Abstract #53

Rapid Detection of HIV-1 p24 Antigen by Magnetic Immuno-Chromatographic Testing (MICT)

Abstract Category:	New HIV Diagnostic Technologies Including Those That Are Not FDA Approved
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OBJECTIVE

To develop a sensitive and rapid HIV assay for the detection of HIV-1 p24 antigen in serum/plasma. This assay could be used in low volume venues to improve early detection of HIV infection in adults and newborns.

METHODS

MICT uses standard lateral flow assay technology assay with super-paramagnetic particles as the detection reagent. Monoclonal (mouse) and polyclonal (rabbit) antibodies to HIV-1 p24 protein were produced, purified and characterized. Polyclonal capture of p24 was detected using a mouse monoclonal (1E5 directed to the C terminus of p24) covalently conjugated to 300 nm super paramagnetic particles. The formation of the immune complex at the test line is measured by the Magnetic Assay Reader (MAR) from MagnaBiosciences. The reader uses magnetic sensors to create a reaction curve, which is mathematically validated and integrated, versus an ideal magnetic spectrum. The amount of p24 detected is directly proportional to the area under the curve. Assay performance was determined using p24 and viral-spiked buffers and plasma, and p24 reactive specimens from HIV seroconversion panels.

RESULTS

MICT assay showed reproducible detection of ~25pg/mL of HIV p24 antigen in running buffer. Detection of p24 spiked plasma was initially reduced by 75% due to matrix effects. Buffer modifications and a reduction of plasma to 50% significantly improved detection (assay sensitivity of 62 pg/ml). P24 was detectable in virus-spiked buffers and in seroconversion panels at high viral concentrations.

CONCLUSIONS

MICT detects HIV p24 antigen at concentrations slightly higher than conventional EIAs but in much less time (30 min vs. 2.5 hr). Further optimization of the assay is underway to reduce matrix effects and to improve the lower limit of detection.