

Initiation of injection drug use by gay, bisexual and other men who have sex with men in Canada's three largest cities (2017-2023)

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BACKGROUND

- Injection drug use (IDU) is associated with higher risk exposure to HIV and hepatitis C (HCV)
- Amphetamines (including crystal methamphetamine), cocaine, and opioids (ACO) are commonly used substances among gay, bisexual, and other men who have sex with men (GBM)
- There is limited research exploring injection drug use (IDU) initiation among GBM cohorts
- Understanding the context of IDU initiation could prevent further HIV and HCV burden among GBM

Objective: We examined IDU initiation of ACO in a cohort of GBM

METHODS

Study design & participants

Engage study: a closed cohort study (2017-2023)

Participants: sexually-active GBM, aged ≥16 years in Montreal, Toronto and Vancouver

Recruitment: respondent-driven-sampling (RDS) at baseline with follow-up every 6-12 months

Data collection: computer-assisted self-interview (CASI) questionnaire and testing for sexually transmitted and blood borne infections at each visit

Variables

Outcome: Incidence of first IDU of ACO (past six-month; P6M)

- estimated among participants with no lifetime history of injection
- those reporting first IDU of other substances excluded

Explanatory factors: Time-lagged (i.e., at most recent prior visit) sociodemographic, P6M sexual and substance use behaviours, psychosocial, and health-related factors

Statistical analysis

Predictive multivariable models explored potential factors of IDU initiation. Rate ratios (RR) were estimated using three-city/pooled data and Poisson regression accounting for time of exposure, study city. **Model selection:** most parsimonious using lowest Akaike information criterion (AIC) **Adjustments:** RDS-II and inverse-probability-of-censoring weights.

RESULTS

- Of 2449 participants, the adjusted prevalence of IDU of ACO P6M at cohort entry was 5.1% (95% confidence interval (CI): 4.2-6.2).
- Among 2210 GBM with no IDU history (6861 years follow-up), **first IDU of ACO P6M** was reported by:
 - 33 participants, representing an incidence of 0.5 per 100 person-years (95%CI: 0.3-0.7)

TABLE. Baseline characteristics of participants who did not initiate vs. those who initiated IDU of amphetamines, cocaine or opioids (ACO) between 2017-2023

	Participants who did not initiate IDU of ACO (n=2166)	Participants who initiated IDU of ACO (n=33)	SMD ¹
Sociodemographic characteristics	%	%	
Age < 30 yrs	39.4	30.3	0.19
Person of colour (POC) ²	26.2	24.2	0.04
Education: no post-secondary studies	30.8	45.5	0.32
Employed	74.0	69.7	0.10
Income < 30KCAD	49.7	63.6	0.28
Gay	83.1	90.9	0.21
Unstable housing	6.7	6.1	0.03
Sexual behaviours (past 6 months)			
Having a main sex partner	45.5	39.4	0.12
6+ male sex partners	53.2	66.7	0.27
Attendance to group sex events	26.1	45.5	0.44
Attendance to party and play (pnp) party	4.5	34.4	1.39
Transactional sex ³	8.0	18.2	0.37
Non-injection substance use (past 6 months)			
Crystal methamphetamine use	6.7	45.2	1.51
Other amphetamine use	28.5	56.2	0.61
Cocaine or crack use	23.2	31.2	0.19
Opioid use	5.7	15.6	0.43
Heroin use	0.6	3.1	0.33
Hallucinogen use	17.9	34.4	0.43
Use of more than one substance ⁴	34.2	69.7	0.75
High risk substance use (as per ASSIST)⁵			
High risk amphetamine use	8.4	6.2	0.08
High risk cocaine/crack use	6.5	6.2	0.01
High risk opioids use	3.0	6.2	0.19
Psychosocial characteristics			
Moderate to severe depressive symptoms ⁶	6.4	3.4	0.12
Moderate to severe anxiety symptoms ⁶	25.8	30	0.09
Childhood sexual abuse (lifetime) ⁷	20.9	33.3	0.31
Poor mental health (past 6 months)	26.5	18.2	0.19
Health and access to care			
Living with HIV (self-reported)	13.1	39.4	0.77
Having a regular health care provider	69.9	78.8	0.19
Received services to reduce drug use (lifetime)	7.1	15.2	0.31

¹Standardized mean differences calculated as the absolute value of the difference in proportions between the two groups in units of the pooled standard deviation. SDs ≤ 0.1 were considered negligible differences; ²Derived from two questions on ethnicity and identifying as person of colour; ³Based on the question "have you ever given or received money, drugs, or other goods or services in exchange for sex?"; ⁴use of more than one of the following: barbiturate, benzo, cocaine, codeine, crack, crystal, ecstasy, GHB, heroin, ketamine, LSD, mephedrone, morphine, mushrooms, nitrous oxide, oxycontin, other hallucinogens, other opioids, poppers, ritalin, speed, and steroids; ⁵Alcohol, Smoking and Substance Involvement Screening Test (WHO, 2010); 6-item scale; score range:0-39; classified into 3 categories; high risk (>26) of developing dependence or problems (health, social, financial, etc.) related to substance use; ⁶Hospital Anxiety and Depression Scale (Zigmond, AS and Snaitchs RP, 1983); 14-item scale (7=anxiety, 7=depression), score range: 0-21, classified into three categories; moderate to severe (>10); ⁷Based on the Childhood Trauma Questionnaire Short Form (Bernstein et al. 2003)

Non-injection crystal methamphetamine use was the predictor of ACO IDU initiation consistently identified in the multivariable models with the best AIC scores.

Additional factors of ACO IDU initiation contributing to model fit:

- ≥6 (vs ≤ 5) male sexual partners
- attendance at party-and-play (pnp) events
- non-injection opioid use
- living with HIV (self-reported)
- use of more than one substance
- being a person of colour

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CONCLUSIONS

- Non-injection use of crystal methamphetamine appears important for identifying GBM at risk of IDU initiation of ACO
- Appropriate harm reduction programming for non-injection drug use and those transitioning to IDU, may be key for HIV and HCV elimination
- Despite adjustments for selection bias and attrition, some GBM may be over- or under-represented. Though we employed strategies to mitigate information bias (CASI), our questionnaire addressed sensitive topics possibly leading to social desirability bias. Study results may not be generalizable to GBM living outside large urban areas
- Using a data driven predictive modeling approach limits the interpretation of the 95% CI of RR for identified predictors. Nonetheless, we identified several substance use-related and sexual behaviours for further examination

Next steps: analyses will focus on understanding the nature of non-injection crystal meth use (e.g., duration, severity) and the causal relationships leading to IDU initiation

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