IMMUNE & VIROLOGIC TRAJECTORIES 1.5 YEARS BEFORE AND AFTER COVID-19 IN AN EARLY-TREATED HIV COHORT

INHCC International NeuroHIV Cure Consortium

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BACKGROUND

- SARS-CoV-2 infection can be associated with immunologic dysfunction and might serve as a 'second hit' to immune function in people with HIV (PWH) despite suppression with antiretroviral therapy (ART)
- We examined the trajectory of immunologic and virologic parameters 1.5 years pre- and post-COVID-19 in the RV254 acute HIV infection (AHI) study in Thailand

METHODS

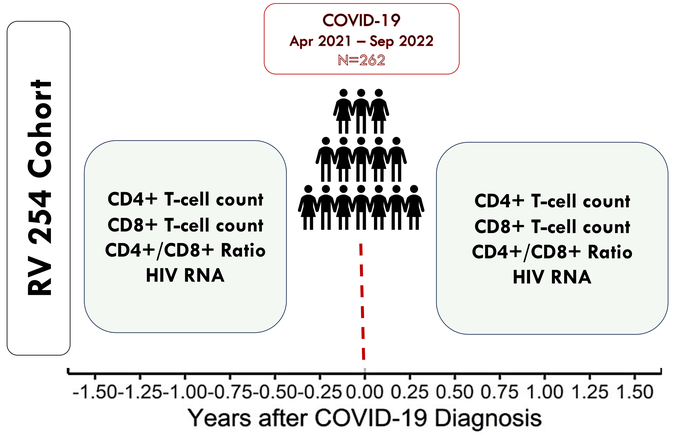
Participants

- RV254/SEARCH010 participants on ≥ 48 weeks of stable ART who were diagnosed with COVID-19 between April 2021 and September 2022 (n=262)

Parameters of Interest

- CD4+ T-Cell Count & CD8+ T-Cell Count
- CD4+/CD8+ T-cell Ratio
- Rates of detectable HIV RNA (>50 copies/L)

Study Design



Statistical Analysis

- immunologic measures from **1.5 years pre- and post-COVID-19** were regressed on time using linear mixed models.
- Time in years since COVID-19 diagnosis was entered as a linear spline with knots at the time of COVID-19 diagnosis and 0.25-year intervals thereafter; each timepoint after diagnosis was compared with the value at the time of diagnosis
- Rates of detectable viral load (>50 copies/ml) before and after COVID-19 diagnosis were compared using Poisson regression generalized estimating equations.
- Statistical analyses were performed using SAS Studio, version 3.8 (Cary, NC), and RStudio, version 4.2.2.

In a cohort of PWH on suppressive ART, there are mild but significant declines in the trajectory of CD4+ T-cell count and CD4+/CD8+ T-cell ratio up to one year after COVID-19

RESULTS

Table 1 Characteristics of RV254 participants with COVID-19 between April 2021 and September 2022

Characteristics	N=262
Age at COVID-19 diagnosis, *median (IQR)*	32 (29 - 38)
Male, n (%)	254 (97%)
COVID-19 vaccine doses received prior to COVID-19 diagnosis, n (%)	
0-1	40 (15%)
2-3	185 (69%)
≥ 4	44 (16%)
Time period diagnosed (predominant variant of concern), n (%)	
Sep 2020 – Mar 2021	1 (0%)
Apr 2021 – June 2021 (Alpha/beta)	13 (5%)
Jul 2021 – Dec 2021 (Delta)	35 (13%)
Jan 2022 – Sep 2022 (Omicron)	213 (81%)
Supplemental Oxygen	4 (1.5%)
Intensive Care Admission	1 (0.4%)
Mortality	0 (0%)

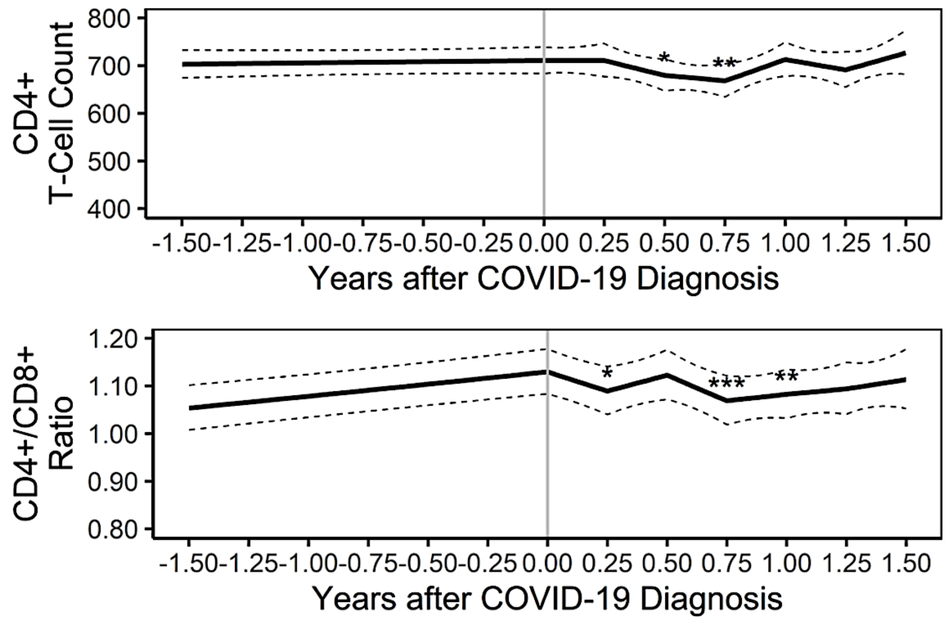


Figure 1. Trajectory of Immunologic Parameters (CD4+ T-Cell Count and CD4+/CD8+ T-cell ratio) 1.5 years before and after COVID-19. *p<0.05, ** p<0.01, ***p<0.0001
Note: Values at 0.25, 0.50, 0.75, 1.00, 1.25 years were compared to values at 0.00

SUMMARY OF FINDINGS

- Between Apr 2021 and Sep 2022, **262** participants on >48 weeks of stable ART were diagnosed with COVID-19
  - 81% (n=213) had COVID-19 during the Omicron wave
  - 85.5% (n=224) received ≥2 doses of COVID-19 vaccines prior to diagnosis
  - 4 (1.5%) required supplemental oxygen
- Compared with values at the time of COVID-19 diagnosis, there were **significant declines** in the trajectory of:
  - **CD4+ T-cell count** (710.77) at **6** (679.62, p=0.03) and **9 months** (668.14, p=0.008)
  - **CD4+/CD8+ T-cell ratio** (1.13) **at 3** (1.07, p<0.001) and **12 months** (1.08, p-=0.006)
- **Rates of detectable HIV RNA decreased post-COVID** (5.6% vs. 2.2%, p=0.04)
- **CD8+ T-cell count was stable** over 12 months post-COVID

CONCLUSIONS

- In this cohort of young, mostly male, virally-suppressed PWH who initiated ART during AHI, we observed **mild but significant changes** in the trajectory of CD4+ T-cell count and CD4/CD8 ratio **up to one year after COVID-19.**
- **CD8+ T-cell count remained stable** up to 1-year post-COVID-19
- **Detectable viral load rates decreased** post-COVID-19
- Longer follow-up and additional studies to disentangle the effects of COVID-19 vaccination and reinfections are ongoing to determine the impact of COVID-19 on the immunologic and virologic outcomes in PWH.

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DISCLAIMER

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