Broadly Neutralizing HIV-1 Antibody Reactivity in Diagnostic Tests: Implications for Screening

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Methods

Background

• Passive immunization with long-acting broadly neutralizing antibodies (bNAbs) is a novel strategy for HIV prevention
• Target gag,p24 (CD4-binding site, V3 loop and V3 loops) and gp41, two envelope antigens commonly present in diagnostic tests

bNAbs were acquired from the NIH AIDS Reagent Program:
- Target gag,p24 (CD4-binding site, V3 loop and V3 loops) and gp41
- Two envelope antigens commonly present in diagnostic tests

- The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Broadly Neutralizing HIV-1 Antibodies for Prevention

- Passive immunization with long-acting broadly neutralizing antibodies (bNAbs) is a novel strategy for HIV prevention
- Target gag,p24 (CD4-binding site, V3 loop and V3 loops) and gp41, two envelope antigens commonly present in diagnostic tests

Results

Table 1 shows the results of bNAbs at 1 mg/mL, the highest concentration tested, on the HIV tests evaluated

There was no correlation between the capturing antigen component of the test and bNAb reactivity

- At 100 µg/ml, all bNAbs were OQ-non-reactive and yielded no control line reactivity (“invalid”) with G4 and INSTI

- The lowest concentration detected was 0.25 mg/mL with OQ

Conclusions

- The widely used screening tests BRC, DC, Uni-gold, and DPP were nonreactive against bNAbs, supporting their use to distinguish individuals with true HIV-1 infection from those who have received immunophrophylaxis

Acknowledgement

The following reagents were obtained through the NIH AIDS Reagent Program, Division of AIDS, NIAID, NIH: VRC01, 10E8 from Brian Kuhner; VRC01, 10E8, 12294 from Jinghe Huang, Leo Laub, Mark Connors; PGT121, 12343 and PGT145, 10-1074 from Michael C. Nussenzweig; 10E8V4 from Peter Duesberg; and N6, 10E8 from Mark Connors.

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Table 2. SureCheck reactivity to diluted bNAbs.

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Results highlighted the need to establish an appropriate diagnostic strategy to identify HIV infection prior to the clinical use of bNAbs

Table 1. Test results including targeted epitope for each test. Uni-Gold and DC showed control line reactivity with PBS alone. Ags = antigens, NR = Nonreactive, R = Reactive, IND = Indeterminate. *Test line was very reactive while nonreactive for the control line.

Objective

We investigated the reactivity of bNAbs in several screening and supplemental HIV tests to better inform diagnostic testing during the clinical development of bNAbs for prevention.

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