KPA CONFERENCE
23rd – 27th April 2018, Mombasa

Drug Resistant TB in children
Trend of TB cases in Kenya, 2000-2017

No. of cases

Year


73,017  82,114  95,310  105,818  108,400  115,234  116,723  110,251  110,015  106,082  103,981  99,159  89,332  89,333  81,447  81,518  75,916  85,188
There are more TB in Kenya than previously estimated....

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB prevalence &gt; 15 years in Kenya per 100,000</td>
<td>558</td>
</tr>
<tr>
<td>Extrapolated prevalence for all forms of TB and all ages per 100,000 in 2016</td>
<td>426</td>
</tr>
<tr>
<td>Prevalence to notification ratio</td>
<td>2.5:1</td>
</tr>
<tr>
<td>Estimated no. of people who fell ill with TB disease in 2016</td>
<td>169,000</td>
</tr>
<tr>
<td>Estimated paediatric cases in 2016</td>
<td>22,000</td>
</tr>
<tr>
<td>Proportion diagnosed and put on treatment</td>
<td>46%</td>
</tr>
</tbody>
</table>
Trends of Childhood TB cases in Kenya, 2008-2017

The chart shows the number of cases and the proportion of pediatric cases from 2008 to 2017. The number of cases generally decreases over the years, with the proportion of pediatric cases also decreasing. The highest number of cases was in 2008, and the lowest was in 2017.

The proportion of pediatric cases was highest in 2008 at 11.8% and lowest in 2017 at 9.1%.

The number of cases dropped significantly from 110,015 in 2008 to 85,188 in 2017.
Childhood DR TB cases in Kenya, 2012-2017

No. of DR TB Cases

Year

2012
2013
2014
2015
2016
2017

204
305
305
445
444
577

4%
2%
4%
2%
4%
5%

Proportion of paediatric cases

0% 1%
2%
3%
4%
5%
6%
7%
8%
9%
10%
Treatment outcomes of RR/MDR-TB in Kenya, 2006-15

Outcomes:
- TS: 100%, 100%, 75%, 74%, 84%, 86%, 83%, 83%, 75%, 67%
- Death: 0, 0, 17%, 17%, 13%, 10%, 8%, 11%, 15%, 14%
- LTFU: 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
Drug resistant TB in children: Epidemiology

- Very limited data available
- DR TB is common in children in settings where adult DR TB is common
- DR TB is increasing in children in settings where overall DR TB is increasing
Drug resistant TB in children: Transmission

- Transmitted from an adult source
- Early diagnosis and effective treatment most effective tool to reduce transmission
- Children with DR TB are not contributors to spread of DR TB
- DR TB in children is associated with increased morbidity and mortality compared to drug-sensitive disease
- Clinical presentation is generally same as drug susceptible TB
Diagnosis of DR TB in Children

Drug-resistant TB should be suspected when:

• Contact with known DR-TB
• Contact with suspected DR-TB, i.e. source case had treatment failure or was previously treated
• A child with TB is not responding to first-line therapy despite adherence
• A child previously treated for TB presents with recurrence of disease
Diagnosis of DR TB in Children

• Every effort should be made to confirm the diagnosis
• Children without bacteriological confirmation but are highly suspected to have DR TB should be initiated treatment
• Children who are contacts of a confirmed index case of DR TB, treat as per resistance pattern
Approach to diagnosis of DRTB in Children

• **Careful history**
  - History of contact with MDR TB case is critical information
  - Consider in child failing first-line TB treatment despite adherence

• **Clinical examination**

• **Investigations for suspected PTB or EPTB**
  - Attempt to get samples for culture and DST
Treatment of DR TB Children

- Do not add a drug to a failing regimen
- While treating a child with presumptive DR TB, use the regimen of the index case and adjust once the child’s DST results are available
- Use at least four drugs to be effective
- Pyrazinamide is included as part of the MDR TB regimen
- Do patient baseline tests prior to treatment as per the PMDT guidelines.
  - Baseline test results should not delay treatment initiation
Treatment of DR TB in Children

• Use daily directly observed therapy (DOT) by a HCW
• Counsel the caregiver:
  • About adverse events and the importance of compliance and completion of treatment
• Dosing for treatment should be based on the child’s weight
• Monthly follow-up using clinical and laboratory evaluation
  • Review must be done by a multi disciplinary clinical team
  • Adverse drug reaction monitoring is crucial
## Clinical and Lab follow up

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<th>Month</th>
<th>Baseline</th>
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<th>4</th>
<th>5</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>15</th>
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<td>Clinical review</td>
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<td>Every 2 weeks</td>
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<td>X</td>
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<td>Weight</td>
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## Clinical and Lab follow up

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<tr>
<th>Test</th>
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<tbody>
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<td>LFTs (AST, ALT, Bilirubin)</td>
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<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>Creatinine, Potassium</td>
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<td>X</td>
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<td>X</td>
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<td>Full hemogram</td>
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<td>Viral Load</td>
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<td>Pregnancy test</td>
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</tbody>
</table>
Management of child contact of DR TB case

• Identification and **symptomatic screening of all contacts** of DR TB cases is important

• Investigation of symptomatic contacts using:
  • Drug susceptibility tests (Line Probe Assay or Xpert MTB/RIF)
  • Culture
  • Chest-xray

• Asymptomatic contacts are followed up quarterly for at least 2 years
Common side effects of second-line medicines, their likely causing agents, and suggested management strategies

<table>
<thead>
<tr>
<th>Classification group</th>
<th>Name of Drug</th>
<th>Side-effects</th>
<th>Uncommon</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Common</td>
<td></td>
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<tr>
<td>Group 1:</td>
<td>Isoniazid (H)</td>
<td>Hepatitis, Cutaneous hypersensitivity, Peripheral neuropathy</td>
<td>Giddiness, Convulsion, Optic neuritis, Mental symptoms, Haemolytic anaemia, Aplastic anaemia, Lupoid reactions, Arthralgia, Gynaecomastia</td>
</tr>
<tr>
<td></td>
<td>Rifampicin (R)</td>
<td>Hepatitis, Cutaneous hypersensitivity, Gastrointestinal reactions, Thrombocytopenic, purpura, Febrile reactions, &quot;Flu syndrome&quot;</td>
<td>Shortness of breath, Shock, Haemolytic anaemia, Acute renal failure</td>
</tr>
<tr>
<td></td>
<td>Ethambutol (E)</td>
<td>Retrobulbar neuritis, Arthralgia</td>
<td>Cutaneous reaction, Peripheral neuropathy</td>
</tr>
<tr>
<td></td>
<td>Pyrazinamide (Z)</td>
<td>Hepatitis, Nausea, Vomiting, Arthralgia,</td>
<td>Sideroblastic anaemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Streptomycin (S)</td>
<td>Cutaneous hypersensitivity, Giddiness, Numbness, Tinnitus, Vertigo, Ataxia, Deafness</td>
<td>Renal damage, Aplastic anaemia</td>
</tr>
<tr>
<td>Group 2:</td>
<td>Kanamycin (Km)</td>
<td>Ototoxicity: hearing damage, vestibular, disturbance, Nephrotoxicity; deranged renal function test</td>
<td>Clinical renal failure</td>
</tr>
<tr>
<td></td>
<td>Amikacin (Am)</td>
<td>Ototoxicity: hearing damage, vestibular, disturbance, Nephrotoxicity; deranged renal function test</td>
<td>Clinical renal failure</td>
</tr>
<tr>
<td></td>
<td>Capreomycin (Cm)</td>
<td>Ototoxicity: hearing damage, vestibular, disturbance, Nephrotoxicity; deranged renal function test</td>
<td>Clinical renal failure</td>
</tr>
</tbody>
</table>
Promising future......

- Paediatric friendly 2\textsuperscript{nd} line formulations
- Nationwide scale up facility-based active case finding (ACF)
- Adoption of technologies and formulations
Asanteni sana