

Recent Tobacco Smoking Associated with Indicators of HIV Progression

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Ryan White Part A

- Care and support services for people living with HIV/AIDS (PLWHA) who have no other payer for services
- Eligibility
 - $\leq 435\%$ of the federal poverty level
 - Residence in the New York Eligible Metropolitan Area (EMA) – New York City, Westchester, Rockland, or Putnam Counties
 - HIV Diagnosed
- Client population
 - Most earn less than 150% of the federal poverty level
 - High prevalence of substance use
 - High prevalence of comorbid conditions (e.g., Hep C, Depression)

Tobacco smoking among PLWHA

- PLWHA are two to three times more likely to smoke than the general population
(Gonzalez, Barinas & O'Cleirigh, 2011; Gritz et al, 2004; Kwong & Bouchard-Miller, 2010; Mdodo, 2015; Reynolds, 2009; USDHHS, 2014;)
- Approximately 50 to 60% of PLWHA in NYC smoke
(Messerli & Vardy, 2013; Tesoriero et al, 2008)
- Smoking associated with increased mortality and a higher-risk of negative health outcomes
(Helleberg et al., 2012;2014;2015; Marshall, 2009; Nakagawa et al., 2012; Petrosillo & Cicalini, 2013)

Tobacco smoking and HIV health outcomes

□ Viral Suppression

- Smoking associated with unsuppressed viral load

(Feldman et al., 2006; Miguez-Burbano et al., 2003; Wojna et al., 2007)

- Smoking not associated with unsuppressed viral load

(Kabali et al., 2011)

□ CD4 Cell Count

- Smoking associated with both increases and decreases in CD4 cell counts

(Feldman et al., 2006; Royce & Winkelstein, 1990; Wojna et al., 2007)

- Smoking not associated with changes in CD4 cell counts

(Burns et al., 1991; Conley et al., 1996; Craib et al., 1992; Gritz et al., 2004; Park et al., 1992; Webber et al., 1999).

Limitations of prior research

- Did not control for important covariates

- ART status

(Burns et al., 1991; Conley et al., 1996; Craib et al., 1992; Park et al., 1992)

- Substance use

(Burns et al., 1991; Conley et al., 1996; Miguez-Burbano et al., 2003; Park et al., 1992; Wojna et al., 2007)

- Small sample sizes

(Burns et al., 1991; Miguez-Burbano et al., 2003; Webb et al., 2007; Wojna et al., 2007)

Aims

- To examine differences in sociodemographic and clinical characteristics between HIV-positive individuals with and without recent tobacco smoking
- To examine the association between recent tobacco smoking and HIV health outcomes (unsuppressed viral load and low CD4 cell counts)

Data sources

- Electronic System for HIV/AIDS Reporting & Evaluation (eSHARE)
 - Demographic and clinical information (e.g., ART prescription status, age, gender, race-ethnicity, recent drug use)
 - Contractually required of organizations who provide HIV/AIDS services through a Ryan White Part A contract
- New York City HIV Surveillance Registry
 - Viral load and CD4 test dates and results
 - Legally mandated reporting by medical providers in NYC

Study population

Enrolled

- N=24,114
- HIV+ Ryan White clients enrolled in eSHARE between 11-1-2010 and 9-20-2013

Assessed

- N=19,042
- Clients age 18 or over who completed a valid substance use assessment

Matched

- N=17,554
- Clients who matched to the New York City Surveillance Registry and had at least one documented viral load and/or CD cell count

Final Sample

- N=14,713
- Clients who had a viral load and/or CD4 cell count test result within the three months prior to their most recent valid substance use assessment

Measures

- Recent tobacco smoking
 - Self-reported tobacco smoking in the 3 months prior to the substance use assessment
- Covariates
 - Age, ART prescription status, country of birth, education, gender, housing status, income, primary language, race/ethnicity, recent drug use, years since HIV diagnosis
- HIV health outcomes
 - Unsuppressed viral load (VL): $VL > 200$ copies/mL
 - Low CD4 cell count: $CD4 < 200$ cells/mm³
 - (both outcomes ≤ 3 months prior to substance use assessment)

Data analysis

- Chi-square tests
 - Used to examine differences between HIV-infected individuals with and without recent smoking
- Multivariate logistic regression
 - Two models used to identify covariates that remained independently associated with each HIV medical outcome

Comparisons between recent and non-recent tobacco smokers (n=14,713)

Characteristic ^a	Recent tobacco smoking N=5942 (40%)	No recent tobacco smoking N=8771 (60%)	P value
Male	3918 (40.8%)	5691 (59.2%)	.004
Female	1903 (39.2%)	2955 (60.8%)	
Transgender	117 (50.8%)	121 (49.2%)	
White	504 (40.6%)	739 (59.5%)	<.001
Black/African American	3322 (42.6%)	4473 (57.4%)	
Hispanic	1930 (37.9%)	3169 (62.2%)	
Other race/ethnicity	163 (31.4%)	357 (68.7%)	
<30 years old	612 (35.5%)	1114 (64.5%)	<.001
30-49 years old	2764 (41.6%)	3876 (58.4%)	
50+ years old	2566 (40.4%)	3781 (59.6%)	
< High school diploma	2646 (44.8%)	3260 (55.2%)	<.001
≥ High school diploma	3191 (38.6%)	5074 (61.4%)	

^aMissing responses within covariates were not included in the analysis

Comparisons between recent and non-recent tobacco smokers (n=14,713)

Characteristic ^a	Recent tobacco smoking N=5942 (40%)	No recent tobacco smoking N=8771 (60%)	P value
Other language	763 (24.8%)	2310 (75.2%)	<.001
English speaking	5177 (44.5%)	6456 (55.5%)	
Born in USA/US territory	5426 (47.1%)	6100 (52.9%)	<.001
Born outside of USA/US territory	487 (16%)	2567 (84.1%)	
Income <100% FPL	4641 (44%)	5900 (56%)	<.001
Income ≥100% FPL	786 (31.2%)	1730 (68.8%)	
Stable housing	3510 (34.9%)	6541 (65.1%)	<.001
Temporary housing	927 (48.7%)	978 (51.3%)	
Unstable housing	1407 (57.9%)	1025 (42.2%)	
Prescribed ART	4890 (40.2%)	7284 (59.8%)	<.001
Not prescribed ART	1040 (45.1%)	1264 (54.9%)	

^a Missing responses within covariates were not included in the analysis

Comparisons between recent and non-recent tobacco smokers (n=14,713)

Characteristic ^a	Recent tobacco smoking N=5942 (40%)	No recent tobacco smoking N=8771 (60%)	P value
No recent drug use ^b	4097 (33.5%)	8140 (66.5%)	<.001
Recent drug use ^b	1632 (77.3%)	480 (22.7%)	
No recent alcohol use ^b	3046 (30.8%)	6847 (69.2%)	<.001
Recent alcohol use ^b	2788 (60.1%)	1852 (39.9%)	
CD4 cell counts \geq 200	4321 (38.8%)	6807 (61.2%)	<.001
CD4 cell counts < 200	1321 (46.7%)	1506 (53.3%)	
Viral load \leq 200 (suppressed)	3070 (34.8%)	5762 (65.2%)	<.001
Viral load > 200 (unsuppressed)	2658 (49.7%)	2688 (50.3%)	
Years since HIV diagnosis (M +/- SD)	12.6 (7.2)	11.4 (7.2)	<.001

^a Missing responses within covariates were not included in the analysis

^b Recent alcohol and drug use is defined as having used one or more times in the three months prior to the substance use assessment

Multivariate results

- In multivariate models, there was a significant, independent relationship between recent tobacco smoking and:
 - unsuppressed viral load (AOR=1.38, CI=1.26-1.5)
 - low CD4 cell counts (AOR=1.12, CI=1.01-1.24)
- Sensitivity analysis results – no recent alcohol:
 - Independent relationship with unsuppressed viral load (AOR= 1.35, CI= 1.21-1.50)
 - Non-significant relationship with low CD4 cell counts (AOR= 1.11, CI= 0.98-1.25)

Limitations

- Social desirability bias
- Causal relationship could not be established
- High prevalence of low CD4 cell counts and unsuppressed viral load could lead to slightly inflated odds ratios
- Variables not included in analysis
 - Alcohol use, ART adherence, smoking frequency, past smoking status

Strengths

- The NYC HIV/AIDS Surveillance Registry
- Large sample size (n=14,713)
- Controlled for ART prescription status and substance use

Implications for practice and research

- Underscores the importance of addressing smoking in patients with HIV
- Smoking may not be an optimal harm reduction strategy for clients receiving substance use and/or mental health services
- More research required to determine potential mechanisms to explain the relationship between recent tobacco smoking and HIV health outcomes

Implications for Ryan White Part A in NYC

- Designating “tobacco smoking reduction counseling” as a reimbursable service type
- Improving data collection to better track prevalence, frequency, and type of tobacco use
- Requiring at least two annual smoking and tobacco use counseling sessions for mental health and harm reduction clients who report tobacco smoking
- Offering smoking and tobacco use trainings to service providers

Acknowledgements

- ▣ Ryan White providers for reporting client assessment and services data
- ▣ This work was supported through a grant from the Health Resources and Services Administration (H89HA0015) to the New York City Department of Health and Mental Hygiene.

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