BRITISH COLUMBIA
CENTRE *for* EXCELLENCE
in HIV/AIDS

Providence HEALTH CARE
How you want to be treated.

Incidence Rates And Factors Associated With HIV-RNA Blips In Persons On ART In British Columbia

S Guillemi, J Toy, J Trigg, W Zhang, E Ding,
M Hull, C Brumme, J Montaner

BC- Centre for Excellence in HIV/AIDS- Vancouver, Canada

Contact : sguillemi@bccfe.ca

Background

- Persons living with HIV-1 (PLWH) who achieve viral suppression (VS) on ART may experience viral blips (VB) or low-level viremia (LLV).
- VB have been found in between 10% to 50% of PLWH in some studies and LLV has an estimated prevalence of between 5% to 30%.[1,2]
- Although several factors have been described to cause VB and LLV, including poor ART adherence, laboratory errors, release of virus from reservoirs, etc, their cause and clinical consequences are still not clear.[2-4]
- We evaluated a cohort of individuals who achieved VS and subsequently developed VB or LLV and factors associated to VB.

1. *JID 2011; 204:515–520. Taiwo B et al*
2. *JID 2012:205 (15 April) d Grennan et al*
3. *J AIDS 2019, 33:2005–2012 Fleming et al.*
4. *J AIDS 2007 (August 15) L Jones et al*

Methods

- 2405 ART-naïve adults ≥19 years who commenced ART in British Columbia between January 1st 2010 and December 31st 2018 were included
- They achieved sustained VS (3 consecutive plasma pVL<40 c/ml) and had a follow-up period of 12 months minimum
- VB was defined as an isolated pVL between 40 to 1000 c/ml returning to pVL <40 c/ml within 3 months
- LLV was defined as persistent detectable pVL between 40-1000 c/ml
- Multivariable Cox proportional hazard models adjusting for demographic and clinical variables, including ART were used to model the hazard of experiencing VB.

Results

Characteristics of 2405 participants at Baseline		
Male sex (n, %)	2031	84%
Age, years (median,Q1-Q3)	41	31-49
CD4 cells/µL, (median,Q1-Q3)	360	219-540
pVL log10 copies/mL (median, Q1-Q3)	4.73	4.2-5.0
Pre-ART Genotypic Resistance (n, %)	237	10%

Viral Response During Study Period in 2405 participants		
Sustained VS	1507	63%
One or more VB	322	13%
LLV	381	16%
VF	132	5%
Lost to follow up	63	3%

Multivariable cox proportional hazard model- Time to 1st VB, censor at 1st ART switch N= 1505 (VB= 209)

Variable	Unadjusted HR	P-value	Adjusted-HR	P-value
Baseline CD4 cell count (per 100 increments)	0.89 (0.84-0.95)	0.001		
Baseline pVL (log 10)	2.62 (1.94-3.54)	0.001	2.38 (1.75-3.24)	<0.001
Time to VS (months)	1.04 (1.03-1.06)	0.001	1.03(1.01- 1.05)	0.009
Initial ART Regimen				
NRTI+ PIb	1.00			
NRTI+INSTI	0.70 (0.49-0.99)	0.05		
NRTI+NNRTI	0.84 (0.61-1.16)	0.29		
NRTI+ PI (unboosted)/>3 drugs regimes	1.13 (0.4-3.08)	0.81		

VS: viral suppression, VB : viral blip, LLV : low level viremia, VF: viral failure (pVL>1000 c/ml) after VS, NRTI: Nucleoside reverse transcriptase inhibitors, NNRT:Non-nucleoside reverse transcriptase inhibitors ,PI: Protease inhibitors, INSTI: Integrase strand transfer inhibitors

Conclusions

- In this cohort of PLWH who achieved VS after ART initiation, there was an overall low incidence rate of VB (3.91 per a 100 person year, 95% CI (3.52-4.33))
- Viral blips were associated with higher baseline pVL and longer time to viral suppression after ART initiation
- There was no association between any of the ARV classes and viral blips
- Subsequent virologic failure was low. For individuals with VB was 4% (14/322) and in LLV 2% (8/381)
- Further studies are necessary to fully understand the clinical impact of VB and LLV