Module 7
MATERNAL AND INFANT TB
Maternal TB

TB in pregnancy is common...
  • in peri-natal period
  • especially in HIV-infected women

...and is associated with:
  • increased maternal mortality
  • LBW babies
  • increased risk of TB transmission to the infant
  • increased risk of HIV transmission to the infant
  • increased infant mortality

Adhikari M. Seminars Fetal Neonatal Medicine 2009

**Maternal TB and TB/HIV**

**Women of childbearing age have the highest burden of TB**

**TB is a leading cause of maternal mortality**

<table>
<thead>
<tr>
<th></th>
<th>Maternal mortality (per 100,000)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
</tr>
<tr>
<td>HIV+</td>
<td>323.3</td>
</tr>
<tr>
<td>HIV-</td>
<td>148.6</td>
</tr>
</tbody>
</table>

DeLuca JAIDS 2009

Khan AIDS 2001
Infants born to HIV-infected mothers have higher rates of TB

- HIV exposed: 10x increased risk TB
- HIV infected: 30x increased risk TB

Infant Tuberculosis (per 100,000)  RR

<table>
<thead>
<tr>
<th></th>
<th>Infant Tuberculosis (per 100,000)</th>
<th>RR</th>
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<tbody>
<tr>
<td>HIV+</td>
<td>1595.5</td>
<td>24.2</td>
</tr>
<tr>
<td>HIV-</td>
<td>65.9</td>
<td></td>
</tr>
</tbody>
</table>

Mukadi Y et al, AIDS 1997

Hesseling A et al, Clin Infect Dis 2009
Three I’s for TB control

1. Intensified Case Finding
   Symptom screening for TB should be routine in pregnant women
   Gupta A et al Clin Infect Dis 2011

2. INH Prevention Treatment (IPT)
   Newborns of mother with TB that do not have TB disease should delay BCG and receive IPT for at least 6 months

3. Infection Control
Infection control

• Infants at increased risk of exposure to TB and severe disease – especially HIV-exposed infants

• Infants often accompany mother to access health services including health-care facilities also attended by adults such as maternal health or HIV clinic

• NTP has infection control guidelines emphasising importance of simple and feasible measures to optimize patient flow and air flow to reduce the risk of transmission
...and a fourth I

1) Intensified Case Finding
2) INH Prevention Treatment (IPT)
3) Infection Control

PLUS

4) Integrated Management
1) increased screening of TB during pregnancy and the postnatal period for mother and baby

2) PMTCT services to reduce transmission of HIV to infants

3) services to ensure that mother and infant receive HAART

4) interaction between the PMTCT and child health programmes
The 4th I: Integrating Maternal and Infant TB/HIV Prevention and Control

PMTCT

EPI

IPT

Intensified Case Finding

Infection Control

Slide courtesy of Lisa Cranmer
Approach to newborn of mother with TB

Assess newborn and
• if clinically unwell e.g. neonatal “sepsis” or pneumonia or evidence of congenital infection, then consider TB disease (and TB treatment)

• if well, provide IPT for 6 months and follow-up

Continue breast feeding

Delay BCG until IPT complete

Infection control measures to prevent transmission from mother in newborn care facility
Integrated management of mother with TB/HIV and infant

Important and challenging - many issues to consider – What are the issues?
Integrated management of mother with TB/HIV and infant

Important and challenging - many issues to consider:

Screening for TB in mother and baby – and treating

ART – mother, PMTCT, infant if HIV-infected

IPT – for mother or infant

CPT – for mother and infant

BCG – withhold if HIV-infected infant
    delay if infant HIV-uninfected and on IPT

EPI schedule

Infection control
Integrated management of mother with TB/HIV and infant

Important and challenging - many issues to consider:
Screening for TB in mother and baby – and treating

ART – mother, PMTCT, infant if HIV-infected

IPT and CPT – for mother or infant

BCG – withhold if HIV-infected infant
      delay if infant HIV-uninfected and on IPT

EPI schedule

Infection control

..and even more challenging if mother has MDR or XDR TB

? choice of TB therapy or preventive therapy
? should baby be separated
Current Impact of PMTCT on TB/HIV

• Maternal HAART
  – Decreases maternal active TB and HIV progression

• Prevention of infant HIV infection
  – Reduces risk of TB in infant

• Provision of early HAART for infected infants
  – Reduces risk of TB in infant
Setting:
- 90% uptake of antenatal HIV testing – HIV prevalence 30%
- The posttest counseling session of PMTCT program screen HIV-infected pregnant women for TB.

Results:
- 370 HIV-infected pregnant women screened for symptoms of active TB by lay counselors.
- If symptomatic, referred to nurses who investigated further.
- Eight women were found to have previously undiagnosed, smear-negative, culture-confirmed TB (2160/100,000).
- Mean CD4 count in those with active TB compared to those without TB was 276 x 10(6) cells per liter vs 447 x 10(6) cells per liter (P = 0.051).
- Symptoms most associated with active TB were hemoptysis and fever.
Implications for EPI

Altered vaccine schedule based on infant TB exposure and HIV status

– If infant TB exposed $\rightarrow$ BCG after IPT

– No BCG vaccination for HIV-infected infants
Maternal TB/HIV and BCG

- HIV infected infants are at increased risk of disseminated BCG disease which is often fatal.
- PMTCT and early ART of HIV-infected markedly reduces the risk of BCG disease.
- BCG IRIS is common in infants (3-6 months) when early ART is commenced but is usually not fatal.
The 4th I: Integration Activities

**Intensified Case Finding**
- TB symptom screen at VCT
- Intensified TB screen for all HIV+ mothers

**INH Preventive Therapy**
- IPT for mothers at PMTCT enrollment
- IPT for TB exposed infants

**Infection Control**
- TB contact screen
- TB contact screen
- TB contact screen

**Antenatal**
- TB symptom screen for mothers

**Delivery**
- TB symptom screen for mothers

**Postpartum**
- TB symptom screen for mothers + infants
Exercise: discuss how and where an integrated approach might be provided

Screening for TB in mother and baby – and treating

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EPI schedule

Infection control