Factors associated with smoking cessation among patients in the HIV Outpatient Study, 2007-2022

786

NATIONAL CENTER FOR HIV, VIRAL HEPATITIS, STD, AND TB PREVENTION

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BACKGROUND:

- The U.S. Preventive Service Task Force (USPSTF) recommends smoking screening and cessation strategies as a part of routine care.
- People with HIV (PWH) are more likely to smoke, and less likely to quit than the general population.
- This study aimed to assess factors associated with smoking cessation, including incident comorbidity diagnoses, among smokers seen in care at clinics of the HIV Outpatient Study (HOPS).

METHODS:

- We analyzed medical records and risk behavior survey data from HOPS participants enrolled from January 1, 2007 to December 31, 2022.
- We included participants who completed ≥ 1 behavioral survey, had evidence of current cigarette use at enrollment (baseline) or incident cigarette use, and who were not receiving smoking cessation medications at baseline.
- We identified smoking-related comorbidities based on laboratory results, clinical diagnoses, and treatments.
- Smoking cessation medications included varenicline (Chantix), bupropion (Zyban), and nicotine replacement products.
- Quitting smoking was ascertained by behavioral survey and chart entries.
- Associations of first attempt to quit smoking with incident comorbidities, prescription of smoking cessation medications, sociodemographic and other clinical factors were assessed using the counting process within Cox proportional hazards analyses.

RESULTS:

- Among 464 eligible participants, 76% were men, 34% White persons, 47% Black persons, 17% Hispanic/Latino persons, 46% aged 40 and older. (Table 1)
- At baseline, 88 (19%) had smoking-related comorbidities of either chronic obstructive pulmonary disease (COPD)/emphysema (n=26), cardiovascular disease (CVD) (n=59), or cancers (n=14).

About 1/3 of smokers attempted to quit smoking during observation in the HOPS, indicating opportunities to intensify primary and/or secondary prevention of smoking-related chronic diseases in persons with HIV.

Table 1: Participant characteristics by smoking quit attempt status during observation, HOPS 2007-2022 (N=464).

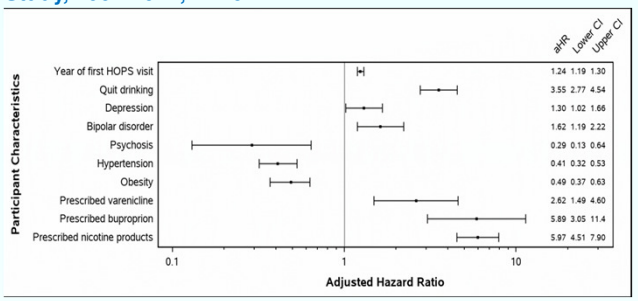
Baseline Characteristic*	Overall N (%)	Never quit smoking during observation N (%)	Quit smoking during observation N (%)	P-value†
Overall	464 (100.0)	301 (64.9)	163 (35.1)	
Race/ethnicity				
White, non-Hispanic/Latino	157 (33.8)	94 (31.2)	63 (38.7)	
Black, non-Hispanic/Latino	216 (46.6)	148 (49.2)	68 (41.7)	0.34
Hispanic/Latino	80 (17.2)	51 (16.9)	29 (17.8)	
Other/unknown	11 (2.4)	8 (2.7)	3 (1.8)	
Year of first HOPS visit				
2007-2011	303 (65.3)	196 (65.1)	107 (65.6)	0.21
2012-2016	125 (26.9)	86 (28.6)	39 (23.9)	
2017-2022	36 (7.8)	19 (6.3)	17 (10.4)	
HIV transmission risk activity				
Male to male sexual activity	251 (54.1)	151 (50.2)	100 (61.3)	
Heterosexual activity	168 (36.2)	118 (39.2)	50 (30.7)	0.06
Injection drug use	28 (6.0)	22 (7.3)	6 (3.7)	
Other/unknown activity	17 (3.7)	10 (3.3)	7 (4.3)	
Insurance Payer				
Private	167 (36.0)	94 (31.2)	73 (44.8)	0.008
Public	243 (52.4)	166 (55.2)	77 (47.2)	
No insurance	54 (11.6)	41 (13.6)	13 (8.0)	
HOPS site type				
Private	196 (42.2)	117 (38.9)	79 (48.5)	0.06
Public	268 (57.8)	184 (61.1)	84 (51.5)	
Employment (full or part-time)				
Yes	191 (41.2)	108 (35.9)	83 (50.9)	0.002
No	273 (58.8)	193 (64.1)	80 (49.1)	
CD4+ cell count, cells/mm^3				
< 200	130 (28.0)	88 (29.2)	42 (25.8)	
200-349	83 (17.9)	52 (17.3)	31 (19.0)	0.49
350-499	89 (19.2)	52 (17.3)	37 (22.7)	
≥ 500	161 (34.7)	108 (35.9)	53 (32.5)	
Viral load, copies/mL				
< 200	165 (35.6)	110 (36.5)	55 (33.7)	0.70
≥ 200	298 (64.2)	190 (63.1)	108 (66.3)	
Prescribed smoking cessation treatment (during observation)				
Varenicline**	54 (11.6)	35 (11.6)	19 (11.7)	1.00
Bupropion**	30 (6.5)	20 (6.6)	10 (6.1)	0.99
Nicotine replacement products**	120 (25.9)	80 (26.6)	40 (24.5)	0.71
Any (Varenicline, Bupropion, or Nicotine replacement products)**	159 (34.3)	103 (34.2)	56 (34.4)	1.00
Quit drinking‡	69 (14.9)	37 (12.3)	32 (19.6)	0.047
Diabetes‡	71 (15.3)	56 (18.6)	15 (9.2)	0.011
Depression‡	151 (32.5)	88 (29.2)	63 (38.7)	0.05
Anxiety‡	176 (37.9)	113 (37.5)	63 (38.7)	0.89
Bipolar disorder‡	67 (14.4)	39 (13.0)	28 (17.2)	0.27
Psychosis‡	23 (5.0)	16 (5.3)	7 (4.3)	0.80
Cancer‡	31 (6.7)	23 (7.6)	8 (4.9)	0.35
COPD, Emphysema‡	57 (12.3)	47 (15.6)	10 (6.1)	0.005
CVD‡	141 (30.4)	100 (33.2)	41 (25.2)	0.09
Hypertension‡	258 (55.6)	192 (63.8)	66 (40.5)	< 0.001
Obesity‡	183 (39.4)	134 (44.5)	49 (30.1)	0.003

* Date of 1st HOPS encounter during 2007-2022 observation window.
† Yates-corrected chi-square test.
** Counting process variables
‡ Prevalent and incident conditions, diagnoses after first quit smoking date censored. Cancer types included are lung, larynx, oral cavity and pharynx, esophagus, pancreas, bladder, stomach, colon and rectum, liver, cervix, kidney, and acute myeloid leukemia.
One participant did not have a CD4+ cell count or viral load recorded.
Obesity was defined as body mass index ≥ 30 kg/m^2.
Abbreviations: COPD, chronic obstructive pulmonary disease; CVD, cardiovascular disease.

RESULTS (continued):

- Of the 88 smokers with comorbidity at baseline, 30 were prescribed any smoking cessation medications and 27 attempted to quit smoking during observation.
- During a median follow-up time of 2.3 years (interquartile range: 0.8-5.2 years), 159 (34%) were prescribed smoking cessation medications (varenicline 54, bupropion 30, nicotine products 120), and 163 (35%) attempted to quit.
- In univariate Cox regression analysis, the following factors were associated (directly or inversely) with first attempt to quit smoking:
  - Later year of 1st HOPS visit, age, sex, race/ethnicity, HIV risk activity, insurance payor, HOPS clinic type, employment, CD4 cell count, quitting drinking alcohol, diagnoses of diabetes, depression, psychosis, COPD, hypertension, obesity, and being prescribed varenicline, bupropion, or nicotine replacement products.

Figure 1: Adjusted associations of first attempt to quit smoking with participant characteristics, the HIV Outpatient Study, 2007-2022, N=464.



Abbreviations: aHR, adjusted hazard ratio; CI, confidence interval.
Comorbidities were determined at baseline and during observation.
Referent groups were the following: not quitting drinking, no diagnoses of depression, bipolar disorder, psychosis, hypertension, obesity, or not prescribed varenicline, bupropion or nicotine replacement products. Final multivariable model incorporated backward selection and included factors with P ≤ 0.10 in full multivariable models.

RESULTS (continued):

- The following factors were positively associated with first attempt to quit smoking: (Figure 1)
  - Year of first HOPS visit, quitting drinking, having a diagnosis of depression or bipolar disorder, and being prescribed varenicline, bupropion, or nicotine replacement products.
  - Having a diagnosis of psychosis, hypertension or obesity were inversely associated.

LIMITATIONS:

Data on behavioral interventions (e.g., behavioral support and counseling), as well as e-cigarette use were not available for analysis.

CONCLUSIONS:

About 1/3 of HOPS smokers attempted to quit smoking during the observation, indicating an opportunity to further strengthen primary and/or secondary prevention of smoking-related chronic diseases in persons with HIV. The majority of smokers with baseline/incident comorbidities did not attempt to quit smoking during the observation.

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