Low tenofovir and XTC HIV drug resistance prevalence among recently diagnosed HIV-positive men who have sex with men in a setting of high PrEP use

Authors:
King J M[1*], Di Giallonardo F[1*], Shaik A[1], McGregor S[1], Yeung J Y K[2], Sivaruban T[3], Lee F J[4,5], Cunningham P[2], Dwyer D E[3], Nigro S J[6], Grulich A E[1], and Kelleher A D[1].

[1]The Kirby Institute, The University of New South Wales, Sydney 2052, Australia, [2]New South Wales State Reference Laboratory - HIV/AIDS, St Vincent's Hospital, Sydney 2010, Australia, [3]New South Wales Health Pathology-ICPMR, Westmead Hospital, Westmead 2145, Australia, [4]New South Wales Health Pathology-RPA, Royal Prince Alfred Hospital, Camperdown 2050, Australia, [5]Department of Clinical Immunology and Allergy, Royal Prince Alfred Hospital, Camperdown 2050, Australia, [6]Health Protection NSW, Sydney 2059, Australia

*Authors contributed equally to the study.

Background:
NSW has one of the world's highest uptake rates of HIV pre-exposure prophylaxis (PrEP). This uptake has been credited with sharp declines in HIV transmission, particularly among Australian-born gay and bisexual men. Concerns have been raised around the potential emergence of TFV (tenofovir) and XTC (lamivudine/emtricitabine) resistance in settings of high PrEP use, which could increase treatment failure and associated clinical outcomes among PLHIV. Despite low levels of nucleoside reverse-transcriptase inhibitor (NRTI) resistance relating to PrEP use in clinical settings, there are few published studies describing the prevalence of NRTI resistance among people newly-diagnosed with HIV in a setting of high PrEP use.

Methods:
Using HIV antiretroviral drug resistance data linked to NSW HIV notifications records of people diagnosed from 2015 to 2021 and with HIV attributed to male-to-male sex we described trends in TFV and XTC resistance. Resistance was identified using the Stanford HIV Drug Resistance genotypic resistance interpretation system. To focus on transmitted drug resistance, resistance prevalence estimates were generated using sequences taken <3 months post-HIV-diagnosis, and were stratified by age at diagnosis, year of sequencing, birthplace, likely place of HIV acquisition, and stage of HIV at diagnosis.

Results:
Among 1,119 diagnoses linked to HIV genomes sequenced less than three months following diagnosis, overall XTC resistance prevalence was in 1.3%. Between 2015 and 2021, XTC resistance fluctuated between 0.5% to 2.9% and was 1.0% in 2021. No TFV resistance was found over the study period. Higher XTC resistance prevalence was observed among people with newly acquired HIV (evidence of HIV acquisition in the 12 months prior to diagnosis; 2.9%, $p=0.008$).

Conclusions:

In this Australian setting, TFV and XTC resistance prevalence in new HIV diagnoses remained low. Our findings offer further evidence for the safe scale-up of PrEP in high-income settings, without jeopardising the treatment of those living with HIV.

Disclosure of interest statement:
ADK and FDG were funded by the Medical Research Future Fund (MRFF) Genomics Health Futures Mission - Pathogens Genomics Grant Opportunity (FSPGN000047). The Kirby Institute also receives funding from the Australian Government Department of Health and Aged Care.