

Diagnosis of HIV-1 Infection in Phase I and II HIV Vaccine Trials

<i>Abstract Category:</i>	Emerging Dilemmas: HIV-2 Confirmation and Diagnosis in HIV Vaccine Recipients
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OBJECTIVE

To evaluate the UNAIDS and WHO HIV Testing Strategy III for diagnosis of HIV infection in low-risk, low seroprevalence phase I/II HIV vaccine trials conducted in the United States.

METHODS

A routine diagnostic HIV algorithm was used for participants who completed 15 phase-I and one phase-II vaccine trials in the United States after March 2006. Three enzyme-immunoassay (EIA) test kits were used: Abbott HIV-1/HIV-2 rDNA EIA, bioMerieux Vironostika HIV-1 Microelisa System, and Bio-Rad Genetic Systems HIV1/2 Plus O EIA. A specimen that was reactive in all three EIA tests (a UNAIDS/WHO Testing Strategy III criterion for asymptomatic HIV infection with a prevalence of <10%) or was repeatedly reactive with one or two of the three EIA tests was confirmed with the Bio-Rad Genetic Systems HIV-1 Western Blot (WB). HIV-1 RNA testing was used to confirm all indeterminate or positive WB results.

RESULTS

Among 733 participants tested once at the end-of-study visit, all three EIA tests were negative in 421 (57.4%). Of the 312 participants with a reactive EIA test, 108 (34.6%) were WB negative, 157(50.3%) were indeterminate and 47 (15.1%) were positive using Centers for Disease Control (CDC) criteria. All 204 reactive WB were HIV-1 RNA undetectable. There were 53 participants who were EIA reactive in all three tests, 14 were WB-positive and 39 were WB-indeterminate. The UNAIDS and WHO Testing Strategy III algorithm would have assigned these 53/733 (7.2%) uninfected vaccine participants as HIV-1 infected. Additionally, 14/53 (26%) had a positive WB by CDC criteria also assigning them as HIV-1 infected. However, all 53 participants were HIV-1 uninfected using HIV RNA criteria.

CONCLUSIONS

Current HIV-1 diagnostic algorithms based solely on serologic criteria for infection are inadequate for diagnosing HIV-1 infection in HIV vaccine trial participants because of vaccine-induced false-positive confirmatory WB test results. As such, future diagnostic algorithms should incorporate HIV nucleic acid testing. Moreover, for vaccine trial participants, HIV testing outside of the study protocol should be approached with caution until health care providers are educated about HIV vaccines and the need for diagnostic HIV algorithms that incorporate HIV nucleic acid testing.