Prevalence and risk factors of HIV viral blips in the NA-ACCORD, 2010-2020

1175

Raynell Lang[1], Morris Chan[2], Jintong Yan[2], Michael A. Horberg[3], Jennifer Lam[4], Vincent C. Marconi[5], Keri N. Althoff[6], Joseph Eron[7], Kelly A. Gebo[6], M John Gill[1], Maile Karris[8], Mona Loutfy[9], Haidong Lu[10], Richard D. Moore[6], Viviane D. Lima[2], for the North American AIDS Cohort Collaboration on Research and Design

[1]University of Calgary, Calgary, AB, Canada, [2]University of British Columbia, Vancouver, BC, Canada, [3]Kaiser Permanente Mid-Atlantic Permanente Research Institute, Washington, DC, USA, [4]Kaiser Permanente Northern California, Pleasanton, CA, USA, [5]Emory University, Atlanta, GA, USA, [6]Johns Hopkins University, Baltimore, MD, USA, [7]University of North Carolina at Chapel Hill, Chapel Hill, NC USA, [8]University of California San Diego, San Diego, CA, USA, [9]Women's College Research Institute, Women's College Hospital, Toronto, ON, Canada, [10]Yale University, New Haven, CT, USA

BACKGROUND

- Despite effective antiretroviral therapy (ART), HIV viral blips defined as a viral load between 51-999 cp/mL (preceded and followed by <50 cp/mL at least 1 to 12 months apart) occur among people with HIV (PWH).
- Within the North American AIDS Cohort Collaboration on Research and Design (NA-ACCORD), we aimed to describe the prevalence and risk factors associated with experiencing at least one viral blip.

METHODS

- **Study Population:** U.S. and Canadian PWH ≥18-years old in the NA-ACCORD with at least two HIV viral load measures during the study period (1/1/2010-12/31/2020).
- **Primary Outcome**: HIV viral blip defined as a viral load between 51-999 cp/mL (preceded and followed by <50 cp/mL at least 1 to 12 months apart)
- **Study Entry:** the latest of the cohort open date, patient enrollment date, first suppressed viral load (<50 cp/mL) measured >12 months after ART initiation or 1/1/2010 .
- **Study Exit**: the earliest of viral blip (event), the last visit prior to a gap of >2 years without a CD4 count or viral load measurement (loss to follow-up), cohort close date, death or 12/31/2020).

Other Definitions:

- Virologic suppression: ≤ 50 cp/mL
- Low-level viremia: ≥ 2 consecutive viral loads of 51-199 cp/mL ≥30 days and 12 or less months apart.
- Isolated viremia 51-999 cp/mL for which LLV or blip could not be confirmed (LTFU or no further measurements within 12 months).
- Virologic failure: defined as VL ≥1000 copies/mL.

Statistical Analysis

- Logistic regression models estimated crude and adjusted odds ratios (aOR) and 95% confidence intervals to identify factors associated with experiencing a viral blip including sex, age race/ethnicity, BMI, HIV acquisition risk, ART regimen at the end of follow up, CD4 count at ART initiation, HIV viral load at ART initiation and year of ART initiation.
- All statistical analyses were conducted using SAS version 9.4

Nearly 25% of PWH experienced an HIV viral blip over the study period with blips being associated with sociodemographic and HIV factors. Due to their high prevalence, studies are needed to identify if blips are associated with subsequent HIV virologic failure and mortality.

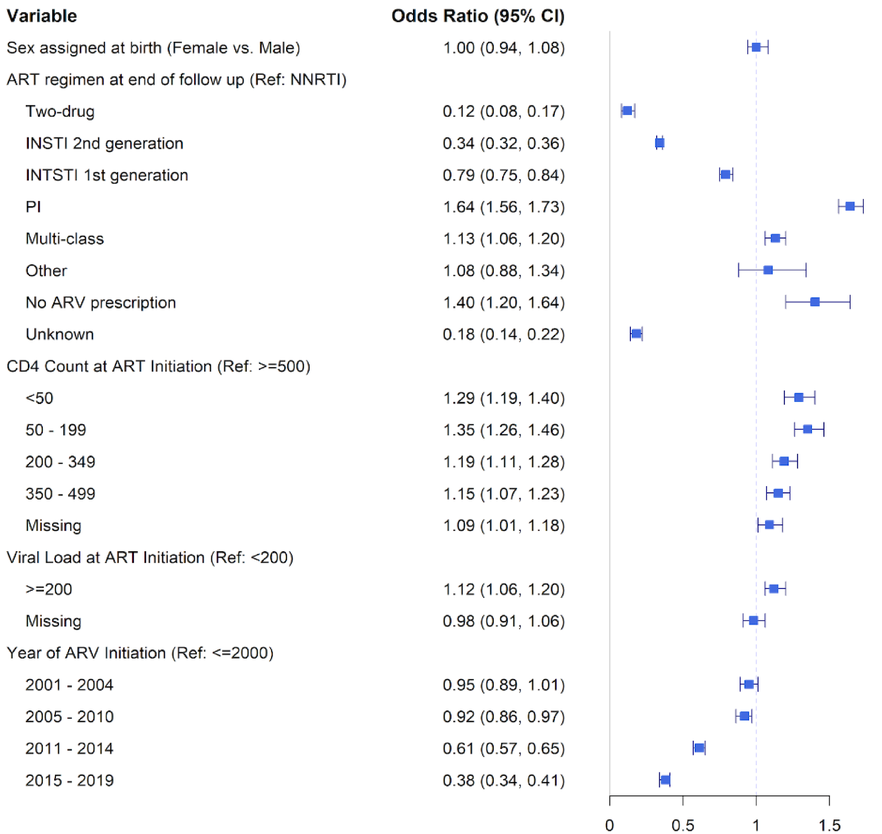


Figure: Multivariable logistic regression estimating the odds of experiencing at least one HIV viral blip between 2010 and 2020 among PWH in the NA-ACCORD. Adjusted for all factors included in this figure as well as race/ethnicity, BMI, HIV acquisition risk, age and NA-ACCORD cohort.

RESULTS:

- Among 77,670 PWH, 18,327 **(24%)** experienced a viral blip during the study period.
- Older age was associated with increased odds of viral blip (per 10-year increase in age: aOR=1.05 [1.03, 1.07]).
- The odds of a viral blip were higher among non-Hispanic Black (aOR=1.12 [1.07, 1.17]) and Hispanic (aOR=1.14 [1.07, 1.21]) PWH compared with non-Hispanic white PWH.
- PWH with lower CD4 cell counts and higher HIV viral loads at the time of ART initiation had greater odds of a viral blip (**Figure**).
- At study completion compared to PWH on non-nucleoside reverse transcriptase inhibitors (NNRTIs), those on integrase strand transfer inhibitors (INSTIs) had a reduced odds of blip, and those on protease inhibitors (PIs) had an increased odds of blip.
- We do not have measurements of ART adherence which may result in residual confounding and is a limitation of this work.

CONCLUSIONS

- Viral blips were common, occurring in nearly 1 in 4 PWH.
- Factors associated with viral blips included older age, race/ethnicity, CD4 count at ART initiation and ART regimen.
- Findings emphasize the need for personalized HIV care to address sociodemographic and clinical disparities.
- Future studies are needed to investigate the potential role of viral blips as predictors of virologic failure and mortality as well as inform strategies to minimize viral blips.

ADDITIONAL INFORMATION

- Contact: Raynell Lang, raynell.lang@ahs.ca

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