

DELAYED HIV-1 SEROCONVERSION IN AN INDIVIDUAL RECEIVING PRE-EXPOSURE PROPHYLAXIS (PrEP) – A CASE STUDY

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BACKGROUND/AIMS & METHODS:

- The use of pre-exposure prophylaxis (PrEP) is providing new challenges to the laboratory diagnosis of recently acquired HIV-1 infection due to the interruption of viral replication dynamics and the immune response to infection
 - This results in a delay to a positive HIV-1 western blot, and the inability to detect HIV-1 viral nucleic acid (RNA and DNA) which may lead to a falsely negative overall result interpretation
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- We describe the case of delayed HIV-1 seroconversion observed in an individual receiving PrEP who presented for routine HIV-1 antibody screening
 - An initially reactive HIV-1 antibody sample was referred to the NSW State Reference Laboratory for HIV, St Vincent's Hospital, Sydney, which gave an overall indeterminate result, although the western blot profile was highly suggestive of HIV-1 seroconversion
 - Follow up samples were requested for confirmatory testing, including viral nucleic acid (RNA and DNA) and a drug resistance profile
 - Clinical information was conveyed to the laboratory that the patient had resumed PrEP after a brief adherence interruption

Result	Sample Day 0	Sample Day 7	Sample Day 42	Sample Day 44	Sample Day 56^
HIV-1/2 Ab/Ag x 2	Ab Reactive Ag Non-reactive	Ab Reactive Ag Non-reactive	Ab Reactive Ag Non-reactive	Ab Reactive Ag Non-reactive	Ab Reactive Ag Non-reactive
HIV-1 Proviral DNA	Not tested	Not Detected	Detected	Detected	Not tested
HIV-1 Western Blot	gp160 Trace p55 1+ p40 Trace p24 1+ p18 Trace	gp160 1+ p55 1+ p40 Trace p24 1+	gp160 Trace gp120 Trace p55 1+ p40 Trace p24 2+ p18 Trace	gp160 Trace gp120 Trace p55 1+ p40 1+ p24 2+ p18 Trace	gp160 Trace gp120 Trace p55 1+ gp41-45 Trace p40 1+ p24 2+ p18 Trace
Overall HIV-1 Interpretation	Indeterminate	Negative (PRV ND)	Positive 2 ENV glycoproteins	Positive 2 ENV glycoproteins	Positive 3 ENV glycoproteins
HIV-1 VL	Not tested	<20 copies/mL *	421 copies/mL	432 copies/mL	19,116 copies/mL
HIV-1 Drug Resistance	Not tested	Not tested	Not tested	NRTI: M184V NNRTI: K103N	NRTI: M184V NNRTI: K103N

- * Day 7 HIV-1 Viral load tested retrospectively. Note: HIV-1 VL assays are not registered for the confirmation of HIV-1 infection
- NRTI M184V cause high-level in vitro resistance to FTC (emtricitabine) which is one of the two anti-retroviral components of PrEP and 3TC (lamivudine)
- ^Sample Day 56 patient had discontinued PrEP

CONCLUSIONS/IMPLICATIONS:

- Specimens with indeterminate serology and undetectable HIV-1 nucleic acid tests may suggest a delayed HIV-1 seroconversion in individuals receiving antiretroviral therapy such as PrEP
- Laboratories and clinicians should be alerted that such results should be followed up with subsequent samples and a detailed clinical history