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Paper Poster Session IV

Updates on viral hepatitis

Evaluation of the dried blood spot (DBS) method as a tool for the screening of HIV Ag/Ab, HBsAg and anti-HCV using the Abbott Architect

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Objectives

Under-diagnosed and reported infection from blood-borne viruses (BBVs) poses a major public health risk, particularly Hepatitis C in communities of high prevalence (mental health and prison facilities). To increase the uptake a simple convenient screening tool such as dried blood spot testing (DBST) is therefore required. DBST uses a novel collection card allowing serological testing of capillary blood obtained from a finger prick on the Abbott Architect.

Our objectives were to evaluate and validate a DBST method enabling diagnostic screening for HCV, HBV and HIV from the same sample, using a single 1X6mm spot and to compare the results of venous whole blood to capillary DBS samples.

The study was also designed to assess and develop new innovative ways of making Pathology services more accessible through alternative phlebotomy methods and to set up robust methodologies closely linked to clinical situations where the use of DBST could make a difference to patient care.

To our knowledge, this study is the first to use a single 1x6mm DBS (low blood volume) for the simultaneous detection of HIV Ag/Ab, HBsAg and anti-HCV using the Abbott Architect with 100% sensitivity.

Methods

Dried blood spots prepared from venous whole blood and capillary finger prick samples were evaluated. For each sample, 4x3mm and 1x6mm discs were cut and eluted. They were then tested on the Abbott Architect and cut-off absorbance values (COAVs), sensitivities and specificities compared to paired plasma results.

Results

A total of 753 paired venous and DBS samples were analysed to determine COAV, 368 for validation and a further 52 samples for capillary standardisation.
DBS COAVs of 0.4, 0.6 and 0.04 RLUs (relative light units) were determined for HIV Ag/Ab, HBsAg and anti-HCV respectively. The same COAV can be used for both 4x3mm and 1x6mm DBS samples. Sensitivity of 100% was observed for validation of HIV Ag/Ab, HBsAg and anti-HCV with specificities of 93.33%, 100% & 89.23% using 4x3mm and 95.11%, 100% & 89.23% using 1x6mm respectively. Capillary finger-prick DBS sensitivity was also 100% for all 3 assays with specificities of 95.12%, 100% & 100% using 4x3mm and 95.12%, 100% & 98.07% using 1x6mm for HIV Ag/Ab, HBsAg and anti-HCV respectively.

Conclusions

The use of DBST is an innovative way of improving accessibility to Pathology through alternative phlebotomy methods, enabling wider screening for BBVs to combat the problem of undiagnosed infection.
Collection is simple, minimising the risks of sharps injuries, requiring minimal training and is a reliable screening method in situations arising when blood collection is difficult.
The study showed high sensitivity and specificity for the detection of HIV Ag/Ab, HBsAg and anti-HCV in the DBS samples and would therefore be an ideal choice to be used as screening tool for BBV infections in the community.