POSTER #0652

Changes in Lipids After a Direct Switch from TDF to TAF

Patrick Mallon[1], Laurence Brunet[2], Jennifer Fusco[2], Girish Prajapati[3], Andrew Beyer[3], Gregory Fusco[2], Michael Wohlfeiler[4]

[1]University College Dublin School of Medicine, Dublin, Ireland; [2]Epividian, Durham, NC, USA; [3]Merck & Co., Inc., Kenilworth, NJ, USA; [4]AIDS Healthcare Foundation, Miami, FL, USA

Contact Information:
4505 Emperor Blvd., Suite 220, Durham, NC 27703
P: 919-827-0010 Email: laurence.brunet@epividian.com

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BACKGROUND

- TDF has been associated with lower lipid levels[1]
- Many patients on stable TDF-containing regimens have been switched to TAF-containing regimens with a focus on reducing bone and renal toxicity[2]
- The impact of removing TDF on lipids remains unclear in real-world clinical practice

OBJECTIVE:

To describe the change in serum total cholesterol (CHOL), low density lipoprotein cholesterol (LDL), high density lipoprotein cholesterol (HDL) and triglyceride (TG) levels in people living with HIV (PLWH) after they are switched from TDF- to TAF-based ARV regimens

METHODS

Study Population

- Data source: OPERA database of electronic health records from 93,170 PLWH (84 clinics, 18 U.S. states/territories)
- Inclusion Criteria:
  - HIV-positive, ≥18 years of age
  - On TDF ≥4 weeks, switched directly from TDF to TAF between 5NOV2015 and 31MAR2018
  - ≥1 lipid panel while on TDF ≤6 months before switch
  - ≥1 lipid panel at any time while on TAF
- Baseline date: date of switch from TDF to TAF
- Observation period: from TDF-to-TAF switch until 1) discontinuation of TAF, 2) cessation of continuous clinical activity (patients censored 12 months after their last contact), 3) death or 4) study end (30JUN2018).

Analyses

- Comparison of last lipid panel on TDF (pre-switch) and first lipid panel on TAF, ≥ 7 days after switch (post-switch): mean percentage change in lipids and 95% CI

$$\%\ change = 100 \times \frac{Lipid_{post} - Lipid_{pre}}{Lipid_{pre}}$$

- Severity of dyslipidemia was categorized based on the NCEP ATPIII guidelines (Table 1)
- Comparison pre- vs. post-switch dyslipidemia severity: Pearson's Chi-square test
- Stratification by boosting agent use pre- and post-switch
- Sensitivity analysis: restricted to PLWH without any change in ART other than switch from TDF to TAF

Table 1. Categorization of Lipid Levels (NCEP ATPIII)

	CHOL (mg/dL)	LDL (mg/dL)	HDL (mg/dL)	TG (mg/dL)
Severe dyslipidemia	≥ 280	≥ 160	NA	≥ 500
Dyslipidemia	≥ 240 to < 280	≥ 130 to < 160	< 40	≥ 200 to < 500
Borderline abnormal	≥ 200 to < 240	≥ 100 to < 130	≥ 40 to < 60	≥ 150 to < 200
Normal	< 200	< 100	≥ 60	< 150

RESULTS

Table 2. Demographic and clinical characteristics at switch (N=6451)

	At switch n (%)
Age ≥ 50 years	2769 (42.9)
Female	1010 (15.7)
African American	2126 (33.0)
Hispanic	1870 (29.0)
HIV RNA <200 copies/mL	5473 (84.8)

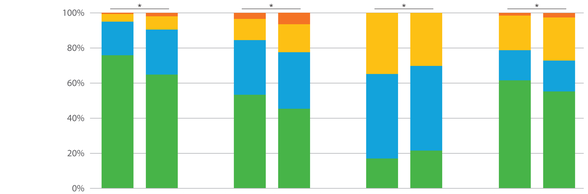
Table 3. ARV and statin use pre- and post-switch (N=6451)

	Pre-switch n (%)	Post-switch n (%)
PI	1566 (24.3)	1228 (19.0)
NNRTI	2319 (35.9)	1546 (24.0)
INSTI	3007 (46.6)	4185 (64.9)
≥1 anchor agent	527 (8.2)	563 (8.7)
Boosting agent	3292 (51.0)	3987 (61.8)
Statin	971 (15.1)	1696 (26.3)

Table 4. Percent change in lipids after switch from TDF to TAF, complete population stratified by boosting agent use pre- and post-switch (N=6451)

Pre-switch	Post-switch	n	CHOL % change (95% CI)	LDL % change (95% CI)	HDL % change (95% CI)	TG % change (95% CI)
Boosted	Non-boosted	165	2.3 (-0.6, 5.2)	5.1 (0.1, 10.1)	7.2 (-0.4, 14.8)	15.6 (4.6, 26.7)
Non-boosted	Boosted	861	7.6 (6.3, 9.0)	10.3 (8.0, 12.7)	5.9 (4.2, 7.6)	25.4 (20.8, 29.9)
Boosted	Boosted	3126	8.8 (8.1, 9.5)	13.3 (9.7, 17.0)	7.7 (6.4, 9.1)	24.4 (21.9, 26.9)
Non-boosted	Non-boosted	2298	7.0 (6.3, 7.8)	8.8 (7.5, 10.0)	6.7 (5.3, 8.1)	22.9 (20.0, 25.8)

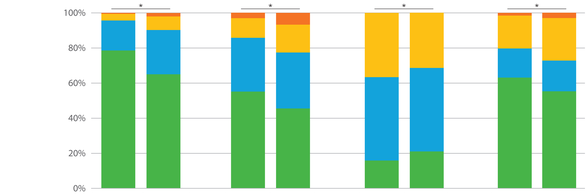
Figure 1. Lipids before and after switch from TDF to TAF, complete population (N=6451)



	CHOL TDF	CHOL TAF	LDL TDF	LDL TAF	HDL TDF	HDL TAF	TG TDF	TG TAF
Severe	0.7%	1.9%	3.4%	6.5%	NA	NA	1.5%	2.5%
Dyslipidemia	4.4%	7.6%	12.1%	16.0%	34.8%	30.2%	19.7%	24.5%
Borderline	19.1%	25.6%	31.1%	32.2%	48.1%	48.2%	17.2%	17.6%
Normal	75.9%	64.9%	53.4%	45.4%	17.1%	21.6%	61.6%	55.3%

* p-value for the pre-post switch comparison <0.0001

Figure 2. Lipids before and after switch from TDF to TAF, no other change in ART (N=4328)



	CHOL TDF	CHOL TAF	LDL TDF	LDL TAF	HDL TDF	HDL TAF	TG TDF	TG TAF
Severe	0.5%	1.9%	3.1%	6.7%	NA	NA	1.5%	3.0%
Dyslipidemia	3.8%	7.7%	11.2%	15.9%	36.7%	31.5%	18.8%	24.3%
Borderline	17.1%	25.3%	30.7%	31.9%	47.5%	47.6%	16.6%	17.5%
Normal	78.6%	65.0%	55.1%	45.5%	15.8%	21.0%	63.1%	55.3%

* p-value for the pre-post switch comparison <0.0001

Figure 3. Percent change in lipids after switch from TDF to TAF

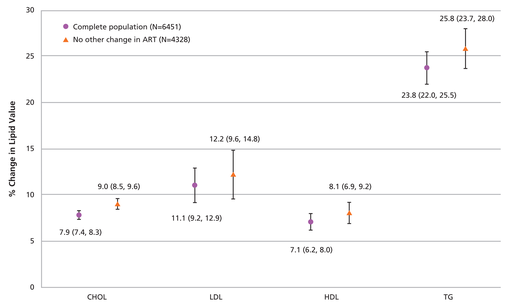


Figure 4. Lipids before and after switch from TDF to TAF, complete population stratified by boosting agent use pre- and post-switch (N=6451)

* p-value for the pre-post switch comparison <0.0001

DISCUSSION

- Switching from TDF to TAF was associated with worsening CHOL, LDL and TG in large, diverse population of PLWH in the U.S.
  - Consistent with previous TDF-to-TAF switch studies[3]
- Switching from TDF to TAF was associated with development of less favorable lipid profiles
- Lipid changes were not driven by boosting agent use
  - Less favorable lipid profiles after switch regardless of boosting agent use
- Lipid changes were not driven by other ART components
  - Less favorable lipid profiles after switch in PLWH whose only ART change was TDF to TAF
- Although there is increased statins use, the clinical implications on CVD risk remain to be determined

KEY FINDINGS:

- Switching from TDF to TAF was associated with development of less favorable lipid profiles
- Lipid changes seem to arise as a direct result of switch from TDF to TAF
- Differences are not driven by boosting agents

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