Comparing Statin Prescribing Rates in Eligible HIV vs. non-HIV Infected Patients

Alison L. Blackman, PharmD, Neha Sheth Pandit, PharmD, BCPS, AAHIVP, Kathleen J. Pincus, PharmD, BCPS

Department of Pharmacy Practice and Science, University of Maryland School of Pharmacy, Baltimore, MD

ablackman@rx.umaryland.edu

BACKGROUND

- HIV-infected patients are at increased risk for atherosclerotic cardiovascular disease (ASCVD) compared to the general population.
- Many factors may contribute:
  - Systemic inflammation secondary to HIV infection.
  - Exposure to antiretroviral therapies (ART) with cardiac risk, specifically abacavir and certain protease inhibitors.
  - Increased likelihood for modifiable risk factors such as smoking and obesity.
- Gaps in therapy have been described:
  - 23-77% prescribing rates for HIV-infected individuals indicated for statin medications.
- Limited data available:
  - Since the release of the 2013 American College of Cardiology/American Heart Association (ACC/AHA) blood cholesterol guidelines.
  - Comparing statin prescribing rates between HIV-infected and uninfected patients.
    - 2 studies report HIV-infected patients less likely than uninfected patients to be prescribed a statin (15-24% vs. 24-36%).
- We aim to characterize statin prescribing rates for eligible HIV-infected individuals based on the 2013 ACC/AHA guidelines and compare these to rates in a similar population of uninfected adults.

METHODS

- **Study Design:** Retrospective, single center, comparative analysis of statin eligible adult patients with a clinic encounter between February 1, 2017 and September 30, 2017 at two outpatient clinics within the University of Maryland Medical System (UMMS)
- **Primary outcome:** Statin prescribing rate in eligible HIV-infected vs. uninfected patients
- **Secondary outcomes:**
  - Statin prescribing rate in each of the individual statin benefit groups
  - Statin intensity distribution for each statin benefit group

Inclusion criteria

Qualify for one of the four ACC/AHA statin benefit groups:
- History of clinical ASCVD
- LDL-C ≥ 190 mg/dL
- History of diabetes
  - Age 40-75 years old
  - LDL-C 70-189 mg/dL
- 10-year ASCVD risk score ≥ 7.5%
  - Age 40-75 years old
  - LDL-C 70-189 mg/dL

Exclusion criteria

- < 21 years old
- > 85 years old
- Most recent lipid panel > 3 years from start of study period

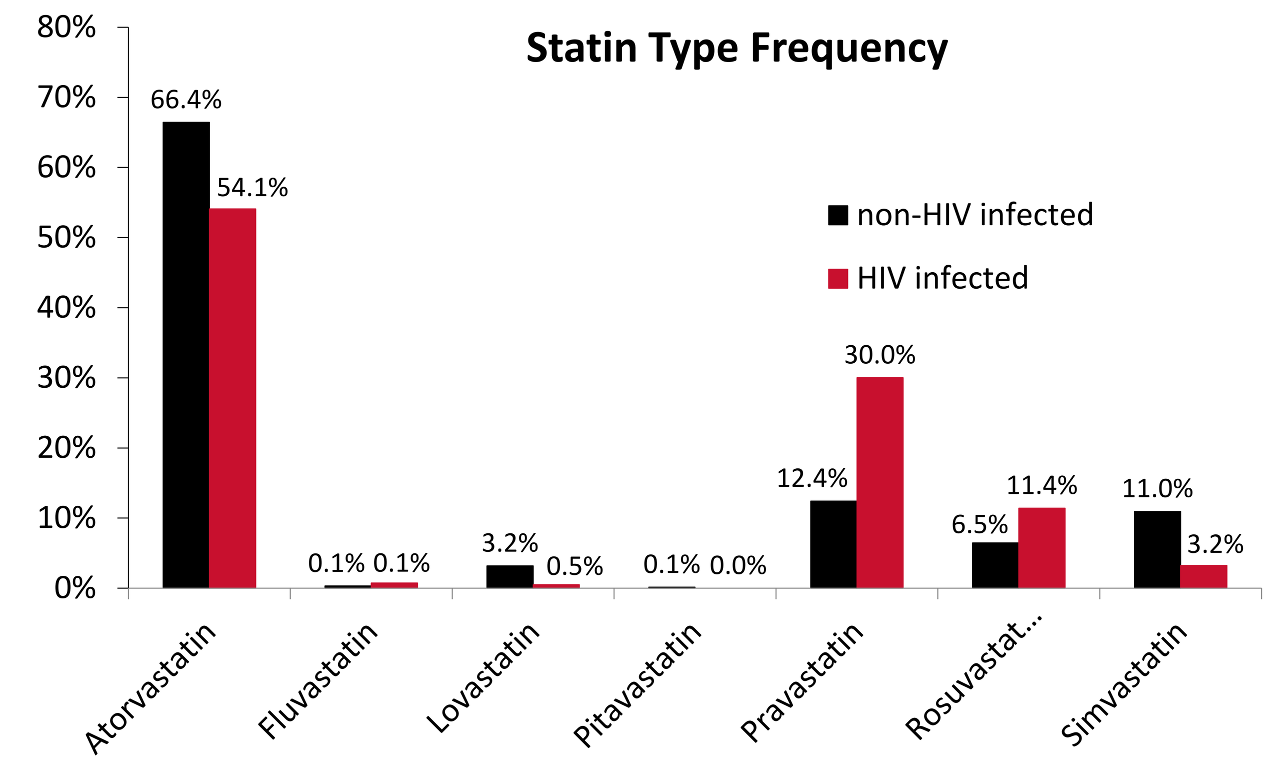
- **Statistical Analysis:**
  - Categorical variables compared using Pearson's χ2 or Fisher's exact tests.
  - Multivariate regression analysis to measure association of all predictors and outcomes.
  - Analysis conducted with SAS V 9.4 (SAS Instituted, Cary, NC).

RESULTS

Patient Demographics

Characteristic	All Patients (n=3147)	HIV Positive (n=908)	HIV Negative (n=2239)	*p* value
Age (years)	58.5 ± 9.7	57.2 ± 8.0	59.0 ± 10.2	< 0.001
Sex (male)	1442 (45.8)	585 (64.4)	857 (38.3)	< 0.001
Race				< 0.001
White/Caucasian	366 (11.6)	66 (7.3)	300 (13.4)	
Black/African American	2710 (86.1)	823 (90.6)	1887 (84.3)	
Other	71 (2.3)	19 (2.1)	52 (2.3)	
Clinic Location				< 0.001
Family Medicine Practice	2089 (66.4)	39 (4.3)	2050 (91.6)	
Center for Infectious Diseases	2058 (33.6)	869 (95.7)	189 (8.4)	
Smoking				< 0.001
Yes	1050 (33.4)	432 (47.6)	618 (27.6)	
No/Never	1040 (33.1)	194 (21.4)	846 (37.8)	
Other	1049 (33.3)	281 (30.9)	768 (34.2)	
Unknown	8 (0.2)	1 (0.1)	7 (0.4)	
HCV	403 (12.8)	216 (23.8)	187 (8.4)	< 0.001
ARVs with CVD Risk				
Abacavir	-	281 (30.9)	-	-
PI		171 (18.8)		
Both		71 (7.8)		
Primary Inclusion Criteria				< 0.001
Clinical ASCVD	974 (31.0)	246 (27.1)	728 (32.5)	
LDL-C ≥ 190	223 (7.1)	72 (7.9)	151 (6.7)	
Diabetes	929 (29.5)	184 (20.3)	745 (33.3)	
10-year ASCVD Risk ≥ 7.5%	1021 (32.4)	406 (44.7)	615 (27.5)	

Statin Type Frequency

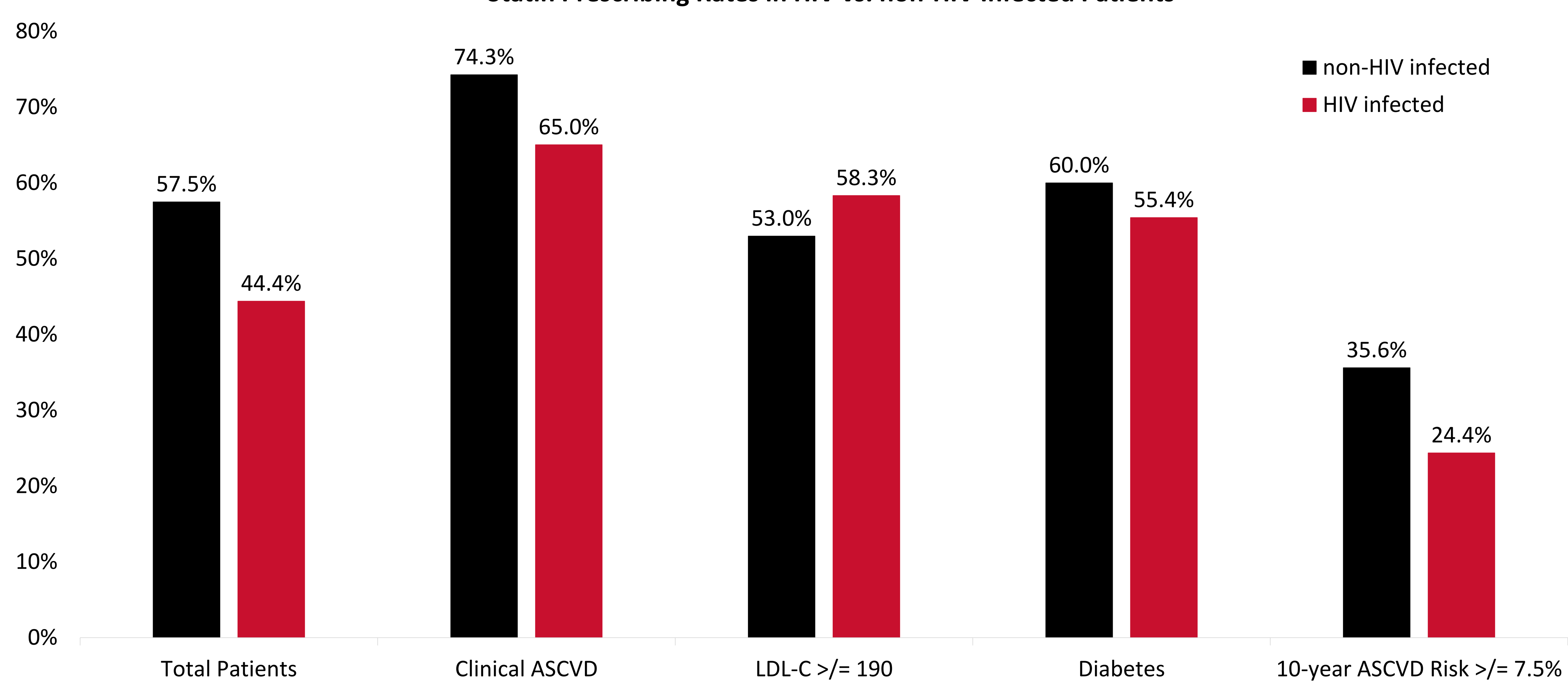


Patient Characteristics Associated with Statin Prescription

Characteristic	Adjusted OR	95% Confidence Interval
Older Age	1.05	1.03 – 1.06
HIV-infected	0.79	0.66 – 0.94
HCV-infected	0.62	0.48 – 0.78
Smoking		
Yes	Reference	Reference
Former	1.21	0.99 – 1.47
No	0.80	065 – 0.97
Patient Inclusion		
Clinical ASCVD	Reference	Reference
LDL-C ≥ 190	0.68	0.49 – 0.93
Diabetes	0.67	0.55 – 0.83
10-year ASCVD Risk ≥ 7.5%	0.18	0.14 – 0.22

HCV = hepatitis C; ARV = antiretroviral agents; CVD = cardiovascular disease; PI = protease inhibitor(s); ASCVD = atherosclerotic cardiovascular disease; LDL-C = low density lipoprotein cholesterol

Statin Prescribing Rates in HIV vs. non-HIV Infected Patients



Total Patients	Clinical ASCVD	LDL-C >/= 190	Diabetes	10-year ASCVD Risk >/= 7.5%
Adj OR 0.79 [0.66 – 0.94]	Adj OR 0.76 [0.54-1.06]	Adj OR 1.08 [0.58 – 2.0]	Adj OR 0.88 [0.61 – 1.25]	Adj OR 0.68 [0.5 – 0.92]

RESULTS

Statin Intensity Distribution

Statin Intensity	All Patients (n=1689)	HIV Positive (n=403)	HIV Negative (n=1286)
All Patients			
High intensity	766 (45.3)	106 (26.3)	660 (51.3)
Medium intensity	786 (46.5)	238 (59.1)	548 (42.6)
Low intensity	137 (8.2)	59 (14.6)	78 (6.1)
Clinical ASCVD			
High intensity	405 (57.9)	58 (36.2)	347 (64.3)
Medium intensity	252 (36.0)	83 (51.9)	169 (31.3)
Low intensity	43 (6.1)	19 (11.9)	24 (4.4)
LDL ≥ 190			
High intensity	52 (42.6)	9 (21.4)	43 (53.7)
Medium intensity	66 (54.1)	31 (73.8)	35 (43.7)
Low intensity	4 (3.3)	2 (4.8)	2 (2.5)
Diabetes			
High intensity	218 (39.7)	16 (15.7)	202 (45.2)
Medium intensity	275 (50.1)	66 (64.7)	209 (46.8)
Low intensity	56 (10.2)	20 (19.6)	36 (8.0)
10-year ASCVD Risk ≥ 7.5%			
High intensity	91 (28.6)	23 (23.2)	68 (31.1)
Medium intensity	193 (60.7)	58 (58.6)	135 (61.6)
Low intensity	34 (10.7)	18 (18.2)	16 (7.3)

- HIV infected patients are more likely to be prescribed a medium intensity statin vs. non-HIV infected patients, which are more likely to be prescribed a high intensity statin (Adj OR = 0.35 [0.26 – 0.46])

CONCLUSIONS

- HIV infected patients are less likely to be prescribed statin therapy compared to uninfected patients (Adj OR 0.79 [0.66 – 0.94]).
- When adjusting for baseline characteristics, there is no difference in statin prescribing rates in HIV infected vs. uninfected patients with a history of clinical ASCVD, LDL-C ≥ 190 mg/dL, or diabetes. In patients with a 10-year ASCVD risk score ≥ 7.5%, HIV infected patients are less likely to be prescribed a statin vs. non-HIV infected patients.
- Predictors of statin therapy in the total population include active smoking status, older age, non-HIV status, and non-HCV status.
- HIV infected patients are more likely to be prescribed a medium intensity statin vs. non-HIV infected patients, which are more likely to be prescribed a high intensity statin.

DISCLOSURES

The authors have no actual or potential conflicts of interest in relation to the content of this presentation

REFERENCES

1. Clement ME, et al. Statin utilization and recommendation among HIV- and HCV-infected veterans: a cohort study. *Clin Infect Dis*. 20016;63(3):407-13.
2. Althoff KN, et al. The large gap between statin eligibility and prescription among HIV+ in North America. Conference on Retroviruses and Opportunistic Infections (CROI). February 13-16, 2017. Seattle, WA. Abstract 619.
3. De Socio GV, et al. Statins and aspirin use in HIV-infected people: gap between European AIDS clinical society guidelines and clinical practice: the results from HIV-HY study. *Infection*. 2016;44(5):589-97.
4. Okeke NL, et al.. Coronary artery disease risk reduction in HIV-infected persons: a comparative analysis. *AIDS Care*. 2016;28(4):475-82.
5. Kelly SG, et al. Statin prescribing practices in the comprehensive care for HIV-infected patients. *J Acquir Defic Syndro*. 2017;76(1):e26-9.
6. Ali N, et al. Statin utilization among human-immunodeficiency virus (HIV)-infected individuals based on the 2013 American College of Cardiology and American Heart Association (ACC/AHA) blood cholesterol guideline. ID Week. October 5, 2017. San Diego, CA.
7. Levy E, et al. Evaluation of statin eligibility, prescribing practices, and therapeutic responses using ATP III, ACC/AHA, and NLA dyslipidemia treatment guidelines in a large urban cohort of HIV-infected outpatients. *AIDS Patient Care STDS*. 2018;32(2):58-69.