Cardiovascular Risk Assessment in Women Living With and Without HIV Using the PREVENT Model

832

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BACKGROUND

- Cardiovascular disease (CVD) risk in women living with HIV (WLWH) is shaped not only by **traditional risk factors** *(blood pressure, cholesterol)*, but also by **HIV-specific** *(immune activation, co-infections)* and **women-specific factors** *(hormonal fluctuations, disproportionate stress)*
- Primary prevention of CVD utilizes risk assessment models that show varying performance in WLWH. Predicting Risk of cardiovascular disease EVENTs **(PREVENT)** is a novel **race/ethnicity-free** sex-specific calculator that estimates 10-year and 30-year atherosclerotic cardiovascular disease (ASCVD), heart failure (HF), and composite CVD risks based on cardiovascular-metabolic-kidney disease risk factors and optional incorporation of social deprivation index (SDI, available in the US only).
- Here, we describe PREVENT-based CVD risk in women living with and without HIV.

METHODS

- British Columbia CARMA-CHIWOS Collaboration (BCC3) is a prospective cohort study enrolling women ≥16 years old living with and without HIV in British Columbia, Canada
- **Analysis inclusion criteria:**
  a) Recruited between December 2020 – February 2024
  b) Age 30-70 years old
  c) No history of coronary heart disease, stroke, or HF
- We used the **base PREVENT model** (without SDI)
- **10-year risk** of ASCVD, HF, and CVD (composite) were calculated for all eligible participants
- **30-year risk** estimates were calculated for women aged 30-59 years old
- Data used in the study were self-reported during BCC3 study visits or based on the study visit clinical blood tests
- Groups were compared by Chi-Squared or Mann-Whitney tests

Women living with HIV have higher 30-year risk of cardiovascular outcomes, but not 10-year risk compared to women without HIV based on a novel PREVENT cardiovascular risk estimator

RESULTS

The PREVENT base model revealed **no difference in 10-year risk** of ASCVD, HF, or CVD between the groups *(Figure 1),* but a **higher 30-year risk for ASCVD and CVD in WLWH** *(Figure 2)* compared to women without HIV

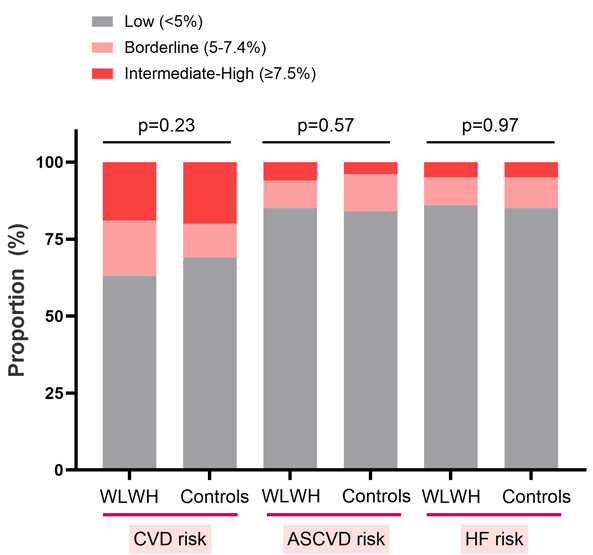


Figure 1. 10-year risk based on PREVENT in 164 women living with HIV and 187 women without HIV

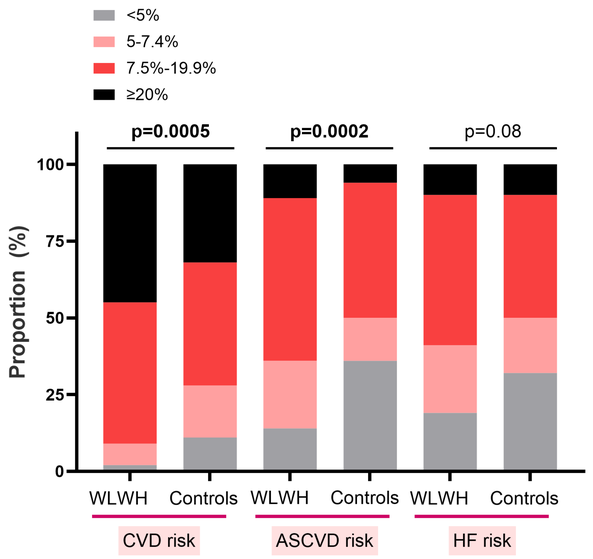


Figure 2. 30-year risk based on PREVENT in 140 women living with HIV and 151 women without HIV

Women with and without HIV (n=351) **shared many characteristics and CVD risk factors** *(all p>0.05):*

- **Age** (median [IQR] 49 [43-57] vs 50 [41-58] years
- **Current smoking** 40% vs 36%
- **Diabetes** 8% in both groups
- **Anti-hypertensive medication use** 16% vs 12%
- **Current substance use** 21% vs 21%

Body-mass index, blood pressure, and total cholesterol were also similar.

Women living with HIV were more likely to report a *history of hepatitis C* (38% vs 15%) and *use of lipid-lowering medication* (16% vs 5%), but had **lower** *high-density lipoprotein and estimated glomerular filtration rate* compared to women without HIV (all p<0.01)

CONCLUSIONS

- Despite similar 10-year ASCVD, HF, and CVD risk estimates, **women living with HIV showed higher 30-year risk** of CVD outcomes.
- This could reflect **long-term implications** of differences in lipids and kidney function
- The finding could also be associated with **factors not captured by PREVENT**, including higher exposure to adverse life events, chronic immune activation, and non-HIV chronic/latent viruses
- Future research should address:
  a) performance of PREVENT vs other calculators
  b) relationship between CVD risk and menopause
  c) independent correlates of elevated CVD risk

ADDITIONAL KEY INFORMATION

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