Associations between drug use patterns and viral load suppression among HIV-positive individuals who use support services in New York City

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INTRODUCTION

- High rates of substance use persist among people living with HIV (PLWH)

- Studies have consistently found that crystal meth,[1-4] cocaine,[5,6] prescription opioids,[7] and heroin[6] are associated with unsuppressed viral load (VL)

- Fewer studies have examined associations between drug use patterns over time and HIV medical outcomes, although those that have indicate that even intermittent use is associated with a higher risk of opportunistic infections[8] and unsuppressed VL[9]
  - These studies were conducted prior to the release of universal antiretroviral therapy (ART) guidelines in the US, and prior to the widespread availability of single-tablet, once-daily ART regimens

- Understanding the relationship between drug use patterns and VL suppression is important because:
  - drug use patterns may change over time
  - the risk of virologic failure may vary by different drug use patterns
  - findings could be used to tailor outreach and engagement efforts to PLWH with different types of drug use patterns

AIMS

1. To describe drug use patterns among HIV-infected individuals receiving Ryan White Part A (RWPA) support services in New York City (NYC)

2. To examine sociodemographic and clinical characteristics associated with particular patterns of drug use

3. To identify any independent associations between drug use patterns and unsuppressed VL

METHODS

Data Sources (and Variables Derived from Each)
- **The Electronic System for HIV/AIDS Reporting and Evaluation (eSHARE):** Client-level demographic, psychosocial, clinical, and service utilization data collected from PLWH receiving RWPA services in NYC

- **The NYC HIV Surveillance Registry (the "Registry"):** VL lab values and HIV diagnosis dates

Client Population
7,896 PLWH who matched to the Registry and completed at least 3 substance use assessments in eSHARE that met the following criteria:
1. the first assessment was an Intake Assessment; and
2. the assessments were at least 90 days apart; and
3. the first assessment was dated no earlier than 1/2012 and the third assessment was dated no later than 9/2015; and
4. the first and third assessments were no more than 24 months apart

Measures
Drug Use Patterns (Exposure):
- Drug use was defined as reporting crack/cocaine, heroin, crystal meth, and/or recreational prescription drug use in the past 3 months

- Clients were categorized into one of 4 patterns of drug use based on their responses on 3 substance use assessments meeting the above criteria:
  - **Persistent use** (drug use reported on each assessment)
  - **Intermittent use-active** (drug use reported on third assessment but not all previous ones)
  - **Intermittent use-inactive** (drug use reported previously with no drug use reported on the third assessment)
  - **Persistent non-use** (no drug use reported on any assessment)

Unsuppressed Viral Load (Outcome): HIV-1 RNA >200 copies/mL (based on the last VL value in the 12-month period following an individual's third qualifying substance use assessment)

Sociodemographic and Clinical Characteristics (Covariates): Gender, age, race/ethnicity, primary language, education, income, country of birth, housing status, ART prescription status at intake, VL suppression status at intake, and year diagnosed with HIV

Data Analysis
- Chi-square and Fisher's exact tests were used to examine relationships between sociodemographic/clinical characteristics and drug use patterns

- Unadjusted odds ratios for unsuppressed VL by drug use pattern were calculated using bivariate logistic regression models

- Covariates that were statistically significant (p<.05) in bivariate analyses were included in multivariate models to calculate adjusted odds ratios

RESULTS

- Client population was predominantly:
  - male (61%)
  - black (57%)
  - diagnosed with HIV in 1997 or later (71%)
  - living below the federal poverty level (83%)

Figure 1. Self-reported lifetime and recent drug use
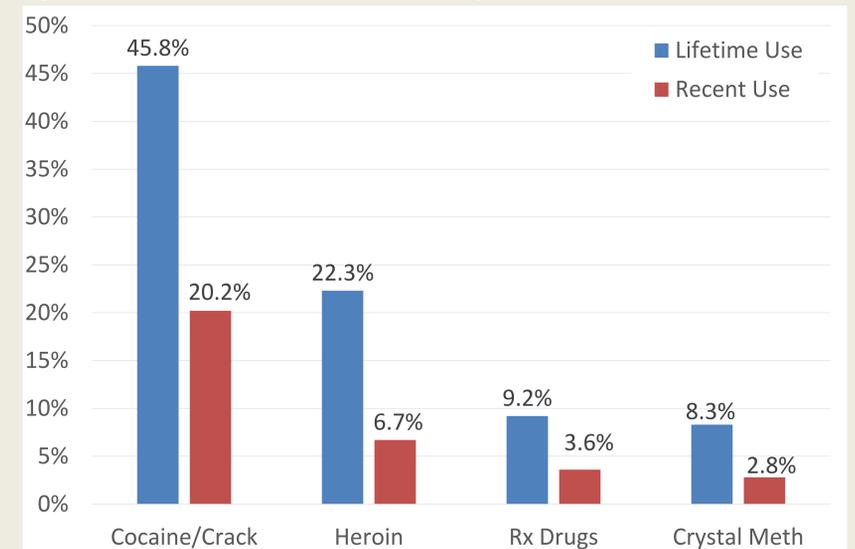
- Compared to persistent non-users, drug users were more likely to be:
  - transgender
  - between 30 and 49 years old
  - educated at less than the high school level
  - born in the US/US territory
  - primarily English speaking
  - living below the federal poverty level
  - unstably housed
  - receiving RWPA harm reduction services

Table 1. Associations between drug use patterns and unsuppressed VL

Drug Use Pattern	Total n (%)	Unsuppressed VL n (%)	OR (95% CI)	aOR* (95% CI)
Persistent non-use	5,920 (75.0%)	1,450 (24.5%)	ref.	ref.
Intermittent use, inactive at 3rd assessment	919 (11.6%)	337 (36.7%)	1.79 (1.54-2.07)	1.25 (1.04-1.49)
Intermittent use, active use at 3rd assessment	684 (8.7%)	292 (42.7%)	2.30 (1.95-2.70)	1.66 (1.36-2.02)
Persistent use	373 (4.7%)	184 (49.3%)	3.00 (2.43-3.71)	2.19 (1.71-2.82)

*Model adjusted for baseline ART status, baseline VL suppression, year of diagnosis, gender, race/ethnicity, age group, education, primary language, country of birth, income, and housing status

DISCUSSION

- The outcome (unsuppressed VL) varied as expected with recent drug use patterns (i.e., persistent use was the most strongly associated with unsuppressed VL)

- Both categories of intermittent use were associated with unsuppressed VL, underscoring that even PLWH who occasionally use drugs may have an elevated risk for negative HIV care outcomes

- Future studies should examine how substance use treatment, harm reduction, and case management services can address the needs of PLWH with different types of drug use patterns

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