**BACKGROUND**

- According to the Centers for Disease Control and Prevention (CDC) approximately 12.8% of people living with HIV are unaware of their infection.
- Screening known HIV positive persons for Syphilis is important due to the increase in HIV/Syphilis coinfections in the United States and could reduce morbidity and mortality of HIV as Syphilis infections can increase HIV transmission.
- Dried blood spot (DBS) samples could be used to screen more persons for HIV and Syphilis at home or in community settings by utilizing self-collection.
- We evaluated the feasibility of using DBS in HIV and Syphilis rapid point of care detection.

**METHODS**

- **DBS sample construction**
  - DBS were created by spiking 50uL of negative whole blood with 50uL of reference specimen; 80uL of the mixture was spotted onto a DBS HemaSpot™ Blood Collection Device (SpotOn Sciences).
  - Reference material was either the SeroDetect HIV Ag/Ab Combo Panel (ZeptoMetrix Corp.) samples or positive and negative serum samples archived in the laboratory from previous studies.
- **DBS Processing**
  - Half of each HemaSpot DBS was eluted into 500uL of 0.5% PBST, vortexed and eluted overnight at 4ºC.
- **DBS Testing**
  - Eluates were tested for p24 Ag and/or HIV Ab by Alere Determine™ HIV-1/2 Antigen Antibody Combo (Alere) or Multispot HIV-1/HIV-2 Rapid Test (BioRad); and Treponemal antibodies for Syphilis by Syphilis Health Check (Trinity Biotech).
  - Eluates were tested according to manufacturers’ instructions for serum specimens.
- **Resulting**
  - Accuracy: DBS result compared to reference material result.
  - Clinical sensitivity and clinical specificity: expressed as positive percent agreement (PPA) and negative percent agreement (NPA), respectively.
  - Reproducibility: each eluate tested four times by two technicians over a minimum of three days; expressed as percent.

**RESULTS**

<table>
<thead>
<tr>
<th>Method</th>
<th>Clinical Sensitivity and Specificity (PPA and NPA)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Results from Comparison Method)</td>
<td></td>
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<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
</tbody>
</table>

**Alere:**

- **Accuracy – DBS compared to ZeptoMetrix panel**
  - 100% (40/40)
  - PPA and NPA – 100% (20/20); 100% (20/20)
  - Reproducibility – 100% (160/160)

**Multispot:**

- **Accuracy – DBS compared to serum samples**
  - 100% (26/26)
  - PPA and NPA – 100% (11/11) and 100% (15/15)
  - Reproducibility – 100% (104/104)

**Health Check:**

- **Accuracy – DBS compared to serum samples**
  - 100% (40/40)
  - PPA and NPA – 100% (20/20); 100% (20/20)
  - Reproducibility – 99.3% (159/160)

**Conclusions**

- DBS could be amenable to home collection due to their ease of collection, transport and stability.
- Monitoring positivity rates in the population being tested using DBS would be beneficial.
- DBS appear to be an acceptable method to screen participants, for HIV and Syphilis, who collect their samples at home.

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