

PULMONARY TUBERCULOSIS (TB) IN PREGNANCY

Background¹

1. Infectious bacterial disease caused by *Mycobacterium tuberculosis*
2. Most commonly affects the lungs, but can affect the brain, spine, kidneys and other organs
3. Untreated tuberculosis (TB) represents a greater hazard to a pregnant woman and her fetus than does treatment
4. Patient on treatment for latent TB (LTBI) who becomes pregnant should continue therapy

Pathophysiology

1. Pathogenesis of tuberculosis infection and disease in pregnant women is similar to that in nonpregnant women²
2. Transmitted by inhaling aerosolized, *M. tuberculosis* containing, respiratory droplets expelled from infected individuals through coughing, sneezing or speaking³
3. Pregnancy does not increase the risk of TB, so the epidemiology of TB in pregnancy is a reflection of the general disease incidence: 3.6 cases per 100,000 population¹
4. Pregnant women have increased risk if⁴ :
 - foreign born
 - a history of recent *M. tuberculosis* infection (within the past 2 years) or inadequately treated tuberculosis
 - close contact with infected persons
 - injection drug use or other locally identified high-risk substances (e.g., crack cocaine)
 - residents/employees of high-risk congregate settings (e.g., correctional institutions, nursing homes, mental institutions or shelters)
 - prolonged corticosteroid therapy (e.g., prednisone ≥ 15 mg per day for ≥ 1 month)
5. TB does increase the rate of pregnancy complications⁵:
 - Preeclampsia
 - Vaginal bleeding
 - Early pregnancy loss
 - Preterm labor
 - Low birth weight

Diagnostics

1. Screening not routinely recommended; screen pregnant women for LTBI only if high risk of progression to active disease
2. Diagnostic approach for active TB in pregnancy: same as for nonpregnant women
3. Also see TB
4. Clinical presentation in pregnancy similar to that for nonpregnant women, but may be more insidious

5. Classic presentation: fever, cough, night sweats, suprapubic tenderness, anorexia, weight loss, general malaise, and weakness³
6. PE findings can be normal; however, can include fever, vaginal bleeding, decreased air entry, or chest pain reproduced on palpation
7. Tuberculin skin test (TST) is standard tool to identify patients with LTBI. 0.1mL or 5 tuberculin units injected via intradermal technique⁶.
 - Positive reading in non-immunocompromised individuals: >15mm.
8. TST false negatives:
 - In patients with sarcoidosis, Hodgkins lymphoma, malnutrition, or active tuberculosis disease
 - In patients immunized with BCG (Bacillus Calmette-Guerin)
9. Interferon gamma release assays (IGRA):
 - Not evaluated in pregnancy
 - Not recommended routinely
 - Viable option if PPD negative and high clinical suspicion, risk factors for false negative PPD or unlikely to return for TST reading¹⁶
10. Chest x-ray if PPD positive to rule out active tuberculosis²
11. Sputum culture testing for AFB: series of at least three single specimens collected in 8 to 24 hour intervals (with at least one early morning specimen)⁷
12. Bronchoscopy with bronchoalveolar lavage reserved for unsuccessful attempts to obtain sputum samples, or negative sputum studies and high clinical suspicion⁸

Differential Diagnosis

1. Bacterial Pneumonia⁹
2. Lung carcinoma¹⁰
3. Lymphoma¹¹
4. Sarcoidosis¹²

Therapeutics

1. Latent TB Infection²: If patient with LTBI has high risk of progression to active disease (recent TB infection, HIV, immunosuppression), then treatment recommended:
 - Isoniazid 300mg per day with 25mg Pyridoxine per day. Pregnancy Category C
 - Alternative:
 - Rifampin 10mg/kg (maximum 600mg) per day in patients not taking INH. Pregnancy Category C
 - Ethambutol 15mg/kg per day. Pregnancy Category C
2. Active Pulmonary TB²
 - Isoniazid 5mg/kg per day (300mg). After 2 months: 15mg/kg, twice a week. Take with Pyridoxine 25mg per day
 - Rifampin 10mg/kg (maximum 600 mg) per day OR 15mg/kg 3 times a week

- Ethambutol 15mg/kg per day. 30mg/kg per day for meningeal TB 30-50mg/kg 2-3 times a week.
- Pyrazinamide 25mg/kg (maximum 2gm) per day OR 50mg/kg 3 times a week
- AVOID in pregnancy: streptomycin, kanamycin, amikacin, capreomycin

Follow-Up

1. Must report to state Department of Health¹
2. Monthly clinical appointments are mandatory in patients taking isoniazid for latent tuberculosis infection³
3. Directly observed therapy (DOT): used by public health departments to ensure compliance; health worker watches patient swallow TB medication every day. DOT may help to improve cure rates¹
4. Monitoring for hepatitis is especially important for pregnant and postpartum women; pre-treatment liver transaminases and bilirubin function tests followed by monthly liver enzyme testing; patients should be instructed to call immediately if any symptoms or signs of hepatitis occur¹³

Prognosis²

1. Pregnancy not a risk factor for TB
2. Pregnancy has not been shown to increase likelihood of progression from latent infection to active disease.
3. Maternal infection can lead to congenital or neonatal infection.

Prevention¹⁴

1. Minimize person-to-person contact with those who have active TB
2. Covering mouth while coughing may decrease spread
3. Mask filters, ultraviolet light sterilization of air, and negative pressure ventilation in rooms may decrease spread
4. If a mother has established or suspected active pulmonary TB at time of delivery, she and infant should be separated until both have been fully evaluated¹⁵

Patient Education¹

1. Pregnant women who are being treated for drug-resistant TB should receive counseling concerning risk to the fetus because of the known and unknown risks of second-line antituberculosis drugs
2. Breastfeeding:
 - Not contraindicated if mother on treatment for LTBI or active TB with first line agents.
 - Infants exposed to isoniazid (through breast milk or directly) should receive pyridoxine.
 - Breastfeeding contraindicated if mother taking rifabutin or fluoroquinolones
3. Culturally appropriate patient education materials cover six topics —TB disease, TB infection, tuberculin skin testing, TB contact investigation, TB and HIV coinfection, and TB medicine.

- Materials are available in English (low literacy), Spanish, and Tagalog languages.

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