

Detection of Primary HIV Infection in North Carolina's Counseling and Testing Sites

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An estimated 40,000 new HIV infections occur annually in the US. Approximately 1,500 newly diagnosed HIV cases are reported in North Carolina annually. Very few of these cases are acute HIV infection because standard HIV antibody testing is unable to make that diagnosis. Acute HIV infection—characterized by high virus burden and evolving host immunity—is sometimes accompanied by a self-limited, mononucleosis-like “acute retroviral syndrome” that is rarely diagnosed. It has been hypothesized that early antiretroviral treatment during this period may augment host immunity and improve long-term prognosis for treated patients. Moreover, HIV transmission can occur readily during acute HIV infection and may, in fact, account for a disproportionate amount of HIV transmission relative to transmission by individuals in later stages of infection. These observations agree well with mathematical models that predict elevated transmission probabilities due to higher shedding in semen during acute infection, and with an increased probability of sexual transmission with increasing blood viral load. Acute HIV infection is therefore an attractive target for public health interventions. Because preliminary evidence suggests that early short-course antiretroviral treatment may alter long-term prognosis in acute HIV infection, current USPHS/DHHS guidelines for treatment of HIV infection recommend that urgent treatment be considered in the setting of acute infection.

A UNC CFAR/NC DHHS pilot study (Pilcher, McPherson, Leone, et al; July 10,2002 JAMA) examined the prevalence of acute HIV infection in the NC routine HIV counseling and testing population using HIV nucleic acid screening of seronegative serum specimens. By first screening for HIV RNA in pools made from seronegative

specimens, and then deconstructing HIV RNA positive pools to determine individual positive specimens, it was possible to identify individuals that had possible acute HIV infection. HIV antibody negative/RNA positive patients were contacted by state Disease Intervention Specialists and confirmatory testing was performed. In the one-month initial pilot program, 8194 consecutive at risk subjects presenting for routine tests at 110 counseling and testing sites across NC were screened, of whom 39 were HIV antibody positive [chronic HIV infection prevalence: 47.6 per 10,000 at risk persons (95% CI 33.8-65.0 per 10,000)]. Of 8155 at risk subjects with negative antibody tests, 5 were HIV RNA positive, of whom 4 had true positive acute infection [prevalence 4.9 per 10,000 (95% CI 1.3- 12.5 per 10,000); because of pooling, overall specificity was excellent at 0.9999 (95% CI 0.9993-1.0000)]. Interestingly, 3 of 4 acute infections were asymptomatic at initial testing but 2 subsequently developed a characteristic acute retroviral syndrome. We estimate that 40-60 acute HIV infections may be identified annually through an expanded acute HIV screening program. These individuals currently would not be identified through HIV antibody testing procedures. All patients are currently counseled that antibody testing may not identify early HIV infection and that they should be retested in three months if they had a recent potential exposure to HIV. Still, many patients equate a negative HIV antibody test with not being infected with HIV and are lost to follow-up and potential diagnosis of HIV infection.

These results suggest that antibody negative acute HIV infection may be unexpectedly prevalent and that routine screening for these infections is feasible. The results also provide a compelling public health reason to screen for acute HIV infection. The STAT (SCREENING AND TRACING FOR ACTIVE HIV TRANSMISSION) program was therefore developed specifically to carry the concept forward and operationalize protocols for efficient acute HIV screening (using low cost, ultra-sensitive RNA detection technology and robotic pooling), rapid partner notification and screening in the public

health setting. HIV/STD Disease Intervention Specialists will be trained to provide rapid follow-up and appropriate counseling to individuals testing HIV RNA positive. Staff in the Virology/Serology Unit of State Laboratory of Public Health and the DIS in the HIV/STD Prevention and Care Branch will play an important role in the evaluation of the STAT Project.

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