Scaling up of Triggered Viral load in Rural Zimbabwe Implications for Phasing out of Stavudine

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Introduction

Viral load testing is limited in resource poor settings due to feasibility and cost. In 2011, triggered by the need to identify virological failure prior to switching patients from Stavudine (d4T) to Tenofovir (TDF) Médecins Sans Frontières (MSF) in collaboration with the Zimbabwean Ministry of Health and Child Welfare (MoHCW) scaled up access to viral load in their HIV/TB programme. The programme was situated in the rural district of Buhera with HIV/TB services provided at two rural hospitals and 22 primary health care clinics.

Methods

Viral load was initially performed for those patients with clinical or immunological failure (CD4 drop of > 30%) and those eligible to be switched from d4T to TDF due to d4T side effects. Access to viral load was then further extended to consecutive patients switching from d4T to TDF who were six months or more on ART.

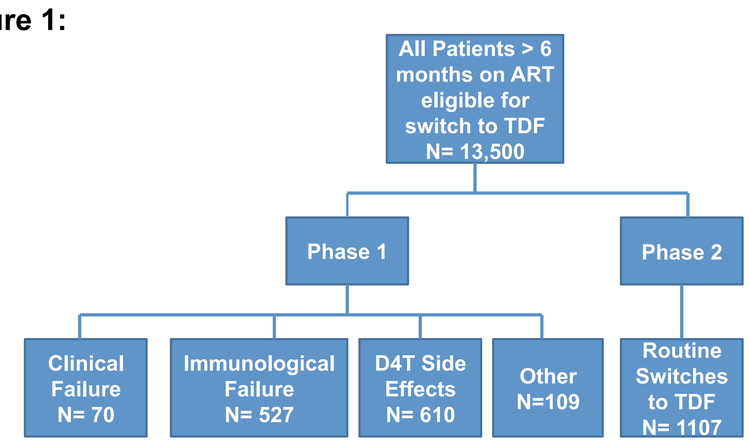
To overcome the challenges of sample transport, dried blood spots were prepared using whole blood collected in EDTA tubes and five spots of 50ul pipetted onto Whatman 903® Specimen Collection Paper. Viral load was then performed using the NucliSens EasyQ viral load platform.

Data were abstracted from clinical and laboratory records and analysed using STATA (version 11). Poisson regression was used to estimate risk ratios (RRs) to identify factors associated with viraemia (> 1000 copies/ml) among routine patients (no evidence of clinical, immunological failure or D4T side effects) having viral load tested prior to switching from d4T to TDF. Time on ART stratified by < 1 year, 1-3 years and > 3 years was included a priori.

Results

Patient inclusion for the analysis is shown in Figure 1.

Figure 1:



Viral load was > 1000 copies in 33% (95% CI:19-47%) of patients with clinical failure; 34% (95% CI:30-39%) of patients with immunological failure and 12% (95% CI:9-14.3%) of patients with d4T side effects. Baseline characteristics of those routinely switching are shown in Table 1. Of those routinely switched 185 (16.7%) had a detectable VL >1000 copies/ml (95%CI 14.5-18.9) and 122 (11.0%) had a viral load 400-1000 copies/ml.

Multivariate analysis found that in those routinely switched a viral load of > 1000 copies/ml was significantly associated with age less than 50 years and low CD4 count at time of VL measurement.

Table 1: Baseline Characteristics of Routine Switches

Variable	Patients For Routine Switch
Age (median, IQR)	38.5 (32-47) years
Male n (%)	361 (32.7)
Baseline CD4 (median, IQR)	185 (90-290) cells/uL
CD4 count at time of viral load measurement (median, IQR)	436 (288-647) cells/uL

Table 2: Multi and Univariate Analysis: Risk Factors for VL > 1000 copies

Variable	Univariate risk ratio (95% CI)	Multivariate risk ratio (95% CI)
Time on ART < 1 year	1	1
Time on ART 1-3 year	0.84 (0.54-1.32)	0.99 (0.61-1.58)
Time on ART > 3 year	0.66 (0.42-1.05)	0.91 (0.55-1.50)
Age < 50 years	1	1
Age > 50 years	0.40 (0.28-0.55)	0.40 (0.29-0.56)
Men	1	
Women	0.96 (0.73-1.27)	
Baseline CD4 count <100 cells/uL	1	
Baseline CD4 count >100 cells/uL	0.90 (0.68-1.18)	
Current CD4 count < 200 cells/uL	1	1
Current CD4 count 200-350 cells/uL	0.60 (0.40-0.91)	0.62 (0.42-0.92)
Current CD4 count > 350 cells/uL	0.58 (0.41-0.82)	0.54 (0.38-0.77)

Conclusion

- **These findings confirm the importance of measuring viral load among patients with clinical or immunological signs of treatment failure before a switch to second line is made.**
- **A significant proportion of patients eligible for switch to TDF had undiagnosed viraemia reflecting either poor adherence or resistance.**
- **In light of the low genetic barrier of TDF the consequences of switching to a TDF containing first line in the presence of undiagnosed viraemia is unclear and may compromise the use of TDF in second line.**
- **Where countries may consider switching all patients to TDF without viral load these risks should be considered.**

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