Abstract #10

Use of Dried Blood Spots and the Gen-Probe Aptima HIV-1 RNA Qualitative Assay for the Diagnosis of Infants and Detection of Acute Infection from Pooled Samples

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OBJECTIVE

To develop a cost-effective, sensitive method for diagnosing acute HIV infection and infant infection using dried blood spots (DBS) and the Gen-Probe Aptima HIV-1 RNA Qualitative Assay.

METHODS

A PBS/detergent buffer was developed to elute the blood, including HIV-1 virions, from DBS. The limit of detection of the assay was tested using DBS made with spiked whole blood, DBS from HIV-1-infected and uninfected adults (n=33 and n=12, respectively), and DBS from infants (n=138). Optimal pooling strategies were determined and then used to assess the ability of the pooled DBS assay to detect HIV infection in adults and infants.

RESULTS

Using spiked whole blood, the limit of detection was ~400 cp/ml. However, when DBS from HIV-1-infected patients were tested, the assay proved to be more sensitive. All specimens from infected adults with detectable viral loads in the Roche HIV RNA assay (n=25) (viral loads >50 cp/ml) and 28/29 specimens from infected infants were positive (viral loads >1000 cp/ml). In addition, 5 of 7 infected adults with viral loads <50 cp/ml were detected in the assay. The one false negative infant specimen was from a DBS that had been stored for 4 years at room temperature. All 120 specimens from uninfected adults and infants were negative (100% specificity). Pooling of up to 50 DBS with a single positive punch was reactive in the assay if the positive punch had a viral load of at least 10,000 cp/ml. Greater sensitivity was achieved with a smaller pool size.

CONCLUSIONS

The Gen-Probe Aptima HIV-1 RNA Qualitative Assay was successfully adapted to work with DBS. This assay could be used as a sensitive, specific, cost-effective way to determine acute infection in populations such as infants, vaccine recipients, blood donors, pregnant women, or STD clients.