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HIV serologic reactivity in persons with HIV who started ART during acute/early stages of infection

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BACKGROUND

- Persons with HIV (PWH) who receive antiretroviral treatment (ART) beginning in acute/early stages of infection may fail to develop antibody reactivity or revert to nonreactive levels on serological assays,
- **Seroreactivity after prolonged viral suppression in PWH treated in acute/early stages of infection has not been previously characterized.**

METHODS

- **RV254** cohort study identified **PWH with recent HIV acquisition** in Bangkok using an antigen (Ag)/antibody (Ab) combo-assay, with subsequent testing of nonreactive samples using a nucleic acid test (NAT) and testing of reactive samples with a less sensitive Ab-only assay.
- Participants with reactive results on the Ag/Ab assay and nonreactive results on the Ab-only assay, and those with nonreactive results on the Ag/Ab assay and reactive results in the NAT were included, **categorized according to Fiebig stage, and offered immediate ART** with longitudinal follow-up.
- We obtained plasma samples collected at the **latest available timepoints after ART initiation** to investigate **evolution of seroreactivity using the Ortho VITROS HIV Ag/Ab Combo assay**, according to Fiebig stage at ART initiation.

ART initiation at acute/early stages after HIV acquisition suppressed antibody reactivity, limiting HIV detectability by licensed diagnostic serologic assays for years following infection

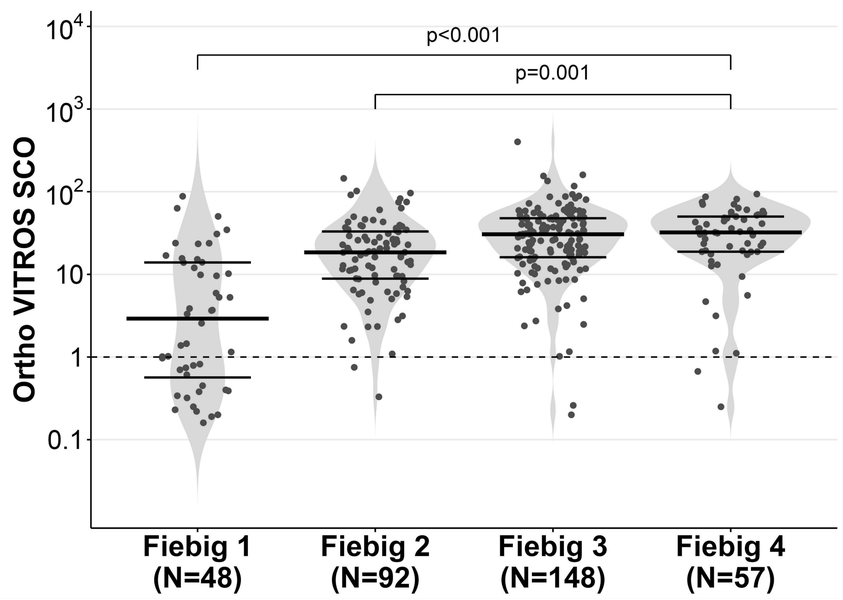


Figure 1: HIV seroreactivity 96-480 weeks after ART initiation in PWH who started ART during acute/early infection stages, by Fiebig stage at ART initiation.

RESULTS

- 345 participants with **samples collected between 96 and 480 weeks after ART initiation** were included.
- Most samples (64%) were collected at 336 weeks (6.5 years) after ART initiation.
- At ART onset, 48, 92, 148, and 57 participants were categorized at Fiebig stages 1, 2, 3, and 4, respectively.
- Overall, **24 participants (7%) had nonreactive Ag/Ab results; percentages with nonreactive serology were 38%, 2%, 1%, and 4% among participants with ART initiation at Fiebig stages 1, 2, 3, and 4, respectively** (p<0.001).
- Serology test results are shown in **Figure 1**. We found **progressively lower signal-to-cutoff readouts for participants starting ART at earlier Fiebig stages**, with statistical significance comparing Fiebig 1 vs. Fiebig 4 (p<0.001), and Fiebig 2 vs. Fiebig 4 (p=0.001).

CONCLUSIONS

- **ART initiation at acute/early stages after HIV acquisition can suppress antibody reactivity for years following infection**, limiting HIV detectability by licensed diagnostic serologic assays.
- This **impact of early ART on diagnostic test sensitivity** is particularly problematic but **not limited to PWH who initiate ART in Fiebig stages 1 and 2**, before the emergence of Ab responses.
- **Implications include false negative serologic diagnostic testing in clinical settings**, including blood donation screening.
- Further investigation is needed to develop and optimize appropriate testing assays and algorithms in this context

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