

New Test Algorithm to Detect Acute and Chronic HIV Infection Using a 4th Generation Combo Test

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Abstract : Acquired immunodeficiency syndrome (AIDS) is caused by two types of human immunodeficiency viruses, collectively designated HIV. HIV infection is spreading globally particularly in developing countries. Before an individual is diagnosed with HIV, the disease goes through different phases. First there is an acute early phase that is followed by an established or chronic phase. Subsequently, there is a latency period after which the individual becomes immunodeficient. It is in the acute phase that an individual is highly infectious due to a high viral load. Presently, HIV diagnosis involves use of tests that do not detect the acute phase infection during which both the viral RNA and p24 antigen are expressed. Instead, these less sensitive tests detect antibodies to viral antigens which are typically sero-converted later in the disease process following acute infection. These antibodies are detected in both asymptomatic HIV-infected individuals as well as AIDS patients. Studies indicate that early diagnosis and treatment of HIV infection can reduce medical costs, improve survival, and reduce spreading of infection to new uninfected partners. Newer 4th generation combination antigen/antibody tests are highly sensitive and specific for detection of acute and established HIV infection (HIV1 and HIV2) enabling immediate linkage to care. The CDC (Center of Disease Control, USA) recently recommended an algorithm involving three different tests to screen and diagnose acute and established infections of HIV-1 and HIV-2 in a general population. Initially a 4th generation combo test detects a viral antigen p24 and specific antibodies against HIV -1 and HIV-2 envelope proteins. If the test is positive it is followed by a second test known as a differentiation assay which detects antibodies against specific HIV-1 and HIV-2 envelope proteins confirming established infection of HIV-1 or HIV-2. However if it is negative then another test is performed that measures viral load confirming an acute HIV-1 infection. Screening results of a Phoenix area population detected 0.3% new HIV infections among which 32.4% were acute cases. Studies in the U.S. indicate that this algorithm effectively reduces HIV infection through immediate treatment and education following diagnosis.

Keywords : new algorithm, HIV, diagnosis, infection

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