Abstract

**Title of the study:** Human Immunodeficiency Virus Antibody Avidity Testing to identify recent infection among the newly diagnosed HIV-1 infected individuals and the effect of Antiretroviral Therapy on the Avidity Antibodies – A pilot study

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**Introduction:**

Recent (<6months) and long term HIV infection can be differentiated by antibody avidity testing. The viral kinetics can impact the humoral immune response and may modify the pathogenesis of the infection.

**Objectives:**

To determine the frequency of recent HIV-1 infections among the volunteers who attended ICTC at a tertiary care center using a commercial Limiting Antigen (LAg) avidity EIA, to compare the findings with an in-house avidity assay and to study the impact of ART on maturation of HIV-1 specific antibodies.
**Methodology:**

Samples from 117 treatment naïve HIV-1 infected individuals who attended ICTC and archived paired plasma of HIV-1 infected individuals prior to ART, 6-12 months following successful treatment and individuals who had virological failure were tested using a commercial LAg-Avidity EIA. The normalized optical density (ODn) values obtained were compared with in-house avidity assay values and band intensity in Western Blot.

**Results:**

Of these, 117 HIV-1 infected individuals, 8 (6.83%) were found to be recently infected with HIV-1. The in-house avidity assay had a sensitivity of 100% (95% CI 63.09-100%) and specificity 99.08% (95% CI 94.99-99.98%) with good agreement (κ=0.94). The western blot analysis of samples from recently infected individuals showed weak or no band against pol proteins. The mean ODn values of samples from HIV-1 infected individuals (n=25) responding to treatment was significantly lower than the samples prior to treatment (ODn = 3.977±1.1 Vs ODn = 4.306± 0.97, p=0.0038) while there was an increase in the ODn values when individuals (n=7) had virological failure (p = 0.057).

**Conclusion:**

The frequency of recent HIV-1 infection was 6.83% in newly diagnosed HIV-1 cohort. Antiretroviral therapy had a significant effect on avidity of HIV-1 antibodies, possibly predicting virological failure. The modification of the indigenous assay allows the availability of testing for recent HIV-1 infection with low cost.

**Keywords:** Avidity assay, HIV, recent infection, ART, India