Identifying heavily treatment-experienced patients in a large administrative claims database

MOPEB236

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Introduction:

- A subset of people living with HIV (PLHIV) are heavily treatment-experienced (HTE) and have limited remaining antiretroviral therapy (ART) options due to resistance, intolerance, and potential interactions with concomitant medications.
- In order to support and guide development of new therapies for these individuals, it is important to understand the epidemiology of HTE patients.
  - There is no standard definition of HTE, making identifying the HTE population challenging.
  - Large, representative real-world data sources offer the best opportunity for quantifying prevalence of HTE, but often lack complete information on resistance, adherence, tolerability, and potential interactions with non-ART medications. Definitions of HTE based primarily on prescription data should be explored in these settings.
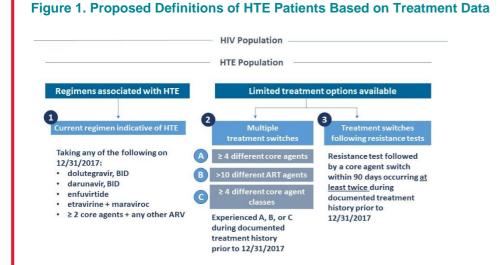
Objectives:

To describe prevalence and clinical characteristics of HTE patients according to multiple candidate HTE definitions in a real-world data source from the United States.

Methods:

Study Population and Statistical Analysis

- This study utilized linked longitudinal prescription claims (LRx) and professional fee claims (Dx) data from the IQVIA US Patient-Centric Data Warehouse.
- Inclusion criteria: HIV-1 positive patients ≥18 years of age with ≥1 office visit claim in the calendar year 2017.
- HTE patients were identified according to multiple definitions (Figure 1).
  - Three separate definitions based on a history of multiple treatment switches were evaluated (2A, 2B, 2C). Prevalence was reported separately for the components and overall (2A+2B+2C).

Figure 1. Proposed Definitions of HTE Patients Based on Treatment Data

- Point prevalence estimates (with 95% confidence intervals) were calculated as the proportion of patients meeting the criteria for HTE among all patients meeting the inclusion criteria as of December 31, 2017.
- Patient characteristics were described for each definition at baseline (first time meeting HTE criteria) and at end of study (December 31, 2017).
- Profiles of HTE populations selected by each candidate definition were compared to identify which definition, or combination of definitions, performed best identifying HTE patients in the study data source.

Results

- A total of 129,208 PLHIV met the inclusion criteria for this analysis and made up the denominator for all prevalence estimates.
- 14.6% (n=18,889) individuals met at least one candidate definition of HTE.

Figure 2. Prevalence of HTE among LRx+Dx Patients

	Prevalence (95% CI)	n
① Regimen indicative of HTE	3.7% (3.6%-3.8%)	4,757
② Multiple treatment switches (A, B, or C)	8.5% (8.3%-8.6%)	10,964
A. ≥4 different core agents	8.3% (8.1%-8.4%)	10,684
B. ≥10 different ART agents	0.9% (0.9%-1.0%)	1,184
C. ≥4 different core agent classes	3.0% (2.9%-3.1%)	3,877
③ Treatment switches following resistance tests	6.0% (5.8%-6.1%)	7,703

- Nearly all (97%) patients included in Def 2 (Multiple Treatment Switches) had experienced at least 4 separate core agents (Def 2A). A subset (34%) of these patients had also experienced 4 separate classes of core agents (Def 2C). Only 11% of those in Def 2A had also experienced ≥10 different ART agents (Def 2B).

Figure 3. Overlap of HTE definitions among LRx+Dx HIV+ Patients

- Overlap of patients identified as HTE between definitions was minimal.
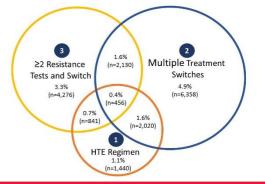- Only 0.4% of patients met all three definitions of HTE.

Table 1. Baseline* Demographic and Clinical Characteristics of HTE Patients Identified by Various Definitions

	① Current regimen indicative of HTE n=4,757	② Multiple treatment switches n=10,964	③ Treatment switches following resistance tests n=7,703
Demographics			
Age, median years (IQR)	55 (48, 61)	54 (46, 60)	51 (41, 58)
Female (n, %)	1,319 (27.7)	3,883 (35.4)	2,567 (33.3)
Payer type[†] (n,%)			
Medicaid	332 (7.0)	838 (7.6)	751 (9.7)
Medicare	1,990 (41.8)	4,213 (38.4)	1,716 (22.3)
Commercial	2,392 (50.3)	5,726 (52.2)	5,141 (66.7)
Clinical Characteristics			
Years since 1st HIV claim, median (IQR)	8.8 (5.3, 11.0)	9.8 (7.5, 11.1)	7.5 (5.0, 9.7)
Prior treatment switches, median (IQR)	5.0 (2.0, 11.0)	3.0 (2.0, 5.0)	3.0 (2.0, 5.0)
Years on baseline regimen, median (IQR)	0.4 (0.2, 0.9)	0.5 (0.2, 1.4)	0.5 (0.2, 1.1)
Baseline regimen with ≥2 core agents (n, %)	4,242 (89.2)	7,075 (64.5)	2,250 (29.2)
Comorbidities[‡] (n, %)			
Cardiovascular Disorders	2,103 (44.2)	3,801 (34.7)	2,298 (29.8)
Diabetes	1,435 (30.2)	2,594 (23.7)	1,480 (19.2)
Hepatic Disorders	861 (18.1)	1,499 (13.7)	1,160 (15.1)
Hypertension	2,987 (62.8)	5,574 (50.8)	3,648 (47.4)
Peripheral neuropathy	1,811 (38.1)	2,952 (26.9)	1,685 (21.9)
Kidney Disorders	2,388 (50.2)	4,207 (38.4)	2,867 (37.2)
Major Depressive Disorders	1,110 (23.3)	1,780 (16.2)	1,571 (20.4)
Anxiety	1,288 (27.1)	2,477 (22.6)	1,890 (24.5)
Non-ART medications[‡] (n, %)			
Antidepressants	2,689 (56.5)	6,453 (58.9)	1,187 (15.4)
Cardiac medications	2,218 (46.6)	4,353 (39.7)	727 (9.4)
Direct acting antivirals for HCV	145 (3.0)	154 (1.4)	38 (0.5)
Lipid lowering agents	2,472 (52.0)	4,599 (41.9)	755 (9.8)
Oral antidiabetics	941 (19.8)	1,806 (16.5)	272 (3.5)
Proton pump inhibitors	2,147 (45.1)	4,681 (42.7)	876 (11.4)

* Baseline characteristics evaluated when patients first met a specific definition of HTE (based on prescription date); † patients with only cash or unknown payer type not described; ‡ Based on relevant diagnostic codes and prescription claims occurring between first claim in database and baseline

Discussion

- Prevalence of HTE was variable across definitions, but all estimates suggest that HTE patients make up a small sub-set of the general HIV population in the United States.
  - Comorbidities and concomitant medications were common for all definitions.
- Assessing the performance of each candidate definition:
  - Treatment experience should be evaluated based on prior core agent class exposure (Def 2C). Simply evaluating total ART agents (Def 2B) or total core agents (Def 2A) allows for switching within class, which can occur due to reasons other than virologic failure or tolerability.
  - Without resistance test results and viral load data to confirm virologic failures, definition 3 overestimates true regimen switching due to resistance.
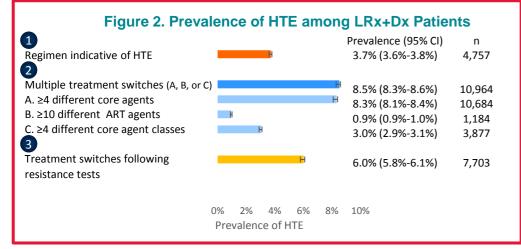 - Patients identified as HTE according current treatment (Def 1) and ≥4 core agent class exposures (Def 2C) are the most likely correctly classified as HTE.
  - The limitation of definitions 1 and 2C is that some HTE patients may be missed. Definition 1 will not capture all of the highly variable ART regimens given to HTE patients. Patients meeting definition 2C may be misclassified as non-HTE due to incomplete treatment history in the claims data source.
    - These limitations contribute to the lack of overlap observed between definitions.
- A composite definition that includes individuals currently taking an HTE regimen (Def 1) or with a treatment history of ≥4 core agent classes (Def 2C) optimizes identification of correctly classified HTE patients who may be missed by individual components of the definition. 6.0% of patients were classified as HTE according to this composite definition .
  - This prevalence estimate is comparable to what has been observed in other US cohorts.[1]

Conclusions:

Minimal overlap of patients identified as HTE by different candidate definitions in a large claims database suggests a composite definition of HTE that considers both current and past treatment may be required to more accurately capture this complex and varied patient population. Applying this composite definition in the LRx+Dx database resulted in an HTE prevalence of 6.0%.

References:
1. Hsu R, Henegar C, Fusco J, et al. (2018). Identifying heavily treatment-experienced patients in the OPERA Cohort, Presented at AIDS 2018, Amsterdam, the Netherlands, 23-27 July 2018.