PMTCT, early infant diagnosis, paediatric and adolescent HIV

5TH APRIL 2019
PRESENTED BY: KARL TECHNAU

Bilateral Workshop on Transmissible Diseases: HIV/AIDS, Tuberculosis and Malaria
Transmission has moved from 20-40% down to 2%

Early peak of mortality remains

ART treatment after a diagnosis at birth potentially enables identification of majority of infected newborns

- 20% by 3 months
- 50% by 1 year
Testing – Identifying who is exposed

Maternal testing at delivery facility important

June 2014- Dec 2016

- 16 (16%) of 99 infected neonates identified at birth were born to 221 women newly diagnosed as part of the postnatal maternal testing programme of 7085 women.

Challenges exist over weekends and public holidays.

Testing dips over holiday periods.

221 women newly diagnosed at delivery.

**Women with live births, n=30591**

<table>
<thead>
<tr>
<th>Admission Status:</th>
<th>HIV-negative</th>
<th>HIV-unknown</th>
<th>HIV-positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>n:</td>
<td>23126</td>
<td>601</td>
<td>6864</td>
</tr>
<tr>
<td>HIV Test Offered:</td>
<td>16208 (70%)</td>
<td>601 (100%)</td>
<td></td>
</tr>
<tr>
<td>HIV Test Refused/Missed:</td>
<td>1216 (7.5%)</td>
<td>7 (1.2%)</td>
<td></td>
</tr>
<tr>
<td>Tested:</td>
<td>14992</td>
<td>594</td>
<td></td>
</tr>
<tr>
<td>New HIV Positive:</td>
<td><strong>124 (0.8%)</strong></td>
<td><strong>97 (16%)</strong></td>
<td></td>
</tr>
</tbody>
</table>

HIV-positive women, n=7085
Future Work

- INCREASED ID OF EXPOSED INFANTS
- REDUCING MATERNAL HIV INCIDENCE
- HEU CHILDREN – SPECIFIC NEEDS
EID and POINT of CARE Testing
Results – Phlebotomy to result

- Result release POC PCR: 2.6 hours (95% CI: 2.3-3.1)
- Result release LAB PCR: 43 hours (95% CI: 31-54)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Median minutes</th>
<th>Inter-quartile range</th>
</tr>
</thead>
<tbody>
<tr>
<td>From phlebotomy to side room</td>
<td>40 (24%)</td>
<td>25-58</td>
</tr>
<tr>
<td>Processing in side room</td>
<td>11 (6%)</td>
<td>8-14</td>
</tr>
<tr>
<td>In the POC machine</td>
<td>90 (53%)</td>
<td>90-90</td>
</tr>
<tr>
<td>Authorising and despatching result out of side room</td>
<td>13 (8%)</td>
<td>7-26</td>
</tr>
<tr>
<td>Mother receives the result</td>
<td>16 (9%)</td>
<td>10-27</td>
</tr>
</tbody>
</table>

- Minutes authorising and despatching result out of side room, 13 minutes (8%)
- Mother receives the result, 16 minutes (9%)
- From phlebotomy to side room, 40 minutes (24%)
- Processing in side room, 11 minutes (6%)
- In the POC machine, 90 minutes (53%)
### Results – Receipt of result (Any result)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>POC and LAB PCR</th>
<th>LAB PCR only</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=3970</td>
<td>N=2238</td>
<td>N=1732</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother received neonates results, n (%)</td>
<td>3076 (77.5)</td>
<td>2155 (96.3)</td>
<td>921 (53.2)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Median age in days (IQR)</td>
<td>1 (1-8)</td>
<td>1 (0-1)</td>
<td>10 (9-13)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

- Significantly fewer mothers received the result in absence of POC PCR
- Mothers received results significantly later in the absence of the POC PCR
- Time to ART initiation significantly shorter with POC PCR
Future Work

- Identifying how to improve access to tests and results
- Elucidate role of POC in care
• 20-25% of birth non-negative cases (positive and indeterminate) require more than one further confirmatory test.

0.3% of total
17% of non-neg
### Outcome of INDETERMINATEs

**Table 1. Steps in establishing final HIV infection status of 102 infants with non-negative birth PCR results**

<table>
<thead>
<tr>
<th>First PCR result</th>
<th>Second PCR result</th>
<th>Earliest VL result</th>
<th>Final HIV infection status,† N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Result</td>
<td>Age (days)‡</td>
<td>n, VL (log RNA copies/ml)‡, Age (days)‡</td>
</tr>
<tr>
<td>Birth HIV PCR test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>78</td>
<td>Positive</td>
<td>68, 2 (1–9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indeterminate</td>
<td>4, 4, 8, 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not tested</td>
<td>6</td>
</tr>
<tr>
<td>Total birth HIV PCR positive results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indeterminate</td>
<td>24</td>
<td>Positive</td>
<td>5, 6 (6–12)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indeterminate</td>
<td>7, 8 (6–24)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not tested</td>
<td>1</td>
</tr>
<tr>
<td>Total birth HIV PCR indeterminate results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total, n = 102</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Future Work

• CRITICAL TO MONITOR DIAGNOSTIC OUTCOMES IN CONTEXT OF DTG INTRODUCTION
• WHILE TRANSMISSION DROPS DIAGNOSIS BECOMES MORE DIFFICULT
ART start

- Three drug regimen according to standard guidelines
  - AZT, 3TC, NVP
- A switch to Lopinavir/rit after 42 weeks PMA
- Simple techniques may assist early adherence, e.g. Careful labelling of syringes
ART start

- 88 infant diagnosed at birth
- 12 month mortality 14%
- 12 month retention 78%
- 12 month VL <400cps/ml 71%
- VL pre-ART >100,000 predictive of 3-4 times higher mortality


GUILT
FEAR
DEPRESSION

Stages of the Grief Cycle

“NORMAL” FUNCTIONING

Shock and Denial
- Avoidance
- Confusion
- Fear
- Numbness
- Blame

Anger
- Frustration
- Anxiety
- Irritation
- Embarrassment
- Shame

Depression and Detachment
- Overwhelmed
- Blahs
- Lack of energy
- Helplessness

Empowerment
- Security
- Self-esteem
- Meaning

Acceptance
- Exploring options
- A new plan in place

Dialogue and Bargaining
- Reaching out to others
- Desire to tell one’s story
- Struggle to find meaning for what has happened

RETURN TO MEANINGFUL LIFE

Adapted from Kübler-Ross, 1969
Future Work

- IMPROVED FORMULATIONS FOR INFANTS – KALETRA SYRUP STILL A BARRIER TO ADHERENCE
- COMPREHENSIVE PSYCHO SOCIAL SUPPORT
- REDUCTION IN INFANT MORTALITY STILL A MAJOR CHALLENGE
Patterns of virologic response to early treatment over the first year of life

Future Work

- FURTHER CURE RESEARCH
- ANTIBODIES FOR PREVENTION AND TREATMENT
Paediatrics and Adolescents

- Care to include and focus on long term wellbeing
  - Early Childhood development
  - Educational Development
  - Disclosure
  - Mental Health
  - Substance Abuse
  - Transition to adult care

**Conclusions**

- Mental health and substance use problems are common among adolescents in HIV care in South Africa and Zimbabwe and strongly associated with virologic failure among adolescents in South Africa.

- Our findings suggest that mental health screening and proactive management may be a critical avenue for ensuring better mental health and HIV treatment outcomes among adolescents in Southern Africa.
Future Work

- DIFFERENTIATED CARE IN CHILDREN
- ACHIEVING NORMAL EDUCATIONAL AND MENTAL HEALTH OUTCOMES
- SUCCESSFUL TRANSITION THROUGH ADOLESCENCE
Conclusion

- Great achievements to reduce MTCT
- Diagnostic dilemmas remain and set to increase
  - New drugs, e.g. DTG likely to have a positive effect on MTCT but require monitoring
  - Sentinel sites critical to evaluate implementation
  - POC diagnostics hold promise but implementation needs further cost effectiveness work
- Treatment success in infants modest
  - ART access still a problem
  - Better strategies needed
- Transition to adulthood
  - Better outcomes need to be strived for – not only survival
  - Comprehensive psychosocial support critical as well as comprehensive support of families
ESRU Team

- Prof Coovadia, ESRU Research Unit Team
- Dr Renate Strehlau, Dr Kate Braithwaite, Dr Megan Burke,
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- NICD – Prof Gayle Sherman, Prof Caroline Tiemessen and team
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Thank you!
References


