Longitudinal differences in sub-optimal adherence among youth and adults living with HIV

Background

- Early initiation and optimal adherence to antiretroviral therapy is critical for achieving the final 90-90-90 target of viral suppression to improve health outcomes and reduce HIV transmission.¹
- Lifelong adherence to ART may be particularly challenging for youth living with HIV (YLWH), who are navigating difficult decisions around sexual relationships and diclosure.^{2,3}
- In order to better understand challenges of adherence among YLWH, we examined differences in ART adherence among YLWH and adults with HIV living in British Columbia receiving ART at no cost, as well as factors associated with sub-optimal (<80%) adherence from 2010 to 2016.

Methods

- We used administrative data from the British Columbia (BC) Centre for Excellence in HIV/ AIDS Drug Treatment Program (DTP), a population-level provincial database of all individuals living with HIV who have been linked to care in the universal healthcare setting of BC.
- Adherence was measured based on pharmacy refill compliance (calculated as the number of days ART medication dispensed, divided by the number of days of follow-up during each year). Individuals were considered to be sub-optimally adherent if they received ART for $\leq 80\%$ of the time in each year that follow-up was available.
- The proportion of participants with sub-optimal adherence (<80%) among youth (15-29 years) and among adults (30+) was compared from 2010-2016.
- Univariable and multivariable generalized estimating equation (GEE) models assessed the independent association between sub-optimal adherence and being a youth (vs. adult ≥30 years old).
- An explanatory GEE model was conducted to examine factors associated with suboptimal adherence from 2010-2016 among YLWH specifically.

Results

• A total of 7485 individuals were included in this analysis, 291 (3.9%) of which were youth in 2016.

• Of the YLWH, 39 (13.3%) had a history of injection drug use (IDU), and were on ART for a median of 2 years (Q1, Q3: 1-5) compared to 9 (Q1, Q3: 5-16) among adults (Table 1).



Table 1- Baseline characteristics of youth (aged 15-29 in 2016) and adults (aged >30 in 2016) living with HIV and initiated on ART in British Columbia between 2010 and 2016

Characteristic	Overall (n=7, 550)	Youth (15-29) (n=291)	Adults (≥30) (n=7,259)	P-value
Sex Male Female	6196 (82.1) 1254 (17.9)	241 (82.3) 52 (17.7)	5955 (82.1) 1302 (17.9)	0.999
Adherent in 2016 <80% ≥80%	1087 (17.1) 5252 (82.9)	179 (73.7) 64 (26.3)	1023 (16.8) 5073 (83.2)	<0.001
Indigenous ancestry	991 (13.1)	21 (7.2)	2487 (34.3)	0.062
History of Injection drug use	2526 (33.5)	39 (13.3)	2679 (36.9)	<0.001
HCV-Serostatus*	2758 (36.5)	34 (11.6)	2487 (34.3)	<0.001
Doctor experience: Median (Q1, Q3)**	75 (18-166)	119 (34-258)	74 (18-163)	<0.001
Initiated ARV treatment <15	26 (0.3)	24 (8.2)	2 (0.0)	<0.001
Years on ART (Median: Q1, Q3)	9 (5-15)	2 (1-5)	9 (5-16)	<0.001

Items in **bold** are significant at p<0.05

*Anti-body positive ** Doctor experience: the number of patients living with HIV treated in the past 2 years prior to seeing this

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Figure 1-Proportion of youth aged 15 to 19, 20 to 24 and 25 to 29, and adults aged ≥30 with sub-optimal adherence (<80%) from 2010 to 2016 in BC

Between 2010 and 2016 the proportion of individuals with sub-optimal adherence significantly reduced for youth (aged 15-29) (from 52.7% to 26.3%, p<0.001), however remained relatively stable among adults.

During the study period, within the youth groups there was a significant reduction in <80% adherence among both youth aged 20-24 as well as 25-29 (p<0.001). Reductions in suboptimal adherence were not significant among those aged 15-19.



Youth (>=80% adherent) Adult (>=80% adherent) Youth (<80% adherent)</p> Adult (<80% adherent)</p>

• For young people who are initiating and negotiating dating and new sexual relationships, adhering to ART and maintaining virologic suppression has enormous potential to normalize sexuality of sero-positive youth.

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Figure 2- Proportion of youth and adults virally suppressed among those with ≥80% adherence and <80% adherence by year

Despite significant differences in sub-optimal adherence outcomes between youth and adults, with more youth having less than 80% adherence compared to adults throughout the study period (**Figure 1**), similar levels of viral suppression by adherence group were found among youth and adults throughout the study period.

- As youth in our cohort aged, we saw significant reductions in suboptimal adherence.
- Despite significant differences in levels of adherence between youth and adults, we found that having ≥80% adherence was associated with high levels of viral suppression for both youth and adults in our sample.
- Key young populations, including those with a history of injection drug use continue to be disproportionately affected by the HIV epidemic,³ and were more likely to have suboptimal adherence.
- Scale-up in youth-focused and harm-reduction adherence supports, are needed to address persistent gaps in adherence among YLHIV accessing care within settings where ART is universally available.



Results Continued

• In a mutivariable, confounding GEE model, compared with adults, youth had significantly greater adjusted odds of sub-optimal adherence (aOR= 1.88, 95% CI=1.67-2.11) after controlling for history of injection drug use (IDU) and number of years on ART.

 Table 2- Unadjusted and adjusted factors associated with poor adherence among youth from 2010 to 2016

Characteristic	Unadjusted Odds Ratio (OR) (95%CI)	Adjusted Odds Ratio (aOR) (95%CI)
Age (time-dependent)	0.85 (0.81-0.90)	0.84 (0.79-0.88)
Sex Female Male	0.77 (0.53-1.12) Ref	Not Selected
History of injection drug use No Yes	Ref 1.59 (1.02-2.48)	Ref 2.05 (1.25-3.27)
Doctor Experience with HIV clients in the last 2 years prior to seeing patient	1.10 (1.02-1.18)	1.18 (1.08-1.29)

Items in **bold** are significant a p<0.05

• Among youth living with HIV, factors associated with suboptimal (<80%) adherence included history of injection drug use (aOR=1.69, 95%CI=1.07-2.66) and having a doctor with more experience working with HIV clients (aOR=1.11, 95% CI=1.03-1.20; per 100 patient increase). Odds of Suboptimal adherence decreased among YLHIV with age (aOR=0.84, 95% CI=0.79-0.88) (Table 2).

Discussion

Between 2010 and 2016, we observed YLWH were significantly more likely to be suboptimally adherent compared to adults living with HIV in the universal health care setting of British Columbia, Canada.

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