HIV INFECTION AND INCIDENT ABDOMINAL AORTIC ANEURYSM AMONG 143,327 VETERANS

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BACKGROUND

- People with HIV (PWH) have an increased risk of cardiovascular disease (CVD).
- A recent European cohort study reported that PWH have a 4-fold higher prevalence of abdominal aortic aneurysm (AAA) than those uninfected.
- There are no studies reporting incident rates or risk of AAA among PWH compared to uninfected people
- We evaluated the association between HIV infection and incident AAA in a large cohort of U.S Veterans.

METHODS

Study Sample: Veterans Aging Cohort Study (VACS), a prospective, longitudinal, observational cohort of PWH and matched 1:2 with veterans living without HIV infection. We excluded participants with prevalent AAA. We followed veterans from their first clinical encounter on or after 4/1/2003 until an AAA event, death, or last date of follow-up through 7/31/2017.

Exposure: HIV status, HIV viral load, and CD4+ T cell count.

Outcome: AAA or AAA repair defined using ICD-9/10 or CPT codes.

Covariates: Age, race and ethnicity, sex, CVD risk factors, statin use, important comorbidities, HIV specific biomarkers and ART.

Analysis: We calculated descriptive statistics by HIV status (**Table 1**) and plotted cumulative incidence of AAA by HIV status and age groups (**Fig. 1**). We constructed Cox proportional hazards regression models to estimate the risk of incident AAA among PWH compared to those without HIV and time-updated HIV viral load and CD4 T cell count (**Fig 2**). Similar models restricted to PWH were constructed to determine which clinical characteristics and CVD risk factors were associated with incident AAA (**Fig 3**).

HIV Infection was *not* associated with an overall increased risk of AAA; however, there was an *increased* risk in AAA among HIV+ veterans who had elevated HIV viral load or low CD4 cell counts over time.

RESULTS

Table 1. Baseline Characteristics

	HIV Infected (n=44,092)	HIV Uninfected (99,235)
Age, mean (SD)	49.6 (10.7)	50.6 (10.5)
Male, N (%)	42,876 (97.2)	96,418 (97.2)
Race, N (%)		
White	17,558 (39.8)	39.758 (40.1)
Black	21,108 (47.9)	46,837 (47.2)
Hispanic	3,497 (7.9)	8,416 (8.5)
Other	1,929 (4.4)	4,224 (4.3)
Smoking status, N (%)		
Current	17,023 (38.6)	35,256 (35.5)
Former	5,066 (11.5)	13,431 (13.5)
Never	8.979 (20.4)	22,861 (23.0)
Diabetes, N (%)	5,054 (11.5)	19,057 (19.2)
Prevalent CVD, N (%)	5,653 (12.8)	17,018 (17.1)
HCV Infection, N (%)		
HCV negative	28,779 (65.3)	63,155 (63.6)
HCV positive viral load	9,726 (22.1)	10,335 (10.4)
HCV positive antibody only	2,938 (6.7)	3,241 (3.3)
Never tested/ unknown	2,612 (5.9)	22,432 (22.6)
Body mass index, mean (SD), kg/m2	25.9 (4.9)	29.6 (6.1)
Hypertension, N (%)	24,502 (55.6)	66,905 (67.4)
LDL cholesterol, median (Q1, Q3), mg/dL	101 (79, 126)	112 (89, 137)
HDL cholesterol, median (Q1, Q3), mg/dL	40 (32,50)	43 (36,52)
Triglycerides, median (Q1, Q3), mg/dL	137 (92, 216)	124 (83,191)
Statin therapy, N (%)	7,877 (17.9)	31,280 (31.5)
HIV Specific Variables		
CD4 Cell Count Variables, median (Q1, Q3), cells/mm3	386 (210, 593)	--
HIV-1 RNA, median (Q1,Q3), copies/mL	1,004 (75, 33,975)	--
ART Regimen, N (%)		
NRTI + PI	17,090 (38.8)	--
NRTI + NNRTI	17,008 (38.6)	--
NRTI + NNRTI + PI & other combinations	1,289 (2.9)	--
No ART	18,419 (41.8)	--

Figure 1. Cumulative Incidence of AAA by HIV and Age

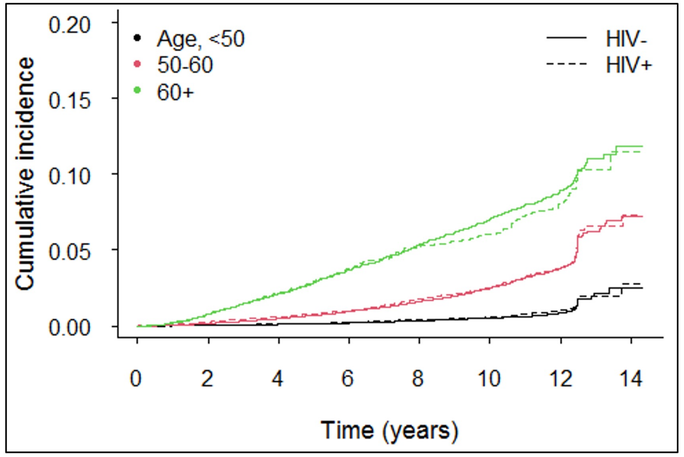
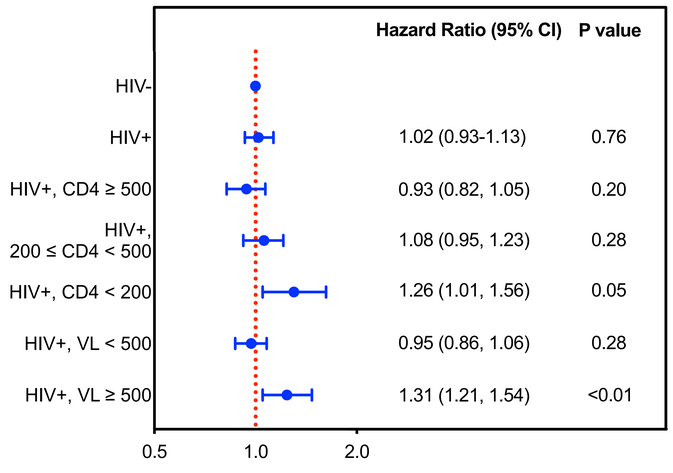
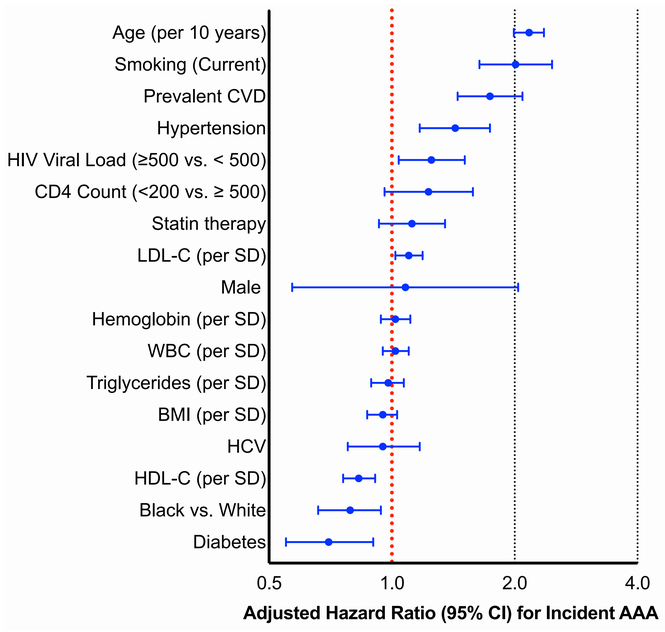


Figure 2. Risk of incident AAA by HIV status and time-updated HIV viral load and CD4 T cell count status



Models adjusted for age, sex, race, hypertension, diabetes, LDL-C, HDL-C, triglycerides, statin use, prevalent CVD, hepatitis C, smoking status, eGFR, hemoglobin, BMI, alcohol abuse. Missing values were imputed using multiple imputation. Stratification was performed using time-updated CD4 count and viral load.

Figure 3. Risk of Incident AAA by Clinical Characteristics and CVD risk factors Among Veterans with HIV



CONCLUSIONS

- HIV infection was not associated with an overall increased risk of AAA
- There was an increased risk in AAA among veterans with HIV who had elevated HIV viral load or low CD4 T cell counts over time
- Age, current smoking, history of CVD, hypertension and elevated HIV viral loads were most strongly associated with incident AAA among veterans with HIV

ADDITIONAL KEY INFORMATION

- **Limitations:** AAA outcome was not adjudicated, Majority of participants were male
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