REAL-WORLD PERSISTENCY OF PATIENTS RECEIVING TENOFOVIR-BASED PRE-EXPOSURE PROPHYLAXIS FOR THE PREVENTION OF HIV INFECTION IN THE US

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Introduction

- Once-daily tenofovir-based combinations TRUVADA® (FTC/TDF) and DESCOVY® (FTC/TAF) are approved as pre-exposure prophylaxis (PrEP) for the prevention of HIV infections by the FDA
- Both regimens have been shown to be an effective HIV prevention strategy for populations vulnerable to acquiring HIV-1[1-5]
- However, low adherence can lead to poor effectiveness[6-8]
  - Adherence and patterns of consistent daily oral PrEP use in recent clinical trials was high but may differ from that observed in real world settings[9-10]
- The objective of this study was to describe the characteristics and usage patterns of commercially-insured PrEP users in the US

Methods

Study Design and Sample

- This retrospective cohort study used insurance claims data from the IQVIA® PharMetrics® Plus database (1/1/2015 – 3/31/2020)
- Adults newly initiated on PrEP were selected based on the following criteria:
  - ≥1 dispensing of FTC/TDF or FTC/TAF with ≥30 days of supply (first dispensing = index date)
  - ≥6 months of continuous insurance eligibility prior to the index date (baseline period)
  - ≥18 years of age at the index date
- The following exclusion criteria were also applied:
  - Dispensing for both FTC/TDF and FTC/TAF on the index date
  - ≥1 dispensing of FTC/TDF or FTC/TAF with <30 days of supply any time before or on the index date (ie, post-exposure prophylaxis)
  - ≥1 diagnosis of HIV-1 during the baseline period or on the index date
  - ≥1 diagnosis of HIV-2 any time during the eligibility period
  - ≥1 dispensing of an antiretroviral therapy (ART) for HIV (other than FTC/TDF and FTC/TAF) during the baseline period or on the index date

Study Periods

- Characteristics of PrEP users were described during the 6-month baseline period
- Proportion of days covered (PDC), persistence, treatment breaks, and switching were described for FTC/TDF users during the follow-up period
  - The follow-up period spanned from the index date to the end of health plan coverage or end of data
  - Due to limited time of availability following marketing authorization, post-index outcomes for FTC/TAF users were not described
- For PDC and persistence, the follow-up period was censored at HIV infection, which was defined by both ART initiation and HIV diagnosis (earliest of the two events)

Outcomes and Data Analysis

- PDC was calculated for each user as the total number of days with the index medication (FTC/TDF) on hand during the time interval of interest (ie, 6 and 12 months) divided by the duration of the interval of interest
  - Mean PDC was calculated in addition to the proportion of users maintaining PDC levels ≥0.7 and ≥0.6
  - PDC levels of ≥0.7 and ≥0.6 served as a proxy to estimate users who maintained at least 4 days per week of FTC/TDF use
- Non-persistence was defined as a >90-day gap from the last day of supply to the next dispensing or end of follow-up
  - Proportion of persistent users over time was assessed with Kaplan-Meier analysis
  - Re-initiation of PrEP after this gap indicated a treatment break

Results

User Characteristics

- 24,232 FTC/TDF and 1,187 FTC/TAF users were identified (Table 1)
- Overall, mean age was 35.1 years and 94.5% were male
  - FTC/TAF is not indicated for cisgender women
- Mean [median] length of follow-up was longer for FTC/TDF (504 [390] days) than FTC/TDF users (77 [70] days)
- Baseline demographics and clinical characteristics were similar across cohorts

Table 1. Baseline Demographics and Clinical Characteristics of PrEP Users by Regimen

Characteristics	PrEP Regimen	
	FTC/TDF (N= 24,232)	FTC/TAF (N= 1,187)
Observation period,[1] days, mean ± SD [median]	504 ± 408 [390]	77 ± 46 [70]
Demographics[2]		
Age, years, mean ± SD [median]	35.0 ± 11.3 [32]	36.6 ± 12.3 [33]
Male, n (%)	22,869 (94.4)	1,146 (96.5)
Region, n (%)		
South	10,217 (42.2)	680 (57.3)
Midwest	5,137 (21.2)	243 (20.5)
Northeast	5,260 (21.7)	152 (12.8)
West	3,617 (14.9)	112 (9.4)
Year of index date,[3] n (%)		
2015	2,146 (8.9)	0 (0.0)
2016	4,397 (18.1)	0 (0.0)
2017	4,901 (20.2)	0 (0.0)
2018	5,877 (24.3)	0 (0.0)
2019	5,972 (24.6)	481 (40.5)
2020	939 (3.9)	706 (59.5)
Quan-CCI,[4] mean ± SD [median]	0.12 ± 0.48 [0]	0.15 ± 0.58 [0]
Select comorbidities,[4] n (%)		
Hypertension	2,893 (11.9)	184 (15.5)
Obesity	1,752 (7.2)	112 (9.4)
Diabetes	962 (4.0)	60 (5.1)
Renal failure	67 (0.3)	8 (0.7)
Hepatitis B	59 (0.2)	4 (0.3)
STI diagnosis,[4] n (%)		
Any STI	2,326 (9.6)	94 (7.9)
Human papillomavirus	796 (3.3)	35 (2.9)
Unspecified venereal diseases	641 (2.6)	32 (2.7)
Syphillis	537 (2.2)	22 (1.9)
Gonorrhea	425 (1.8)	21 (1.8)

FTC: emtricitabine; HIV: human immunodeficiency virus; PrEP: pre-exposure prophylaxis; Quan-CCI: Quan-Charlson comorbidity index; SD: standard deviation; STI: sexually transmitted infection; TAF: tenofovir alafenamide; TDF: tenofovir disoproxil fumarate.
Notes: 1. The observation (follow-up) period spanned from the index date until the earliest of end of continuous eligibility or end of data availability. 2. Evaluated on the index date. 3. The index date was defined as the date of the first dispensing for FTC/TDF or FTC/TAF. 4. Evaluated during the 6-month baseline period, excluding the index date.

PrEP Usage Patterns

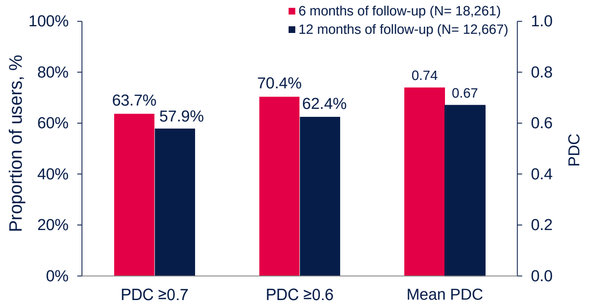
- On average, FTC/TDF users had 9.0 dispensings with 38.3 days of supply per dispensing over follow-up (Table 2)
- 11.1% had ≥1 break in PrEP use, with a mean break length of 249 days
- Among those initiated on FTC/TDF, 10.8% switched to FTC/TAF
  - Only 10 users (0.8%) switched from TAF to TDF-based PrEP due to limited time of follow-up since FTC/TAF approval (data not shown)
- Among FTC/TDF users, 20.0% had ≥1 STI diagnosis over the follow-up period

Table 2. Treatment Patterns of FTC/TDF Users

PrEP Use Patterns	FTC/TDF (N= 24,232)
Index PrEP regimen	
Duration of PrEP use,[1] days, mean ± SD [median]	354 ± 368 [220]
Number of dispensings, mean ± SD [median]	9.0 ± 9.7 [5]
Mean days of supply per dispensing, mean ± SD [median]	38.3 ± 18.6 [30]
Users with a PrEP dispensing with 28 days of supply, n (%)	52 (0.2)
PrEP regimen switching, n (%)	
Users switching between regimens (FTC/TDF to FTC/TAF)	2,606 (10.8)
Users switching from FTC/TDF to FTC/TAF, among those with an index date after:	
June 30, 2019 (n= 3,713)	471 (12.7)
September 30, 2019 (n= 2,006)	118 (5.9)
PrEP breaks	
Users with ≥1 PrEP break, n (%)	2,682 (11.1)
Users with ≥3 PrEP breaks, n (%)	85 (0.4)
Users with ≥5 PrEP breaks, n (%)	1 (0.0)
Number of PrEP breaks,[2] mean ± SD [median]	1.2 ± 0.5 [1]
Mean duration of PrEP breaks,[2] days, mean ± SD [median]	249 ± 189 [182]
STIs, n (%)	
Any STI	4,858 (20.0)
Human papillomavirus	1,665 (6.9)
Gonorrhea	1,566 (6.5)
Unspecified venereal diseases	1,335 (5.5)
Syphilis	1,201 (5.0)

FTC: emtricitabine; PrEP: pre-exposure prophylaxis; SD: standard deviation; STI: sexually transmitted infection; TAF: tenofovir alafenamide; TDF: tenofovir disoproxil fumarate.
Notes: 1. Treatment duration was calculated as the time between the date of the first PrEP dispensing and end of the days of supply of the last dispensing. 2. Evaluated among users with ≥1 PrEP break.

Figure 1. Proportion of Days Covered[1] of FTC/TDF Users

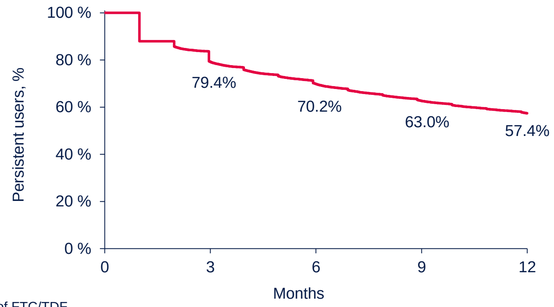


ART: antiretroviral therapy; FTC: emtricitabine; HIV: human immunodeficiency virus; PDC: proportion of days covered; TDF: tenofovir disoproxil fumarate.

Note: 1. PDC was calculated for each user as the total number of days with FTC/TDF on hand during the time interval of interest (ie, 6 and 12 months) divided by the duration of the interval of interest. The observation period spanned from the index date until the earliest of health plan disenrollment, end of data availability, or HIV infection. HIV infection was defined as the earliest date between an HIV diagnosis and multi-class ART initiation, where users required both a diagnosis and dispensing to be considered as having HIV infection.

- The mean PDC for FTC/TDF users at 6 and 12 months was 0.74 and 0.67, respectively, corresponding to 63.7% and 57.9% of users with PDC ≥0.70 (Figure 1)

Figure 2. Kaplan-Meier Persistence Rates[1] of FTC/TDF Users



No. of FTC/TDF users at risk[2]:					
	24,232	16,502	12,192	9,222	6,981

ART: antiretroviral therapy; FTC: emtricitabine; HIV: human immunodeficiency virus; PrEP: pre-exposure prophylaxis; TDF: tenofovir disoproxil fumarate.
Notes: 1. PrEP non-persistence was defined as a gap of >90 days between the end of the days of supply of a dispensing and the start date of the next fill or between the end of the days of supply of the last dispensing and the end of the observation period (censored at incidence of HIV infection). HIV infection was defined as the earliest date between an HIV diagnosis and multi-class ART initiation, where users required both a diagnosis and dispensing to be considered as having HIV infection. 2. Number of users still observed at the specific point in time.

- Persistence to FTC/TDF at 6 and 12 months was 70.2% and 57.4%, respectively (Figure 2)

Conclusions

- Characteristics of PrEP users at initiation are broadly similar between regimens
- Switching from FTC/TDF to FTC/TAF is common
- Breaks in PrEP use were observed in >11% of users and tended to last for several months
- Continued STI diagnoses after PrEP initiation suggest continued risk for HIV acquisition and the need for consistent PrEP utilization
- FTC/TDF users had lower real-world PDC and persistence than that observed in recent clinical trials (eg, DISCOVER[9] and HPTN 083[10])

Acknowledgment
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