Characteristics of Persons Diagnosed With HIV in a Population-Based PrEP Program in British Columbia, Canada

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1231

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The HIV diagnosis rate was low in British Columbia's large real-world, oral HIV PrEP Program. New HIV diagnoses occurred almost exclusively amongst participants who disengaged from PrEP medication with ongoing risk factors.

BACKGROUND

- Since 2018, publicly-funded, tenofovir-based HIV Pre-Exposure Prophylaxis (PrEP) has been available to persons at elevated HIV risk in British Columbia (BC) through the centralized BC Centre for Excellence in HIV/AIDS Drug Treatment Program.
- We described new HIV diagnoses, evaluated factors associated with new HIV diagnoses, and determined the HIV diagnosis rate over 6 years of BC's HIV PrEP Program.

METHODS

- This retrospective observational cohort study includes BC PrEP participants with ≥1 PrEP prescription dispensed between 1-Jan-2018 to 31-Dec-2023 (follow-up to 30-Jun-2024).
- Baseline demographic, clinical and PrEP prescription characteristics were reported by total, and by HIV status at the end of follow-up. Participants with and without subsequent HIV diagnosis were compared using Chi-square or Fisher's exact tests and Wilcoxon rank sum tests.
- Demographic and clinical variables with statistical and clinical significance were selected for the multivariate analysis to model the probability of HIV diagnosis.
- The HIV diagnosis rate was calculated for the overall BC PrEP cohort.

RESULTS

Baseline characteristics of all participants

- Overall, 12,389 BC PrEP program participants were included and followed for a median of 31 (Q1-Q3, 15-58) months.
- Most participants reported no prior PrEP experience at the time of program enrolment (n=10,440, 84.3%)
- The majority of cohort identified as gay, bisexual and other men who have sex with men (MSM) (n=12,152, 98.1%).

HIV PrEP participants diagnosed with HIV

- Overall, 73 (0.6%) PrEP participants (all MSM) were subsequently diagnosed with HIV during the study period, at median 32 (Q1-Q3, 13-50) months after PrEP program enrolment.
- Based on dispensing records, only 5 (6.9%) newly diagnosed participants had PrEP medication supply at the time of HIV diagnosis, and 27 (37.0%) were diagnosed 18 months after their prescription run-out date.
- Comparisons of characteristics between participants who were and were not diagnosed with HIV are found in Table 1.

Results, continued

Table 1: Comparing BC PrEP participant demographics and prescription characteristics by HIV status at end of follow-up

	All participants N=12,389	Participants without HIV n= 12,316	Participants diagnosed with HIV n= 73	p-value
Age in years*, median	32 (27-41)	32 (27-41)	31 (25-37)	**0.044**
Gender identity, n (%)				0.999
Cisgender men	11,869 (95.8)	11,798 (95.8)	71 (97.3)	
Cisgender women	117 (0.9)	117 (0.9)	0 (0)	
Other gender	380 (3.1)	378 (3.1)	2 (2.7)	
Unknown	23 (0.2)	*23 (0.2)*	*0 (0)*	
HIV acquisition risk, n (%)				0.999
MSM	12,152 (98.1)	12,079 (99.1)	73 (100)	
Non-MSM	116 (0.9)	116 (1.0)	0 (0)	
N/A or unknown	121 (1.0)	*121 (1.0)*	*0 (0)*	
HIRI-MSM score, n (%)**				**<0.001**
10-24	9223 (74.4)	9182 (80.8)	41 (59.4)	
≥ 25	2211 (17.9)	2183 (19.2)	28 (40.6)	
N/A or unknown	955 (7.7)	*951 (7.7)*	*4 (5.5)*	
Known substance use† , n (%)	309 (2.5)	297 (2.4)	12 (16.4)	**<0.001**
Syphilis infection during follow-up, n (%)	1168 (9.4)	1145 (9.3)	23 (31.5)	**<0.001**
PrEP prescriptions dispensed, median	6 (3-12)	6 (3-12)	2 (1-5)	**<0.001**
Proportion of days covered by PrEP medication††, median %	60 (33-87)	60 (33-87)	22 (11-53)	**<0.001**
Months from PrEP run-out date to end of follow-up‡, median	2.5 (0-6.1)	2.4 (0-6.1)	13.2 (5.6-28.3)	**<0.001**
Months from last negative HIV test to HIV diagnosis or end of follow-up, median	2 (0.5-5.1)	2 (0.5-5)	10.3 (5.2-19.2)	**<0.001**

Abbreviations: HIRI-MSM, HIV incidence risk index score for MSM; N/A, not applicable.
Medians reported with interquartile ranges (Q1-Q3). p-values compare participants with and without subsequent HIV (*N/A and/or Unknown were excluded from calculation*).
*At first PrEP dispense. **Based on n=11,434 with HIRI-MSM score reported at program enrolment. †Based on reported substance use at program enrolment and/or positive urine drug screen in available follow-up records. †† total days of PrEP medication that could have been taken from first PrEP dispense date to end of client follow-up (based on daily dispensing) divided by total days in the timeframe x 100. ‡ Based on record of last prescription dispensed and once-daily use.

HIV diagnosis rate among BC PrEP Participants

Table 2: Calculating the HIV diagnosis rate amongst BC HIV PrEP Participants

Method	N	# of participants diagnosed with HIV	HIV diagnosis rate (per 100 PY)	95% CI	PY of follow up
A	**12,389**	**73**	**0.19**	**0.14, 0.23**	**39,305**
B	12,389	46	0.12	0.08, 0.15	39,261

A) Participants diagnosed with HIV: followed from date of first PrEP dispense to HIV diagnosis date. Participants without HIV: followed from date of first PrEP dispense to the earliest of: deceased date, end of study period, or 18 months after latest PrEP medication run-out date. This rate has been updated since the abstract.
B) All participants followed from date of first PrEP dispense to earliest of: deceased date, HIV diagnosis date, end of study period, or 18 months after latest PrEP run-out date based on daily use. 27 participants not included as their HIV diagnosis date was greater than 18 months after expected PrEP medication run-out date.

Multivariate results for new HIV diagnoses amongst PrEP participants

Table 3: Modelling the probability of new HIV diagnosis, N=12,389

	OR (95% CI)	aOR (95%CI)
Age (per 10 year decrement)	1.32 (1.05-1.68)	1.20 (0.94-1.52)
HIRI-MSM score		
10-24	1.00	1.00
≥ 25	2.87 (1.77-4.66)	**2.04 (1.22-3.42)**
N/A or Unknown	0.94 (0.34-2.64)	0.68 (0.24-1.97)
Syphilis infection during follow-up		
No	1.00	1.00
Yes	4.59 (2.76-7.63)	**4.55 (2.64-7.83)**
Unknown	1.23 (0.52-2.90)	0.71 (0.29-1.78)
Known substance use		
No	1.00	1.00
Yes	7.96 (4.24-14.94)	**3.73 (1.88-7.40)**
PrEP prescriptions dispensed		
≥ 3	1.00	1.00
< 3	4.43 (2.79-7.05)	**3.91 (2.22-6.88)**
Months from PrEP run-out date to end of follow-up (per 1-month increment)	1.05 (1.04-1.06)	**1.03 (1.02-1.04)**

Abbreviations: OR, odds ratio; aOR, adjusted odds ratio

HIV characteristics amongst PrEP participants diagnosed with HIV

- Of the 73 participants newly diagnosed with HIV, 14 (19%) had an acute infection (based on indeterminate serology with detectable HIV RNA).
- The median time from HIV diagnosis to antiretroviral therapy (ART) initiation was 7 (Q1-Q3, 4-17) days.
- Of the 68 participants with resistance testing performed prior to ART initiation, 6 had the M184V reverse transcriptase mutation detected.
- None of the participants had tenofovir resistance.

CONCLUSIONS

- The rate of new HIV diagnoses was low over 6 years of BC's PrEP program for individuals at elevated HIV risk.
- The majority (93.1%) of new HIV diagnoses were in participants without an active PrEP medication supply at the time of diagnosis.
- Strategies are therefore needed to support focused, long-term engagement in PrEP care particularly for those with ongoing risk.
- Centralized HIV treatment and prevention facilitated timely ART start among participants who were newly diagnosed with HIV.

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