Prevention of TB in children

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• The natural history of disease in children indicates that more than 95% of children who develop TB do so within 12 months after infection
Studies of child contacts in African communities

• One-third to two-thirds of child household contacts of TB cases have evidence of TB infection i.e. TST positive

• Incidence of TB disease among household contacts is very high – reported as >1,000 cases/100,000 population

• Likelihood of infection is related to closeness/proximity of contact to and sputum smear positivity of index case

• Risk of infection greatest when the index case is the child’s carer e.g. mother, grandmother

• HIV-infected children are at increased risk of exposure to TB
Proportion of children with TB infection (positive TST) by degree of smear positivity of the source case

Kenyon TA et al, Int J Tuberc Lung Dis 2002
Importance of Child Contact Screening

• The prevalence of TB infection is high among child contacts
  – Child contact screening identifies asymptomatic child TB contact for IPT
  – Early identification and treatment of children with active TB disease

• Early case finding and treatment of infectious TB cases will reduce the burden of child TB

• Child household TB contacts had significant increase risk of all-cause mortality compared to children living in non-TB households in same community
Management of child contacts

List close contacts find out their ages, HIV status and if the contacts have any symptoms suggestive of Tuberculosis

Checklist of main symptoms

- Persistent cough for more than 2 weeks
- Weight loss or failure to gain weight
- Persistent fever for more than 1 week and/or night sweats
- Fatigue, reduced playfulness, less active
- Enlarged cervical LN(S)
Growth Monitoring Chart

Check weight, record weight and compare to previous weights

Growth faltering or failure to thrive

Weight loss
The Symptomatic Child

Evaluate for TB

1. If TB, treat as per guidelines

1. If symptomatic but not TB: Re-evaluate symptoms and manage appropriately
Contact Tracing Approaches

• Facility Based Approach

• Community Based Approach (recommended)
Isonizide Preventive Therapy (IPT)

• IPT is given to high TB risk children who have no signs symptoms for TB disease

• IPT reduces the risk of TB disease by around 60% among infected contacts of all ages

• Large observational studies suggest that the efficacy may be higher (80-90%) in child contacts
Risk of TB disease following infection by age

Which child gets IPT

- All children aged under 5 years who have been exposed to a case of infectious TB irrespective of their HIV status
- Among children living with HIV who are less than 12 months of age, only those children who have contact with a TB case and who are evaluated for TB (using investigations) if the evaluation shows no TB disease.
- Children living with HIV who are more than 12 months of age and who are unlikely to have active TB on symptom-based screening, and have no contact with a TB case
- Follow up of a child on IPT is monthly. If TB disease develops, stop IPT and treat for TB.
- Malnourished and HIV positive children should also be given Vitamin B6 at 25mg daily
- INH preventive therapy should NOT be given to children exposed to an adult with proven MDR/XDR TB. The children should instead be followed up for signs of active TB disease and managed appropriately

NB: Clinical assessment is sufficient to decide whether the contact is well or symptomatic for TB, where TST and CXR are not available
# IPT dosing schedule

TB disease must be ruled out before initiating IPT

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Daily Dose in mg</th>
<th>Number of 100 mg, INH tablets</th>
<th>Number of 300 mg (Adult) tablets</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>50</td>
<td>½</td>
<td>-</td>
</tr>
<tr>
<td>5.1 – 9.9</td>
<td>100</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>10-13.9</td>
<td>150</td>
<td>1½</td>
<td>½</td>
</tr>
<tr>
<td>14-19.9</td>
<td>200</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>20-24.9</td>
<td>250</td>
<td>2½</td>
<td>-</td>
</tr>
<tr>
<td>&gt;25 and adults</td>
<td>300</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

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Follow up of child on IPT

• Give IPT for 6 months
• During monthly visits
  – evaluate for TB symptoms
  – Conduct Adherence counseling
  – Monitor INH adverse effects
    • (gastrointestinal symptoms, jaundice, nervous system)
  – Monitor a IPT register
BCG

- All children should be vaccinated using BCG vaccines as soon as possible after birth.
- Even though BCG has very little protection against all forms of TB it protects against severe disseminated forms of TB in children especially in the Neonatal age group
- Do not give BCG in those suspected to have TB infection at birth
- Defer BCG vaccination till two weeks after IPT/TB treatment
- BCG is not given to children with symptoms of HIV/congenital immunodeficiency syndrome
The efficacy of Bacillus Calmette-Guerin vaccination of newborns and infants in the prevention of tuberculosis: meta-analyses of the published literature

• This risk is highest in very young (3 years of age) and immune-compromised children.
  – Fifty per cent of infants
  – 20–30% of 1–2 year olds progress to disease usually within 12 months after primary infection.

• BCG vaccination of newborns and infants significantly reduces the risk of tuberculosis by over 50% on average. Up to 83% in Laboratory confirmed TB
Role of the community in TB control

• Identify and refer suspects around them to seek TB services
• Facilitate DOTS to children on treatment
• Assist in defaulter tracing
• Report any suspicious deaths which may be due to TB to enable contact tracing
• Creation of awareness within the community on TB-signs, symptoms and treatment
• Assist in contact tracing
Common scenarios for community health worker in management of child TB

- Child with symptoms and the diagnosis of TB is suspected

- Child who is a household or close contact of an infectious case of TB i.e. usually a case with sputum-smear positive disease

- Child on treatment for TB

- Persons who die of TB-Possible child contacts
Guidance for the management of children at community level who present with symptoms suggestive of TB

Symptoms suggestive of TB? Cough, fever, poor weight, less active, enlarged lymph nodes

Refer

Sputum available

Smear positive

Refer to the health facility for treatment

Smear negative

Sputum not available

Refer for further evaluation
DEFaulTER TRACING

• Definitions:
  – **Defaulter**- Any TB patient who misses scheduled appointment twice during the intensive phase or misses second month’s scheduled appointment during continuation is considered a defaulter.
  – **Defaulter tracing**- is the process of identifying, locating and retrieving patients who have stopped collecting/taking TB medication against medical advice
  – The health worker identifies defaulters from the treatment registers at health facilities
REASONS THAT MAY MAKE TB PATIENTS DEFAULT

• Long distance to treatment centers
• Long duration of treatment
• Large number of tablets required for treatment
• Adverse effects of TB drugs
• Lack of adequate health education
• Lack of improvement due to wrong diagnosis especially if based on X-ray alone or dual infection not diagnosed
• Lack of support from community, family and friends
• Negative attitude of clinic staff towards patients.
PEOPLE RESPONSIBLE FOR DEFAULTER TRACING

• Health workers (HWs)

• Community Health Extension Worker (CHEW)

• Community Health Workers (CHWs)

• Family members

• Village/provincial administration among others
INFECTION PREVENTION AND CONTROL
What is infection control?

Prevention of TB transmission in all directions
Risk of TB transmission

Factors could be:

• Institutional
• Patient
• Recipient
• Physical environment
• Bacterial
Institutional factors

• Overcrowding
• Exposure in small, enclosed spaces
• Lack of adequate ventilation
• Re-circulation of contaminated air
Patient factors

• Infectiousness: Positive sputum smear, cavitation, force and frequency of cough*
• Understanding of TB: cough etiquette*
• Treatment: (correct course and adherence)*
• Cough-inducing procedures *
• Likelihood of TB (prior treatment, age, homelessness, contact of known case, etc.)

*Influence the number of infectious bacilli in room air
Recipient factors

• Distance from infectious source *
• Duration, and frequency of contact*
• Adherence to infection control practices*
• Susceptibility either intrinsic or acquired (i.e. immune status, general health, other diseases, nutrition, age)

*Influence the number of infectious bacilli in the inhaled air
Recipient factors
Physical /Environment factors

• Proximity to Infectious individuals—important in children because the very young are in close contact with their caregivers.

• Adequate ventilation

• Humidity level
TB infection control required in

- In patient wards
- Outpatient clinics
- Laboratories
- Maternal and child health clinics
- VCT centers
- ART clinics
- TB clinics
- Hospices
- Community/Household
Areas visited by TB patients and suspects

Gen. wards

Lab. ward

Unsuspected TB Patient

Reception

OPD

VCT

X-ray

Lab

Ant. clinic

Physio

OT Social

TB Dept.

HOME / referral clinics

TB wards

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Hierarchy of Infection Controls

• Administrative controls
  – Triage, Separate infectious patients
  – Cough etiquette and respiratory hygiene

• EnvironVentilation systems
  – Natural ventilation
  – Mechanical ventilation

• Household
Personal protective equipment

Particulate respirators e.g. N95, FFP2 for HCW
Surgical masks for patients
Definitions

Close Contact: Is defined as someone in frequent contact with a source case with PTB. In same home, dorm, class room

Source Case: Any infectious person with Pulmonary TB

Contact Screening: Refers to the screening or evaluation for TB infection or disease of all close contacts of infectious PTB case