Optimal timing for serological screening for HIV exposed uninfected infants; the later the better?

Avni Hindocha
ST3 Paediatrics

St Mary’s Hospital
Chelsea & Westminster Hospital
Background

• HIV exposed uninfected (HEU) infants routinely tested¹:
  – HIV RNA PCR: birth, 6 weeks, 12 weeks
  – HIV antibody: 18 months

• Sero-reversion in infant – loss of maternal HIV antibodies

¹British HIV Association guidelines for the management of HIV in pregnancy and postpartum 2014
Background

• 4\textsuperscript{th} generation antigen/antibody assay + repeat confirmatory testing

• Assay \textit{incredibly} sensitive – low levels maternal antibody

• Leads to retesting
Methods

• Two NHS trusts – SMH, C&W

• Database of babies born to mothers with HIV

• DOB January 2013 – August 2016

• Nurse specialist records, case records (paper, electronic)
Methods

• Data collection:
  – Gestation
  – Breastfeeding status
  – Age at first and subsequent tests
  – Assay results
Methods

• 4th generation antibody/antigen assay
  – PHE: Screen and confirmatory tests
  – Both similar: high sensitivity and specificity

• Gold standard for early diagnosis of HIV 1 or 2

• Architect HIV Ag/Ab Combo – immunoassay
  - Not distinguish between Ag or Ab

• Vidas HIV Duo Ultra – enzyme linked fluoroassay
  - Different values for Ag and Ab
Results

• 142 infants
  – 0 infants had positive HIV PCR tests

• 21 (14.8%) patients excluded
  – 4 breastfed (different pathway)
  – 17 lost to follow up

• 121 infants
  – 83% born at term (31-42w gestation)
  – Median age testing: 19.1 months (8.5-34.6)
Results

• ‘18 month’ antibody test positive \(\frac{10}{121} = 8.3\%\)
  – Median age \(18.3\) [IQR 18.1, 18.8] vs \(19.2\) [18.1, 21.5] months
  – Median gestation \(38.5\) weeks

• 7/10 reactive on screening and confirmatory assays
Results

- **Positive**
- **Negative**

**Preterm**

- <37/40
Results

• Further results available on 8/10 infants
• Second test:
  – Median age 21.3 months
• 5/8 non-reactive

• 3 remaining:
  – Non-reactive on confirmatory assay
  – Reactive, HIV RNA PCR negative
  – Reactive, repeat 3rd test at 29.4 months – non-reactive
## The ‘positive ten’

<table>
<thead>
<tr>
<th>Patient</th>
<th>Gestation</th>
<th>Age 1\textsuperscript{st} test (m)</th>
<th>Age 2\textsuperscript{nd} test (m)</th>
<th>Age 3\textsuperscript{rd} test (m)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37</td>
<td>19.1</td>
<td>23.8</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>22.0</td>
<td>24.7</td>
<td>29.4</td>
<td>Negative</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>13.1</td>
<td></td>
<td></td>
<td>FU elsewhere</td>
</tr>
<tr>
<td>4</td>
<td>38</td>
<td>18.5</td>
<td>22.4</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>5</td>
<td>38</td>
<td>18.5</td>
<td>21.2</td>
<td></td>
<td>VL negative</td>
</tr>
<tr>
<td>6</td>
<td>40</td>
<td>18.2</td>
<td>20.8</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>7</td>
<td>39</td>
<td>18.1</td>
<td></td>
<td></td>
<td>FU elsewhere</td>
</tr>
<tr>
<td>8</td>
<td>37</td>
<td>17.9</td>
<td>20.5</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>9</td>
<td>38</td>
<td>18.9</td>
<td>20.9</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>10</td>
<td>41</td>
<td>18.2</td>
<td>21.4</td>
<td></td>
<td>Confirm negative</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>38.7</td>
<td>18.3</td>
<td>22.0</td>
<td>29.4</td>
<td></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>38.5</td>
<td>18.3</td>
<td><strong>21.3</strong></td>
<td>29.4</td>
<td></td>
</tr>
</tbody>
</table>
Conclusion

• **8.3%** HEU infants required repeat serology

• Delaying to 22 months – reduce to **<2%**

• Reduced costs:
  – Emotional – parents and toddlers
  – Outpatient resources
  – Test costs: HIV serology £7, HIV RNA PCR £20
Changes to our practice

• *Postpone* HEU infant screening to 22 months

• If positive at 22 months → test **HIV RNA PCR**
Thank you

Co-authors: Paul Randell, Paula Seery, Tamanna Rahimi, Natalie Kirkhope, Sophie Raghunananan, Caroline Foster, Gareth Tudor-Williams, Hermione Lyall