2013 ACC/AHA Guideline Undertreats HIV-Infected Adults With Atherosclerosis

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Introduction

- HIV infection is associated increased risk of atherosclerotic cardiovascular disease (ASCVD)
- Traditional risk factors fail to accurately predict ASCVD risk in HIV-infected subjects
- Statin recommendations by the 2013 ACC/AHA cholesterol guidelines are based upon traditional ASCVD risk factors
- ACC/AHA cholesterol guidelines may not recommend statins to HIV-infected subjects at high ASCVD risk
- Use of carotid ultrasound to identify atherosclerotic plaque and measure intima-media thickness (IMT) is a non-invasive and validated method to identify subclinical atherosclerosis

Aims

1. Compare the rate of statin recommendations using the 2004 Adult Treatment Panel (ATP) III guidelines and 2013 ACC/AHA guidelines in HIV-infected adults
2. Assess presence of carotid atherosclerosis by carotid ultrasound in HIV-infected adults
3. Evaluate the association of statin recommendations with carotid atherosclerosis by ultrasound in HIV-infected adults

Methods

- 352 HIV-infected adults without a history of ASCVD and not on statin therapy at baseline were included in the study
- Recommendation for statin therapy was determined using the 2004 ATP III guidelines and 2013 ACC/AHA guidelines
- Carotid B-mode ultrasound using 10-MHz linear-array probe with the GE VividFive Imaging System was performed at baseline and 3 years later
- Carotid IMT was measured in 12 predefined segments (6 per side). Carotid plaque was defined as carotid IMT > 1.5 mm at any site.
- McNemar's test used to compare % subjects recommended for statin based upon ATP III and ACC/AHA guidelines. Linear regression analysis was used to show independent factors associated with plaque and statin recommendations.

Results

Table 1. Baseline characteristics (median, IQR) of HIV-infected adults stratified by statin recommendation based upon ACC/AHA guidelines.

	Statin (-) (n=259)	Statin (+) (n=93)	P-value
Demographic			
Age, years	43 (39, 49)	53 (49, 57)	<0.0001
Race			0.01
Caucasian	61%	53%	
African American	25%	35%	
Latino	12%	5%	
Gender			
Male	85%	92%	0.08
Female	14%	5%	
BMI, kg/m2	25.2 (23.3, 28.6)	25.2 (22.5, 28.4)	0.74
SBP, mmHg	120 (113, 128)	125 (119, 135)	<0.0001
DBP, mmHg	74 (68, 80)	78 (72, 83)	0.01
HIV factors			
HIV duration, yr	11 (5, 17)	15 (10, 20)	<0.0001
Nadir CD4, cells/uL	21 (6, 38)	18 (9, 30)	0.46
Cur CD4, cells.uL	4.6 (2.8, 6.6)	4.2 (2.5, 6.6)	0.45
Treated suppressed	106 (41.3)%	42 (45.2%)	
PI, yr	0.5 (0, 4.5)	2.8 (0, 5.7)	0.05
HAART, yr	2.3 (0, 5.6)	3.8 (0, 6)	0.17
Hepatitis C	23.9%	28.0%	0.44
Lipodystrophy	41.7%	58.1%	0.01
Comorbidities			
Family history	23.6%	16.1%	0.14
Hypertension	17.0%	41.9%	<0.0001
DM	1.2%	10.8%	<0.0001
Any smoking	63.7%	77.4%	0.02
Aspirin use	8.9%	22.6%	0.001
Labs			
Cholesterol, mg/dL	177 (150, 205)	194 (166, 217)	0.01
LDL-C, mg/dL	103 (82, 123)	106.5 (90, 138)	0.06
HDL-C, mg/dL	43 (36, 51)	39 (30, 48)	0.001
Triglyceride, mg/dL	121 (80, 193)	160 (98, 283)	0.003
hs-CRP, mg/L	1.7 (0.7, 3.9)	1.9 (0.6, 4.5)	0.78
Glucose, mg/dL	86 (81, 93)	89 (80, 99)	0.10
Risk			
Fram risk factors	1 (1, 2)	3 (2, 3)	<0.0001
10-yr Fram risk	3% (1, 5)	10% (8, 14)	<0.0001
10-yr ASCVD risk	3.6% (2, 5.1)	10.5% (8.7, 13.4)	<0.0001

Results

Table 2. 2013 ACC/AHA guidelines are more likely to recommend statin therapy in HIV-infected adults compared with 2004 ATP 3 guidelines.

		ATP 3			P-value
		Not Recommended	Recommended	Total	
ACC/AHA	Not Recommended	238	21	259 (73.58%)	<.0001
	Recommended	66	27	93 (26.42%)	
	Total	304 (86.36%)	48 (13.64%)	352	

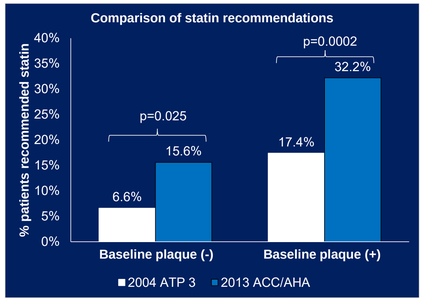


Figure 1. Both 2004 ATP III and 2013 ACC/AHA guidelines fail to recommend statin in a majority of HIV-infected adults with evidence of baseline carotid plaque.

Table 3. Older age, opportunistic infection, pack years of smoking, and LDL-C are independently associated with baseline carotid plaque.

	Prevalence Ratio	95% CI	P-value
Age (per decade)	1.41	1.14, 1.74	0.002
Opportunistic infection	1.53	1.18, 1.99	0.001
Pack yrs smoking (per 10)	1.05	1.00, 1.10	0.05
LDL-C (per doubling)	1.5	1.13, 2.00	0.005

Multivariate adjusted model that controls gender, race, and disease status

Results

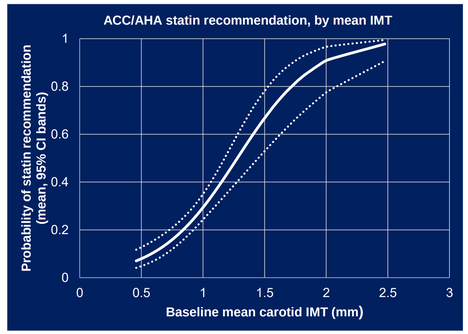


Figure 2. Greater carotid IMT is associated with increased probability of statin recommendation by the 2013 ACC/AHA guidelines in HIV-infected adults.

Conclusions

- ACC/AHA guidelines recommend statins to a higher percentage of HIV-infected adults compared to ATP III
- Both 2004 ATP III and 2013 ACC/AHA guidelines do not recommend statin therapy to a significant number of HIV-infected adults with evidence of carotid plaque by ultrasound
- Age, opportunistic infection, pack years of smoking, and LDL-C were independent predictors of baseline carotid plaque
- Though the probability of statin recommendation by the 2013 ACC/AHA guidelines increases with increasing carotid IMT, there remains a significant probability statins would not be recommended in adults with abnormal carotid IMT levels
- HIV-specific cholesterol guidelines that include detection of subclinical atherosclerosis may help to identify HIV-infected adults who are at increased ASCVD risk and who may benefit from statins

Disclosures: All authors report no conflicts of interest.