HIGH DRUG RESISTANCE AND NEED FOR ART CHANGE IN CHILDREN WITH VIRAL FAILURE IN KENYA

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BACKGROUND

Drug resistance (DR) in children living with HIV (CHIV) on antiretroviral treatment (ART) threatens to undermine global HIV targets to achieve viral suppression and health outcomes for CHIV.

We present DR testing results and outcomes for CHIV with virologic failure (VF) in the randomized controlled Opt4Kids trial.

METHODS

- CHIV ages 1-14 years on ART were enrolled in the Opt4Kids study from 5 government facilities in Kisumu County, Kenya March to December 2019
- CHIV were randomized 1:1 to control (standard-of-care) or intervention (point-of-care viral load testing every three months with targeted DR testing (DRT) with VF (≥ 1000 copies/ml)).
- CHIV in control group with VF underwent DRT at study end only
- A multidisciplinary clinical management committee reviewed DRT results and gave management recommendations
- DR patterns and clinical outcomes of CHIV undergoing DRT in intervention group are described
- DRM interpretation defined per Stanford Genotypic Resistance Interpretation Algorithm

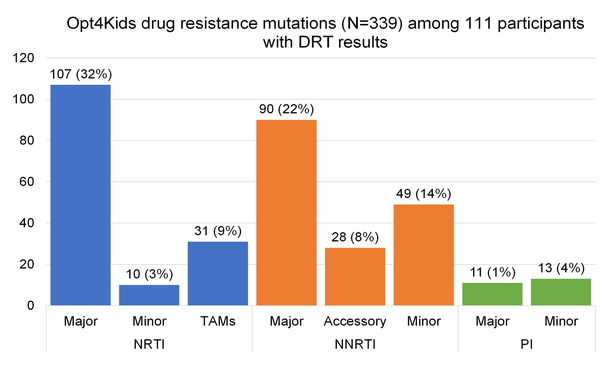

Figure 1. Drug resistance mutations by class among CHIV with virologic failure (N=111)

Among CHIV with virologic failure (VF), 84% had major HIV drug resistance (DR) mutations.
Among CHIV with VF and DR testing, viral suppression in those who had a recommended change in ART was 22/38 (58%) versus 11/34 (32%) in those without recommendation to change ART (p=0.04).

RESULTS

- A total of 704 CHIV were enrolled in the study with a median age 9 years (interquartile range [IQR] 7, 12) and median time on ART of 5.8 years (IQR 3.1, 8.6)
- Among 349 CHIV in the intervention group, 94 (27%) had one or more episodes of VF of which 89 (94%) had at least one DRT. An additional 22/341 (6%) CHIV in the control group had DRT at study end.
- 111/111 (100%) of children with a DRT had DR mutations identified and 89% had major DRM mutations (**Figures 1 and 2**):

- **Drug resistance summary among CHIV in both arms with major DRM:**
  - 91 (92%) NNRTI
  - 71 (72%) NRTI
  - 11 (11%) PI
  - 54 (55%) with dual class NRTI-NNRTI
  - 9 (9%) triple-class DR

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Figure 2. Drug resistance mutation distribution among CHIV with virologic failure (N=111)

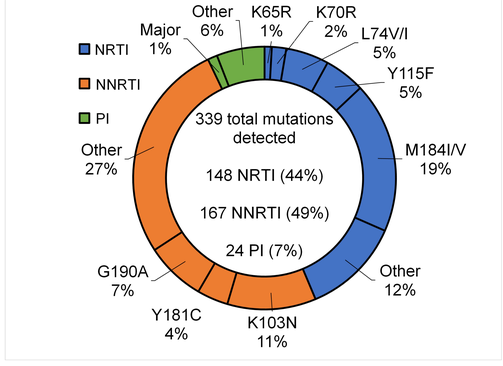

Table 1: Clinical outcomes of children with viremia undergoing DRT in intervention group

	Total children with DRT results (intervention)	Children changing ART due national DTG transition	Children recommended to change ART after DRT review	Children without ART change recommendation after DRT review
12-month viral load	N=84(%)	N=12(%)	N=38[1](%)	N= 34(%)
Suppressed	42 (50)	9(75)	22(58)	11(32)
Not suppressed	28 (33)	3(25)	11(29)	14(41)
Lost to follow up	9 (11)	0(0)	3(8)	6(18)
Died	1 (1)	0(0)	0(0)	1(3)
Missing VL	4 (5)	0(0)	2(5)	2(6)

[1] includes three children recommended to change ART who had not by study end
DRT=drug resistance test DTG=dolutegravir

After clinical review (intervention group):

- 38/84 (45%) ART change recommended
  - 35 (92%) changed regimens by study end
- 12 (14%) additional CHIV optimized to dolutegravir (DTG) under national programmatic transition
- 34 no ART change recommended
  - The majority (29; 85%) were on protease inhibitor (PI)-based ART without any major PI DR

Excluding those with programmatic ART changes, the study viral suppression (VS) outcome at 12 months showed VS in 22/38 (58%) with recommendation to change ART and 11/34 (32%) without recommendation to change ART (p=0.04; **Table 1**)
Additionally, ART-suppression was observed in 9/12 (75%) with programmatic switch to DTG

CONCLUSIONS

Over 80% of CHIV undergoing targeted DRT had major drug mutations detected.

Optimization of ART by targeted use of DRT or programmatic switch to DTG-based-ART improves viral suppression and retention.

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