TRAJECTORIES OF ADHERENCE TO PRE-EXPOSURE PROPHYLAXIS (PREP) AND RISK OF HIV INCIDENCE

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Introduction

- Preexposure prophylaxis (PrEP) is effective in preventing HIV transmission.[1,2] However, non-adherence limits its efficacy.
- Group-based trajectory modeling (GBTM) can be used to identify meaningful subgroups of PrEP use adherence trajectories with potentially different HIV risk Profiles.
- Objective : Examine the association between adherence trajectories of PrEP use and the risk of HIV acquisition

Methods

- Retrospective cohort study using 2012-2021 MarketScan data
- Study Population: Patients 12-64 years of age prescribed (≥30 days) tenofovir-disoproxil-fumurate and tenofovir-alafenamide with emtricitabine for PrEP.
- Index date: day 31 after PrEP initiation
- PrEP was identified using an algorithm developed by the CDC[3,4]
  - Additionally, we required no HIV outcome and continuous enrollment for 180 days after index date

Data analysis

- GBTM: Longitudinal assessment of 15-day PDC over 720 days after index date. Modelled the highest functional form with P<0.05, used BIC to compare models, and applied Nagin's criteria to assess model fitness.
- Inverse Probability Treatment Weighting (IPTW) Cox proportional hazards regression to compare risk of HIV between identified PrEP trajectory groups
  - Follow-up from 180 days after index until HIV outcome
  - HIV outcome: 1 inpatient /2 outpatient /2 backbone meds

Results

- We identified 23,327 new PrEP users. Many were male (96%), and aged 25-34 (33%) (**Table 1**).
- 4 unique trajectories identified: nonadherent(23%), rapidly-declining (16%), gradually-declining (21%), and consistently adherent (37%) groups **(Figure 1)**
- In regression models, compared to the consistently adherent group, nonadherent group an increased risk of HIV (HR 1.59 [1.07-2.38]) (**Table 2**)

Table 1: Demographic characteristics of PrEP users by trajectory group using 2012-2021 Marketscan database (N=23,327)

	Nonadherent	Rapidly declining	Gradually declining	Consistently adherent	Total	P-Value
N	6146	3807	4834	8540	23327	<0.01
Sex, Male	5455 (88.8%)	3686 (96.8%)	4738 (98%)	8416(98.5%)	22295 (95.6%)	<0.01
Age Group						<0.01
12-24	1995 (32.5)	973 (25.6%)	1002 (20.7%)	740 (8.7%)	4710 (20.2%)	
25-34	1939 (31.5)	1356 (35.6%)	1719 (35.6%)	2625 (30.7%)	7639 (32.7%)	
35-44	1087 (17.7)	711 (18.7%)	1080 (22.3%)	2282 (26.7%)	5160 (22.1%)	
>=45	1125 (18.3)	767 (20.1%)	1033 (21.4%)	2893 (33.9%)	5818 (24.9%)	
Alcohol use disorder	156 (2.5)	99 (2.6)	101 (2.1)	153 (1.8)	509 (2.2)	<0.01
Substance Abuse	436 (7.1)	226 (5.9)	266 (5.5)	333 (3.9)	1261 (5.4)	<0.01
SMI	1108 (18)	600 (15.8)	751 (15.5)	1058 (12.4)	3517 (15.1)	<0.01
Previous STI	580 (9.4)	391 (10.3)	571 (11.8)	955 (11.2)	2497 (10.7)	<0.01

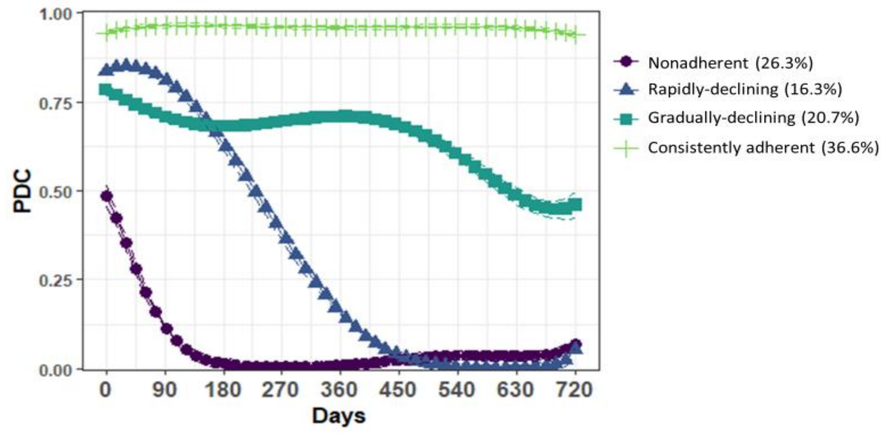
SMI: Serious Mental illness (bipolar disorder, panic disorder, PTSD, OCD, borderline personality disorder

STI: Sexually Transmitted Infection (Gonorrhea, chlamydia, syphilis)

Table 2: Risk of HIV among PrEP users by trajectory group, using IPTW (N=23,327)

PrEP Trajectories	Nonadherent (n= 6146, 26.3%)	Rapidly declining (n= 3807, 16.3%)	Gradually declining (n= 4834, 20.7%)	Consistently adherent (n=8540, 36.6%)
Crude Incidence per 10,000 person-years	81.9	47.3	49.9	51.7
Mean Follow-up, days	355.5	385.3	424.6	388.3
Unadjusted Hazard Ratio (95% C.I.)	1.59 (1.07-2.38)	0.92 (0.54-1.56)	0.96 (0.60-1.54)	Reference
Adjusted Hazard Ratio (95% C.I.)	1.63 (1.10-2.43)	1.03 (0.62-1.72)	1.04 (0.66-1.66)	Reference

Figure 1: Adherence trajectories of PrEP use over 720 days after index date (N= 23,327)



Discussion

- <40% of PrEP users are consistently adherent in the first 2 years of initiation
- PrEP users in the nonadherent trajectory group had over a 50% higher risk of HIV compared to the consistently adherent group.
- Limitations: The database did not have race data and is only generalizable to commercially insured PrEP users.
- Strength: First study applying GBTM to large commercial claims database

Conclusions

Public health efforts centered on adherence are needed to ensure PrEP users are protected from HIV, and to achieve the long-term goal of HIV eradication

Citations

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Disclosure:

Authors have no conflict of interest to report..

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