Dolutegravir and Incident Diabetes Mellitus in West African People Living with HIV

Thierry Tiendrebeogo[1], Romain Millot[1,2], Karen Malateste [1], Armel Poda[3], Albert Minga[4], Eugene Messou[5], Henri Chenal[6], Igho Ofotokun[7], Didier Ekouevi[1,8], Antoine Jaquet [1], on behalf of the IeDEA Global consortium

1. University of Bordeaux, National Institute for Health and Medical Research (INSERM) UMR 1219, Research Institute for Sustainable Development (IRD) EMR 271, Bordeaux Population Health Research Centre, Bordeaux, France; 2. CHU Poitiers, Infectious Agents Department, Poitiers, France; 3. Department of Infectious Diseases, Université Nazi Boni, Bobo-Dioulasso, Burkina Faso; 4. Programme PAC-CI, Abidjan, Côte d'Ivoire; 5. Centre de Prise en charge de Recherche et de Formation, Abidjan, Côte d'Ivoire; 6. Centre Intégré de Recherches Biocliniques d'Abidjan; 7. Division of Infectious Diseases, Department of Medicine, School of Medicine, Emory University, Atlanta, Georgia, USA; 8. Département de Santé Publique, Université de Lomé, Lomé, Togo

IeDEA west africa
International epidemiology Databases to Evaluate AIDS

#691

BACKGROUND

Diabetes mellitus (DM) is an emerging comorbidity among people living with HIV (PLHIV), driven by aging, obesity, and long-term antiretroviral therapy (ART) exposure. Dolutegravir (DTG), now recommended as first-line ART worldwide, has been associated with weight gain and metabolic disturbances. However, data on incident diabetes in African cohorts initiating DTG remain limited. We aimed to estimate the 2-year cumulative incidence of DM and to identify its predictors, with a particular focus on DTG exposure at ART initiation, in a large West African cohort of PLHIV.

METHODS

Retrospective cohort analysis using the IeDEA West Africa database (2009–2023), including 4 HIV clinics routinely collecting fasting glycaemia (Abidjan, Côte d'Ivoire [n=3] and Bobo-Dioulasso, Burkina Faso [n=1]).

Eligible participants:

- Adults initiating ART
- Baseline fasting glycaemia within ±3 months of ART initiation
- ≥1 follow-up fasting glycaemia
- No prevalent DM at baseline

Outcome definition:

Incident DM was defined as the first recorded fasting glycaemia ≥7.0 mmol/L (≥126 mg/dL) during follow-up

Statistical analyses

- Two-year cumulative incidence estimated using survival methods.
- Cause-specific Cox proportional hazards models to identify predictors.
- Body Mass Index (BMI) included as a time-varying covariate.
- Random effects for HIV clinics to account for clustering.

RESULTS

- **9,171 patients** were included contributing for **16,077 person-years (PY) of follow-up.**
- The **overall incidence of DM** was **2.46 [95% CI 2.23 –2.72]. per 100 PY**,
- **DM 2-year cumulative incidence was 4.8% [95% CI 4.4 – 5.3]**

As DTG becomes the cornerstone of first-line ART in Africa, we observed a nearly twofold increased risk of diabetes mellitus among individuals initiating DTG compared with efavirenz.

RESULTS, continued

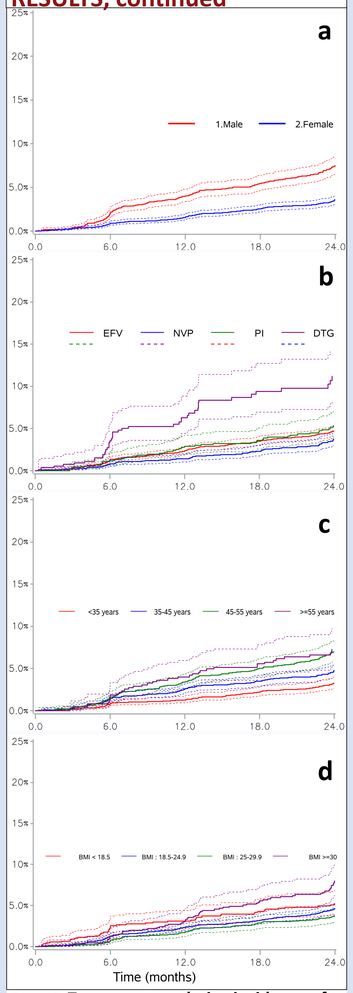


Figure1. **Two-year cumulative incidence of Diabetes mellitus** by **sex (a)**, ART backbone **(b)**, Age **(c)**, and body mass Index **(d)** at ART initiation

Strongest predictors of DM incidence:

- Prediabetes : aHR 2.60 [95% CI 1.95-3.47]
- Obesity (BMI ≥30): aHR 2.53 [95% CI 1.88-3.39]

Other independent predictors:

- Male sex: aHR 2.08 [95% CI 1.69-2.57]
- Age >55 years: aHR 1.66 [95% CI 1.13-2.43]
- DTG-based ART at initiation vs efavirenz: aHR 1.94 [95% CI 1.38-2.74]

Variable	PY	IR/100PY	aHR [95% CI]
Sex at birth			
Male	5 091	3.89	2.08 [1.68–2.57]
Female (ref)	10 987	1.80	Reference
Age at ART initiation			
<35 years (ref)	5 781	1.63	Reference
35–45 years	5 987	2.44	1.26 [0.97–1.64]
45–55 years	3 268	3.58	1.63 [1.23–2.16]
>55 years	1 041	3.75	1.66 [1.13–2.43]
ART regimen at initiation			
Efavirenz-based (ref)	9 230	2.42	Reference
Nevirapine-based	4 437	1.87	0.82 [0.63–1.05]
Protease inhibitor-based	1 690	2.72	1.10 [0.80–1.51]
DTG-based	720	6.11	1.94 [1.37–2.74]
BMI (time-varying)			
Underweight (<18.5)	2 243	2.14	0.99 [0.73–1.36]
Normal weight (ref)	9 486	2.28	Reference
Overweight (25–29.9)	3 135	2.17	0.98 [0.74–1.29]
Obese (≥30)	1 214	5.27	2.53 [1.88–3.39]
Prediabetes at ART initiation			
Yes	810	6.91	2.60 [1.95–3.47]
No (ref)	15 267	2.23	Reference

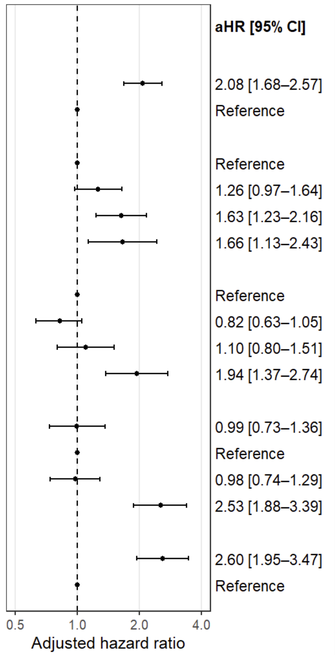


Figure 2. aHR, adjusted cause-specific Hazard Ratio estimated by Cox regression models; IR/100 PY, incidence rate per 100 person-years; BMI, Body Mass Index taken as a time dependent variable; Prediabetes, defined as first fasting glucose between 6.1 and 6.9 mmol/L (110–125 mg/dL)

RESULTS, continued

DTG-based ART regimen was independently associated with a significantly higher risk of incident diabetes compared to efavirenz .

CONCLUSIONS

- In this large West African cohort, incident DM occurred in nearly 5% of adults PLHIV within two years of ART initiation.
- While traditional risk factors such as obesity, prediabetes, older age, and male sex were strong predictors, dolutegravir initiation was independently associated with a higher risk of DM compared with efavirenz.
- Given the scale of DTG implementation across sub-Saharan Africa, surveillance of glycaemia should be prioritized together with proactive DM prevention and access to care for metabolic disorders within HIV programs.

CORRESPONDING AUTHOR

Thierry TIENDREBEOGO

kiswend-sida-thierry.tiendrebeogo@u-bordeaux.fr

ACKNOWLEDGMENTS

This work was supported by the National Institutes of Health's National Institute of Allergy and Infectious Diseases (NIAID), the Eunice Kennedy Shriver National Institute of Child Health & Human Development (NICHD), the National Cancer Institute (NCI), the National Institute on Drug Abuse (NIDA), the National Heart, Lung, and Blood Institute (NHLBI), the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the Fogarty International Center (FIC), the National Library of Medicine (NLM), and the Office of the Director (OD): West Africa, U01AI069919. Informatics resources are supported by the Harmonist project, R24AI24872. This work is solely the responsibility of the authors and does not necessarily represent the official views of any of the institutions mentioned above. The authors would like to thank all collaborators of participating sites for their contributions to this work.

PLAIN LANGUAGE SUMMARY

As newer HIV medicines are introduced across Africa, we found that people starting dolutegravir were more likely to develop diabetes than those starting older treatments. Monitoring blood sugar levels should be part of routine HIV care.

NIH National Institutes of Health · université de BORDEAUX · RÉPUBLIQUE FRANÇAISE Liberté Égalité Fraternité · Inserm La science pour la santé From science to health · IRD Institut de Recherche pour le Développement FRANCE · BORDEAUX POPULATION HEALTH · GHiGS Global Health in the Global South