



## ABSTRACT

**Background:** Racial and ethnic minorities comprise an increasing proportion of the US population, and are disproportionately affected by HIV. Dyslipidemia is a key comorbidity in HIV due to high prevalence and demonstrated racial disparities in testing and treatment among non-HIV patients. Previous analysis has showed that HIV positive AA patients were less likely to have had a lipid profile done and also were less likely to have been diagnosed with dyslipidemia than other racial groups.

**Methods:** Electronic medical records (EMR) identified 1457 HIV patients from the HIV clinic at Henry Ford Hospital, Detroit, Michigan from March, 2013 to November, 2015. Race/ethnicity and gender were identified by self-report and then a retrospective EMR review of patients tested for, and documented ICD-9 codes for dyslipidemia was done. Descriptive analyses and group comparisons were performed between African American (AA) and other racial/ethnic groups.

**Results:** A total of 1220 HIV patients had lipid levels tested with 25.7% having dyslipidemia after HIV diagnosis. Among those, it was found that lipid abnormalities varied by race; on average, Hispanics, had lower total cholesterol (p-value 0.040), AA patients had lower triglycerides (p-value <0.001), and White patients had higher triglycerides (p-value >0.001). HDL levels were higher in AA patients and lowest in White patients (p-value <0.001), while Hispanics had lower LDL values (p-value 0.009). There was no statistically significant (p-value 0.519) difference between the lipid lowering drug (LLD) group prescribed by race, and the type of dyslipidemia was the primary predictor of LLD provided to the patients (p-values <0.001). HIV patients prescribed fibrates were statistically more likely to have met their ATP III treatment goals at 1 year as compared to statins, regardless of race (p-value 0.005). The odds of meeting treatment goals were 54% less among AA patients regardless of medication.

**Conclusion:** Dyslipidemia is prevalent in our HIV population. Racial differences in testing, lipid abnormalities and treatment outcomes among these vulnerable HIV minorities necessitate further investigation in order to close the gaps in care.

## INTRODUCTION

Racial minority groups are expected to reach 53% by 2050. HIV disease and therapy are associated with several metabolic complications and increased cardiovascular risk. Dyslipidemia is one of the most common of those complications and has been associated with several antiretroviral regimens.

Initiation of antiretroviral therapy (ART) is associated with increases in total cholesterol and triglycerides across populations when compared to HIV seronegative. The impact of ART on the extent of dyslipidemia tends to vary between self-reported racial populations. Previously presented analysis from this data has shown that the majority of our HIV patients were tested at least once for dyslipidemia during our study period and most developed dyslipidemia after their HIV diagnosis. Gaps in lipid profile testing were identified between genders and by ethnicity, with women and African American patients being tested less often. Further evaluation for cofactors associated with differences in testing is on going. Prevalence of dyslipidemia was higher in Whites than African American HIV seropositive patients, similarly to other cohorts. Small differences in treatment initiation were seen but did not reach statistical significance.

## ACKNOWLEDGEMENTS

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## OBJECTIVES

**Specific Aim 1:** Examine racial differences in the testing, incidence, and prevalence of dyslipidemia among HIV seropositive patients treated with ART.

**Specific Aim 2:** Determine if there are racial differences in prescription of lipid lowering therapy between HIV seropositive Caucasian, African-American and Hispanic patients.

**Specific Aim 3:** Examine racial disparities in the therapeutic response to lipid lowering therapy among HIV seropositive patients treated with ART who develop dyslipidemia.

## METHODS

- A retrospective cohort study of 1457 HIV patients presenting to the HIV clinic at Henry Ford Hospital, Detroit, Michigan from March 2013 to November 2015, was identified for chart review.
- Race and gender were identified by self-report. A retrospective EMR chart review of patients tested for and ICD-9 coded for dyslipidemia was performed.
- Dyslipidemia was classified according to Adult Treatment Panel III guidelines.
- Descriptive analysis was performed for all variables collected. Group comparisons using 2-sample t-test for normally distributed continuous data, and non-parametric data we utilized the Wilcoxon rank sum test, the chi-square test and the Fisher exact test.
- Odds ratios were used to compare 2x2 groupings. ANOVA was used when race was not dichotomized.

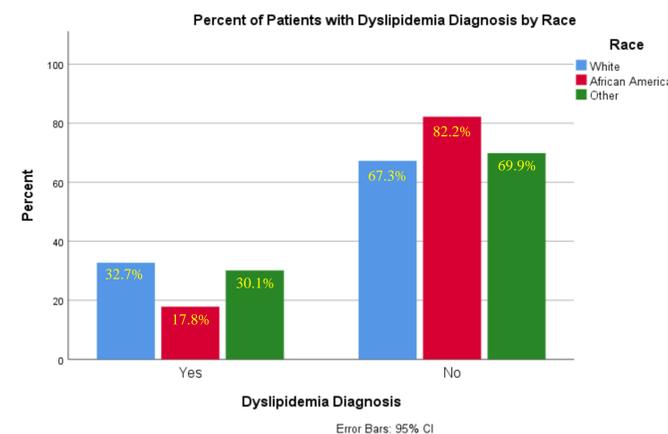
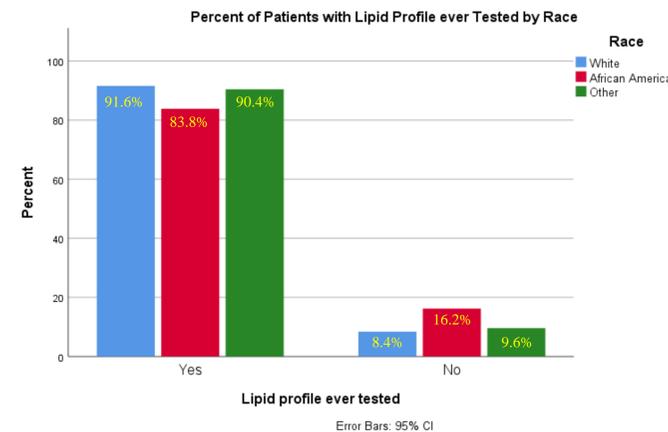
## RESULTS

- African-Americans were 51.5% (OR = 0.485, CI 0.335 – 0.693) less likely to have ever had a lipid profile done, Caucasians had a 104% (OR =2.04, CI 1.40 – 3.05) increase in the likelihood of having ever had a lipid. The population only had 20 Hispanic patients and all of them were tested.
- In all patients, dyslipidemia was identified as elevation in LDL in 31.5% of cases, triglycerides in 29.9% and/or low HDL in 15.4%.
- African-Americans were 54.6% (OR = 0.454, CI 0.354 – 0.582) less likely to have been diagnosed with dyslipidemia, Caucasians showed a 113% (OR = 2.13, CI 1.65 – 2.75) increase in having been diagnosed. Hispanics showed an increased likelihood of having ever been diagnosed with dyslipidemia of over 20 fold (OR = 20.5, CI 5.87 – 109.57). AA patients had DL less frequently than Whites, 25.2% vs. 44.6% (p-value <0.001).
- Hispanics had a significantly lower mean cholesterol with a p-value of 0.040 (Hispanic mean = 188.26, Others = 211.42).
- African-Americans had a significantly lower triglyceride levels (p-value <0.001), and Caucasians had significantly higher triglyceride levels (p-value <0.001).

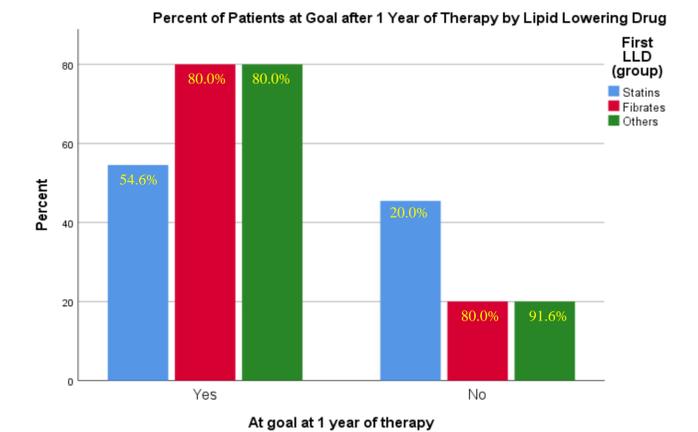
## RESULTS

Variable	Response	No dyslipidemia N (%)	Dyslipidemia N [Mean +/-SD] (%)	P-Value
Age N [Mean +/-SD]		1080 [43.9 +/-12.6]	376 [54.5 +/-10.6]	<0.001
Race	White	215 (21.2%)	114 (39.7%)	N/A
	AA	761 (75.1%)	197 (54.3%)	
	Hispanic*	3 (0.3%)	17 (4.7%)	
	American Indian/Alaska Native*	15 (1.5%)	0	
	Other races/NA*	13 (1.3%)	0	
Race (regrouped)	White	215 (21.2%)	144 (39.7%)	<0.001
	AA	761 (75.1%)	197 (54.3%)	
	Other	38 (3.8%)	22 (6.1%)	
BMI N [Mean +/-SD]		1074 [26.7 +/-6.2]	372 [27.6 +/-6.1]	0.010
BMI (grouped)	<18.5	33 (3.1%)	14 (3.8%)	0.001
	18.5-24.9	457 (42.6%)	155 (30.9%)	
	25-29.9	358 (33.3%)	145 (39.0%)	
	>=30	226 (21.0%)	98 (26.3%)	
Lipids tested	No	236 (21.9%)	1 (0.3%)	<0.001
	Yes	844 (78.1%)	376 (99.7%)	

For analysis, all races marked with an \* were grouped into Other



- Race did not impact the LLD therapy prescribed (p-value 0.519, Chi-square), no difference in prescriptions was detected.
- Dyslipidemia was not associated with BMI and 69.9% of dyslipidemia patients had a BMI between 18.5-29.9.
- The type of LLD prescribed had an impact for patients meeting treatment goals and there was a statistically significant (p-value 0.044) association found. Most patients prescribed a fibrate were likely to reach treatment goals.



## CONCLUSIONS

- Race was strongly associated with decision for testing, the type and prevalence of dyslipidemia, and likelihood of being treated.
- Dyslipidemia was more commonly diagnosed by increase in LDL in 31.5% of tested patients.
- BMI did not correlated with incidence of dyslipidemia and most cases had a BMI below 29.9 and should not bias physicians against testing.
- Treatment selection was guided by lipid abnormalities and not influenced by race.
- Type of dyslipidemia, hypertriglyceridemia, and therefore the prescribed treatment was the strongest predictor of whether or not a patient met ATP III treatment goals at 1 year, than other dyslipidemia types.

## CITATIONS

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