Mothers and Mycobacteria: The intersection between tuberculosis and maternal and neonatal health

Charlotte Colvin, PhD
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Significant declines in maternal mortality over the last two decades

Non-obstetric causes, including infectious diseases, are now responsible for 28% of maternal mortality worldwide.

Important gaps in our understanding of TB and pregnancy
Clinical implications: TB and pregnancy

- Mixed evidence on pregnancy as a risk factor for TB disease
- Untreated TB in pregnant women results in unfavorable outcomes including:
  - IUGR, prematurity, low birth weight, peri-natal death
  - TB disease in the mother
  - TB infection and disease in the infant
    - High risk of transmission from mother to infant
- Outcomes generally worse in women who are co-infected with HIV
- TB disease in HIV+ pregnant women associated with increased risk of HIV transmission to infant
What do we know about the burden of TB disease among pregnant women?

• Unlike other infectious diseases (ex, HIV/AIDS, malaria), the burden of TB disease among pregnant women is not well understood
• Currently, TB notifications are not disaggregated by pregnancy status
• We have little data to target efforts aimed at reducing TB burden in this important population
• But we do have good opportunities to reach pregnant women with TB diagnosis and treatment services
## Estimated TB Cases among pregnant women, 2013

<table>
<thead>
<tr>
<th>Region</th>
<th>Estimate</th>
<th>95% UR</th>
<th>Rate per 1000 pregnant women</th>
<th>Percentage of global burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global estimate</td>
<td>216,500</td>
<td>192,100-247,000</td>
<td>2·1 (1·8-2·4)</td>
<td>-</td>
</tr>
<tr>
<td>AFRO</td>
<td>89,400</td>
<td>74,200-110,500</td>
<td>3·6 (3·0-4·5)</td>
<td>41%</td>
</tr>
<tr>
<td>SEARO</td>
<td>67,500</td>
<td>52,000- 87,100</td>
<td>2·4 (1·9-3·1)</td>
<td>31%</td>
</tr>
<tr>
<td>EMRO</td>
<td>28,500</td>
<td>19,700- 41,900</td>
<td>2·3 (1·6-3·4)</td>
<td>13%</td>
</tr>
<tr>
<td>WPRO</td>
<td>21,400</td>
<td>19,400- 23,700</td>
<td>1·1 (1·0-1·2)</td>
<td>10%</td>
</tr>
<tr>
<td>AMRO</td>
<td>4,800</td>
<td>3,900- 6,000</td>
<td>0·4 (0·3-0·5)</td>
<td>2%</td>
</tr>
<tr>
<td>EURO</td>
<td>4,900</td>
<td>3,800- 6,300</td>
<td>0·6 (0·5-0·8)</td>
<td>2%</td>
</tr>
</tbody>
</table>

*WHO designations used for regional categories*

From Sugarman et al. *Lancet Global Health* 2:12
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<thead>
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<th>Country</th>
<th>Mean</th>
<th>95% UR</th>
<th>Percentage of global burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>44,513</td>
<td>30532 -61967</td>
<td>24.6</td>
</tr>
<tr>
<td>DR Congo</td>
<td>16,157</td>
<td>8652-26915</td>
<td>6.1</td>
</tr>
<tr>
<td>China</td>
<td>9,464</td>
<td>8066 -11088</td>
<td>5.8</td>
</tr>
<tr>
<td>Pakistan</td>
<td>14,789</td>
<td>7210 -26330</td>
<td>5.3</td>
</tr>
<tr>
<td>Nigeria</td>
<td>10,861</td>
<td>2997 -27712</td>
<td>4.6</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>8,129</td>
<td>4116 -14274</td>
<td>4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>9,478</td>
<td>4684 -16358</td>
<td>4</td>
</tr>
<tr>
<td>Philippines</td>
<td>6,551</td>
<td>5715 -7494</td>
<td>3.8</td>
</tr>
<tr>
<td>South Africa</td>
<td>8,412</td>
<td>4363 -14346</td>
<td>3.2</td>
</tr>
</tbody>
</table>
TB screening, diagnosis and treatment for pregnant women

- WHO symptom screen is useful for excluding TB
- Isoniazid preventive therapy (IPT) for HIV+ pregnant women and those at risk of progressing to active TB disease
- Clinical diagnosis is challenging due to similarity between TB symptoms and physiological response to pregnancy
- Recommended diagnostic tests include smear microscopy, culture, molecular methods (e.g. Xpert®MTB/RIF), shielded chest X ray
- TB treatment in pregnant women is the same as for non-pregnant women
  - HIV co-infected pregnant women on ART
  - Second line therapy for drug resistant TB
Policy and program recommendations

• Ensure TB screening, diagnosis and treatment services for pregnant women and infants
• Build on PMTCT platforms to integrate TB services for HIV+ pregnant women
• Include TB services in IMCI, particularly for infants who present with acute pneumonia.
• Address needs of pregnant and breastfeeding women and infants in research
  – Point of care testing is particularly important for early TB diagnosis among pregnant women
TB Services in ANC and PMTCT platforms: What do we know?

Integration of tuberculosis and prevention of mother-to-child transmission of HIV programmes in South Africa

J. Uwimana, *† D. Jackson*

*School of Public Health, University of the Western Cape, Bellville, Cape Town, South Africa; †School of Public Health, National University of Rwanda, Kigali, Rwanda

- Multi method study to describe level of integration and identify barriers
- 10 clinics in rural area of KwaZulu Natal with high TB and HIV prevalence, 150 ANC clients
- Just over half (56%) screened for TB; of these, 27% submitted sputum sample; ultimately, 2 were diagnosed with TB
- Key informants at every level noted lack of integration, TB screening and IPT are particularly absent in the PMTCT setting
- Health system weaknesses (ex, high staff turnover, limited information systems) and lack of leadership identified as main issues to be addressed.
Moving forward

• Clinical significance of TB and pregnancy is clear
• A better understanding of the burden of TB among pregnancy women at global and country level can help target efforts
• Efforts to integrate TB services with maternity care are mixed in terms of yield, feasibility
• Role for improved TB diagnosis and point of care test – may ease some difficulties of integrating services