Kidney Dysfunction in Young People Living With HIV on Dolutegravir-Based Regimens in Kampala, Uganda

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BACKGROUND

- Young people living with HIV (YPLHIV) are at increased risk of developing kidney dysfunction due to antiretroviral therapy (ART).
- We explored the association of dolutegravir (DTG)-based ART regimens with kidney dysfunction among YPLHIV in Kampala, Uganda.

METHODS

- A cross-sectional study with YPLHIV aged 10-24 years in seven HIV clinics in Kampala.
- We collected urine and blood samples. Measured the albumin creatinine ratio (ACR), proteinuria on dipstick, creatinine, cystatin C and estimated glomerular filtration rate (eGFR) using CKDEPI2021 equation or Bedside Schwartz (<18 years).
- We compared eGFR from the different equations using kernel density plots.
- We used chi-square tests to compare kidney function parameters of participants on tenofovir disoproxil fumarate (TDF), lamivudine (3TC) and DTG vs those on DTG combined with either zidovudine or abacavir and 3TC (other regimens).

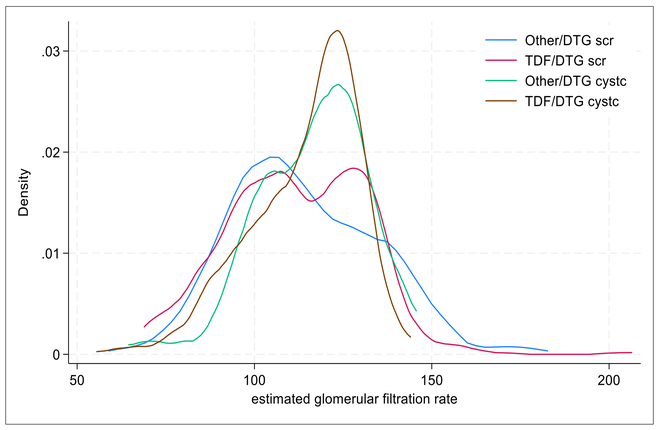
RESULTS

- 483 YPLHIV were enrolled (58% female, 69% aged 10-17 years).
- The median duration on ART was 9.6 years (IQR 8,12). Mean BMI and mid-upper arm circumference were higher among YPLHIV on TDF/DTG (Table 1)
- Serum creatinine levels were different across the groups. Cystatin C was comparable in both groups.

While kidney function was comparable among YPLHIV on DTG-based regimens with and without TDF, we found a high prevalence of increased albumin creatinine ratio.

- The mean eGFR was within normal limits and lower among those on TDF/DTG compared to those on other regimens.
- The eGFR according to cystatin C was comparable.
- The proportion of YPLHIV with ACR>30mg/g and proteinuria were high but comparable. Table 2.
- eGFR calculated from either serum creatinine or cystatin C was similar in both groups (Fig 1)3

Figure 1. Kernel density plot of the different eGFR



Other: Abacavir or zidovudine based regimen, Scr: serum creatinine, DTG: dolutegravir, TDF: tenofovir disoproxil fumarate, cystc: cystatin C

Table 1: Participant demographics and clinical features

	TDF/DTG N=367	Other/DTG N=116	p-value
Mean Age in years (SD)	17.0 (3.5)	14.4 (3.4)	<0.001
10 to 17	231 (62.9%)	93 (80.2%)	<0.001
18 to 24	136 (37.1%)	23 (19.8%)	
Sex			
Male	156 (42.5%)	54 (46.6%)	0.44
Female	211 (57.5%)	62 (53.4%)	
Socioeconomic status			
Lowest	129 (35.1%)	44 (37.9%)	0.86
Middle	114 (31.1%)	35 (30.2%)	
Highest	124 (33.8%)	37 (31.9%)	
Body mass index			
Normal	224 (61.2%)	44 (37.9%)	<0.001
Underweight	106 (29.0%)	67 (57.8%)	
Overweight	36 (9.8%)	5 (4.3%)	
Stunting			
Not stunted	221 (84.0%)	80 (79.2%)	0.28
Stunted	42 (16.0%)	21 (20.8%)	
Mid upper arm circumference			
Normal	338 (92.3%)	100 (86.2%)	0.045
Malnourished	28 (7.7%)	16 (13.8%)	
Weight (kg)	51.2 (11.5)	41.9 (12.7)	<0.001
Viral suppression			
Suppressed	331 (90.9%)	101 (87.1%)	0.23
Unsuppressed	33 (9.1%)	15 (12.9%)	
Muscle mass			
Normal	294 (85.5%)	91 (84.3%)	0.76
Abnormal	50 (14.5%)	17 (15.7%)	

SD: standard deviation, viral suppression <1000cells/ml, other AZT or ABC and 3TC plus DTG

Table 2: Participant Kidney Parameters by Regimen

Variable	TDF/DTG N=367	Other /DTG N=116	p-value
Proteinuria			
Negative	263 (71.7)	81 (69.8)	0.70
Positive	104 (28.3)	35 (30.2)	
Albumin creatinine ratio			
Below 30mg/g	328 (90.4)	100 (87.0)	0.29
Above 30mg/g	35 (9.6)	15 (13.0)	
Cystatin C Mean(SD)	0.81 (0.13)	0.81 (0.12)	0.78
eGFR cystatin C	114.2 (15.2)	116.5 (15.3)	0.15
Serum creatinine Mean (SD)	0.68 (0.15)	0.59 (0.14)	<0.001
eGFR serum creatinine	118.8 (19.3)	113.9 (20.1)	0.32

CONCLUSIONS

- Abnormal ACR and proteinuria are prevalent among YPLHIV in Uganda, and similar by ART regimen.
- Creatinine was largely within normal limits.
- Longer-term follow-up is needed to understand whether YPLHIV on ART will develop chronic kidney disease as they age, and to elucidate risk factors for kidney disease progression.

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