Discussion

- HIV sequence data reporting was new for many jurisdictions in 2014 and reporting increased overall from 2013–2016. Since 2014, many other jurisdictions have begun HIV sequence collection.
- Less than half of HIV diagnoses from 2013–2016 in these 23 jurisdictions had a reported drug resistance test performed 3–5 months from HIV diagnosis, and an increasing proportion of cases had and IN sequence reported. Drug resistance testing for PR/RT mutations is needed to detect TDRMs for nRTIs, which remain a clinical/behavioral for ART.
- INSTI TDRM prevalence was low overall, but increased during a period when INSTI use and IN sequence reporting also increased. This indicates a need for ongoing population-level monitoring and additional analysis to identify those most at risk for INSTI TDRM.

Limitations

- TDRM prevalence in this analysis might differ from prevalence among all U.S. cases since we included only 23 U.S. jurisdictions and could not include undiagnosed cases or cases with no drug resistance test ordered, performed, or reported to NHSS.
- Cases in the analysis were assumed to be ART-naive if no evidence of prior ART use was found during case investigation; some cases might have been incorrectly classified as ART-naive. However, sequences were only included if they were performed within 3 months of diagnosis.
- HIV sequence results from conventional bulk sequencing underestimate the prevalence of drug resistance mutations.

References

1. R. Paul McClung, MD
2. U.S. Public Health Service
3. U.S. Public Health Service

Objectives & Methods

Objective 1: Characterize HIV Sequence Reporting to NHSS

Characterizing reporting of PR/RT and IN sequence data to NHSS from drug resistance tests performed within 5 months of HIV diagnosis for people diagnosed with HIV from 2013–2016.

Objective 2: Characterize TDRMs

Analyze HIV sequence generated by routine drug resistance testing to detect TDRMs for the following drug classes:

- Nucleoside reverse transcriptase inhibitors (nRTI)
- Non-nucleoside reverse transcriptase inhibitors (NNRTI)
- Protease inhibitors (PI)
- Integrase strand transfer inhibitors (INSTI)

Definitions:

- TDRM: HIV mutation detected by a drug resistance test performed within 3 months of HIV diagnosis in a person with no evidence of prior ART use.
- INSTI: A drug class that went into clinical use after the 2010–2011 NHSS report.

Sequences included:

- All PR/RT and IN sequences reported to NHSS.
- Fewer than 300 sequences reported to NHSS December 31, 2017.

Analysis:

- Descriptive analysis across all U.S. cases including 23 U.S. jurisdictions.
- Additional analysis to identify those most at risk for INSTI TDRMs.

Results

- No difference in prevalence by:
  - sex, race/ethnicity, age group, or transmission risk

- Higher prevalence:
  - Metropolitan Areas (33.5%) for nRTI
  - Midwest Region (13.5%) for NNRTI
  - Northeast Region (13.2%) for INSTI

- Lower prevalence:
  - Age ≥60 (7.3%)
  - Women (2012–2014) (3.7%)

- Any TDRM prevalence:
  - Black/African Americans (19.1%)
  - Hispanics/Latinos (19.1%)

- All PR/RT (10.3%)
  - Black/African Americans (11.9%), age ≥30 (10.8%), and NHSS-refined MA (9.8%)

- PR/RT results (34.5%)
  - Black/African Americans (22.6%), Hispanic/Latino (17.8%), and NHSS-refined MA (12.2%)

- Common Mutations
  - Metabol Blockers (W/D): 1,248 (4.6%)
  - IN: 4,103 (11.9%)

- TDRM Trends
  - PR/RT: 2,347 (50.8%)
  - INSTI: 1,248 (26.6%)

- TDRM Prevalence by Drug Class, 2013–2016

- IN Results (N=5,579)
  - 42 (0.8%) TDRMs

- U.S. Jurisdictions Included in Analysis (N=23)

- 40,083 Total Unique Sequences Analyzed (IN + PR/RT)

- 6,880 (19.0%) with at least 1 TDRM

- 40,083 Total Unique Sequences Analyzed (IN + PR/RT)

- 6,880 (19.0%) with at least 1 TDRM

- Sequence

- Drug class

- INSTI

- Non-RT

- IN

- PR/RT

- TDRM Trends

- Any TDRM

- Higher prevalence:
  - Black/African Americans (19.1%)

- Lower prevalence:
  - Age ≥60 (7.3%)

- Age at diagnosis, race/ethnicity, HIV transmission risk, metropolitan area, and US region.