinical picture</strong></td>
<td>often resembles post-primary PTB</td>
<td>often resembles primary PTB</td>
</tr>
<tr>
<td><strong>Sputum smear result</strong></td>
<td>often positive</td>
<td>more likely to be negative</td>
</tr>
<tr>
<td><strong>Chest X-ray appearance</strong></td>
<td>upper lobe infiltrates with or without cavitation</td>
<td>infiltrates any lung zone, no cavitation; miliary; normal</td>
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Smear-negative Pulmonary TB

TB sputum culture is the gold standard for TB diagnosis.

If sputum smears are negative:
- Obtain sputum culture if available.
- Culture will improve the quality of care and assist the confirmation of the diagnosis.
- A CXR can help with earlier diagnosis, i.e., if findings show intrathoracic adenopathy, miliary changes, or upper lobe infiltrates.
Diagnosing TB in Persons with HIV

In HIV-positive or suspect patients:

- 3 sputum samples for microscopy are indicated for any symptoms of TB regardless of duration or sputum characteristics.
- Fever and weight loss can be important symptoms.
- If sputum smear is +, a chest X-ray is not required to confirm the diagnosis PTB.
Post - Primary Tuberculosis

- Air space consolidation
- Cavitation, cavitary nodule
- Upper lung zone distribution
- Endobronchial pattern of spread
Post – Primary TB : Cavitation
Post – Primary TB: Consolidation
Primary Pulmonary Tuberculosis

**Distribution**: Slight upper lobe predominance but any lobe can be involved

Intrathoracic adenopathy, hilar and paratracheal

Cavitation is uncommon (<10%)

Miliary pattern
HIV & TB: Adenitis
1° TB : Adenitis
Understand the Differential Diagnosis of Smear-Negative PTB in HIV Patients

Always reassess the patient for conditions that may be mistaken for PTB, including non-infectious conditions.

Acute bacterial pneumonia is common in HIV patients (short symptom history usually differentiates pneumonia from PTB).

Consider PCP:

In a seriously ill patient with dry cough, severe dyspnoea and bilateral diffuse infiltrates.

Concomitant treatment of TB and PCP may be
Extra-pulmonary TB

More strongly HIV-related than PTB

If combined extra-pulmonary TB (EPTB) and PTB, HIV infection is even more likely

In HIV, EPTB is WHO Clinical Stage 4

Patients with HIV and EPTB are at risk for disseminated disease and rapid clinical deterioration
Extra-pulmonary TB (2)

If a patient has EPTB, look also for PTB with sputum smears - many patients with EPTB, however, do not have coexisting PTB

Forms of EPTB commonly seen in patients with HIV-associated TB include:

- Lymphadenopathy
- Pleural effusion
- Abdominal
- Pericardial
- Miliary TB
- Meningitis
Extra-pulmonary TB (3)

Presentation

Constitutional symptoms (fever, night sweats, weight loss)

Local features related to the site of the disease

Diagnostic tools

X-rays, ultrasound, biopsy

Diagnosis may be presumptive provided other conditions are excluded

Note: disseminated TB may have no localizing signs, may present with anemia, or low
TB Treatment

- Anti-TB regimens in an HIV-positive patient follow the same principles as in HIV-negative patients.
TB Treatment (2)

Cautions:

Extensive disease

Culture positive at 2 months

Daily during initial phase then thrice weekly or daily
All patients with tuberculosis and HIV infection should be evaluated to determine if antiretroviral therapy (ART) is indicated during the course of treatment for tuberculosis. Appropriate arrangements for access to antiretroviral drugs should be made for patients who meet indications for treatment.
Given the complexity of co-administration of antituberculosis treatment and ART, consultation with a physician who is expert in this area is recommended before initiation of concurrent treatment for TB and HIV infection, regardless of which disease appeared first. However, initiation of treatment for TB should not be delayed. Patients with TB and HIV infection should also receive cotrimoxazole as prophylaxis for other infections.
Summary

TB increases HIV progression
HIV increases TB progression
Standard TB treatment usually cures TB in TB/HIV
Despite successful TB treatment, mortality among TB/HIV patients remains high
All HIV/TB patients qualify for cotrimoxazole prophylaxis and it improves survival
Summary (2)

- HAART for eligible patients greatly improves survival
- Different HAART regimens may be required because of drug interactions with rifampicin
- Programmatic synergy between the TB and HIV programs is needed to improve treatment of both conditions and will reduce disease and death
Thank you