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Association Between Substance Use Disorder and Sustained Viral Suppression Among People With HIV

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HIGHLIGHTS

- Substance use disorders, such as alcohol use, illicit drug use, and tobacco use were less likely to maintain sustained viral suppression among PWH.
- PWH with chronic diseases such as cardiovascular diseases, renal disease, liver disease, etc. tend to have higher probability to maintain viral suppression.

BACKGROUND

- Substance use disorder is an increasing problem among the population in many states of the US and is a potential risk factor for suboptimal viral suppression among people with HIV (PWH). This study aims to examine the association between substance use disorder and sustained viral suppression among PWH.

METHODS

- Electronic health record (EHR) data from the South Carolina Department of Health and Environmental Control (DHEC) was used to identify eligible adult (≥18 years old) PWH who were diagnosed with HIV between 01/01/2006 and 12/31/2019.
- Sustained viral suppression was defined as consecutive suppressed viral load tests (≤ 200 copies/mL) within one calendar year. Impact of substance use disorder on sustained viral suppression was evaluated by generalized linear mixed model.
- Substance consumption encompassed the use of tobacco, alcohol, and illicit drugs was identified based on the associated ICD-9/10 diagnostic codes during the study's duration.
- Potential confounders included age, sex, and chronic diseases history such as cancer, dementia, diabetes, etc.
- Generalized linear mix model (GLMM) was applied to evaluate the association between sustained VS and substance use disorder as well as other potential confounders.

RESULTS

- Among 9334 eligible participants, 7477 (80.10%) of them had reached sustained viral suppression status during their follow up periods.
- Substance use disorders, such as alcohol use (AOR=0.55, 95%CI: 0.48-0.63), illicit drug use such as cannabis (AOR=0.64, 95%CI: 0.54-0.76), cocaine (AOR=0.53, 95%CI: 0.45-0.63), opioid (AOR=0.57, 95%CI: 0.35-0.91), Other psychoactive substance (AOR=0.54, 95%CI: 0.43-0.67), and tobacco use (AOR=0.59, 95%CI: 0.56-0.63) were negatively associated with sustained viral suppression.
- Other significant covariates related to sustained viral suppression were also identified. Participants with cardiovascular disease (AOR=1.67, 95%CI: 1.28-2.16), dementia (AOR=1.62, 95%CI: 1.18-2.24), chronic pulmonary disease (AOR=2.31, 95%CI: 2.13-2.50), or diabetes (AOR=1.90, 95%CI: 1.70-2.13), etc. tend to have higher probability to maintain viral suppression.

Figure 1. Coefficient estimates of the factors associated with Sustained Viral Suppression

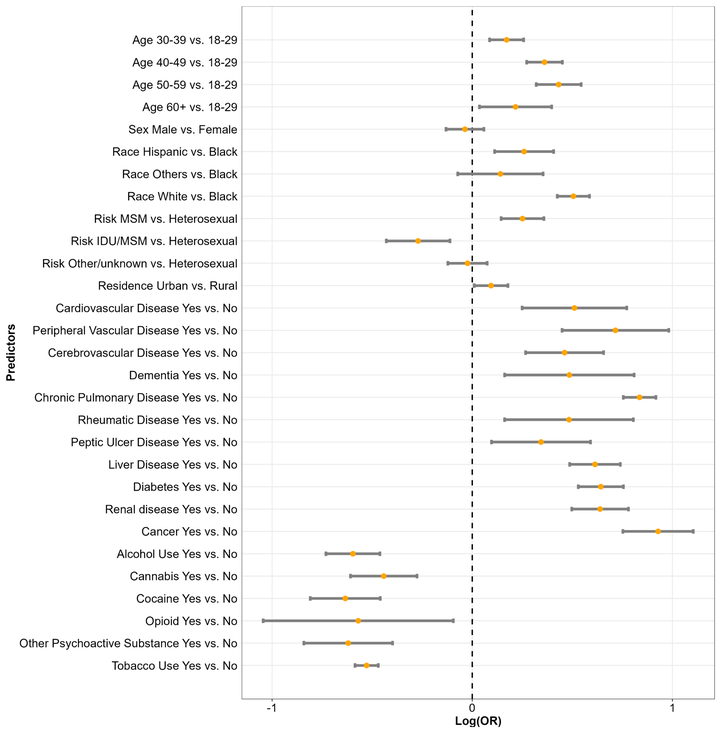


Table 1. Baseline characteristics among overall population and patients grouped by Sustained Viral Suppression Status

Characteristic	Overall	Sustained VS		P-Value
		Never	Ever	
	9334	1857 (19.89%)	7477 (80.11%)	
Age Group				0.002
18-29	3,930 (42.10%)	809 (43.56%)	3,121 (41.74%)	
30-39	1,948 (20.87%)	363 (19.55%)	1,585 (21.20%)	
40-49	1,929 (20.67%)	354 (19.06%)	1,575 (21.06%)	
50-59	1,133 (12.14%)	227 (12.22%)	906 (12.12%)	
60+	394 (4.22%)	104 (5.60%)	290 (3.88%)	
Sex				0.600
Female	2,226 (23.85%)	434 (23.37%)	1,792 (23.97%)	
Male	7,108 (76.15%)	1,423 (76.63%)	5,685 (76.03%)	
Race/Ethnicity				<0.001
Black	6,492 (69.55%)	1,314 (70.76%)	5,178 (69.25%)	
Hispanic	538 (5.76%)	151 (8.13%)	387 (5.18%)	
Other/unknown	253 (2.71%)	59 (3.18%)	194 (2.59%)	
White	2,051 (21.97%)	333 (17.93%)	1,718 (22.98%)	
Risk				<0.001
Heterosexual	1,771 (18.97%)	352 (18.96%)	1,419 (18.98%)	
MSM	4,812 (51.55%)	825 (44.43%)	3,987 (53.32%)	
IDU/MSM	489 (5.24%)	119 (6.41%)	370 (4.95%)	
Other/unknown	2,262 (24.23%)	561 (30.21%)	1,701 (22.75%)	
Region				0.023
Rural	1,576 (16.88%)	347 (18.69%)	1,229 (16.44%)	
Urban	7,758 (83.12%)	1,510 (81.31%)	6,248 (83.56%)	
Chronic Disease				<0.001
No	6,120 (65.57%)	1,387 (74.69%)	4,733 (63.30%)	
Yes	3,214 (34.43%)	470 (25.31%)	2,744 (36.70%)	
Alcohol Use				<0.001
No	8,353 (89.49%)	1,612 (86.81%)	6,741 (90.16%)	
Yes	981 (10.51%)	245 (13.19%)	736 (9.84%)	
Illicit drug Use				<0.001
No	8,000 (85.71%)	1,532 (82.50%)	6,468 (86.51%)	
Yes	1,334 (14.29%)	325 (17.50%)	1,009 (13.49%)	
Tobacco Use				<0.001
No	5,204 (55.75%)	1,112 (59.88%)	4,092 (54.73%)	
Yes	4,130 (44.25%)	745 (40.12%)	3,385 (45.27%)	

CONCLUSIONS

- Using a large cohort of PWH with a long follow up time, this study provided a comprehensive evaluation of the association between substance use disorder and sustained viral suppression.
- Our findings emphasize the negative impact of using alcohol, illicit drugs, and tobacco on maintaining sustained viral suppression. Developing long-term problem substance reduction strategies could help HIV patients achieve long-term viral suppression.

ACKNOWLEDGEMENT

- The research reported in this project was supported by the National Institute of Allergy and Infectious Diseases of the National Institutes of Health under Award Number R01AI164947.

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