LOW PREVALENCE OF HIV DRUG RESISTANCE WITH MODERN AGENTS

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Conclusions

❖ In our cohort, the prevalence of drug resistance has declined in the last decade.
❖ Resistance prevalence is very low for patients who initiated antiretroviral therapy in the modern treatment era.
❖ Little resistance to INSTI agents has emerged.
❖ Prevalence of resistance in viremic patients is consistently higher than overall.
❖ Next steps: improve imputation by including relevant variables such as exposure to ART, examine levels of drug-specific resistance in each class (low, intermediate, high)

Introduction

❖ Resistance limits the impact of potent combination therapy.
❖ The prevalence and pattern of HIV resistance in the population evolves with the introduction of new medications.
❖ We estimated the annual prevalence of cumulative HIV drug resistance by drug class in a clinical cohort in Southeastern US.
Methods

Study population

- ART-experienced patients in care at UNC 2000-2015
- In care defined as at least one HIV RNA VL

Analysis

- For each year and drug class, we estimated:

\[
\text{Overall prevalence} = \frac{\# \text{ with resistance}}{\# \text{ in care}}
\]

\[
\text{Prevalence in viremic patients} = \frac{\# \text{ with resistance}}{\# \text{ in care with any VL} \geq 1000}
\]

- Cumulative resistance: \(\geq 1\) major mutation, by class
- Patients with HIV VL\(<1000\): assume no new mutations
- Patients with HIV VL\(\geq 1000\): use new genotype or impute
- Multiple imputation based on age, sex, race, HIV risk factor, proximal CD4 cell count, proximal HIV RNA, and initial ART.
- Time trends were tested using linear regression
- Subgroup analysis: patients in care in 2015, ART start after 07
### Table 1. Characteristics of patients

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total sample N=3681</th>
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<tbody>
<tr>
<td><strong>Sexual risk factor, N (%)</strong></td>
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<tr>
<td>MSM</td>
<td>1521 (41%)</td>
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<tr>
<td>Heterosexual male</td>
<td>1085 (29%)</td>
</tr>
<tr>
<td>Female</td>
<td>1075 (29%)</td>
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<tr>
<td><strong>Race/ethnicity, N (%)</strong></td>
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<tr>
<td>African-American, non-Hispanic</td>
<td>2201 (60%)</td>
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<tr>
<td>White, non-Hispanic</td>
<td>1145 (31%)</td>
</tr>
<tr>
<td>Hispanic or other</td>
<td>335 (9%)</td>
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<tr>
<td><strong>Year of ART initiation, median (IQR)</strong></td>
<td>2001 (1996, 2007)</td>
</tr>
<tr>
<td><strong>Initial ART regimen, N (%)</strong></td>
<td></td>
</tr>
<tr>
<td>NRTI-only</td>
<td>1212 (33%)</td>
</tr>
<tr>
<td>PI</td>
<td>1027 (28%)</td>
</tr>
<tr>
<td>NNRTI</td>
<td>1021 (28%)</td>
</tr>
<tr>
<td>INSTI</td>
<td>248 (7%)</td>
</tr>
<tr>
<td>Other</td>
<td>173 (5%)</td>
</tr>
<tr>
<td><strong>Age at ART, median years (IQR)</strong></td>
<td>35 (29, 43)</td>
</tr>
<tr>
<td><strong>CD4 at ART, median cells/mm³ (IQR)</strong></td>
<td>270 (99, 437)</td>
</tr>
<tr>
<td><strong>VL at ART, median log10 copies/mL (IQR)</strong></td>
<td>4.7 (4.1, 5.3)</td>
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Results

Resistance **time trends** (Figure 1):

- NRTI, NNRTI, any drug class, and 2 or more class resistance increased between 2000 and 2005 and subsequently decreased (all p<0.05)

- PI, 3 or more class resistance remained stable between 2000 and 2005 (p=0.34 and 0.13, respectively) but decreased in the following years (both p<0.01)

- INSTI resistance increased slightly between 2009 and 2015 (p<0.01)

Among 685 patients initiating **ART 2007-2015** and still in care in 2015, we observed the following resistance profile in 2015:

- any class: 21% (95% CI 17%, 24%)
- NNRTI: 17% (14%, 20%)
- NRTI: 6% (4%, 8%)
- PI: 2% (1%, 4%)
- INSTI 1% (0%, 2%)
- 2 or more classes: 5% (3%, 7%)
- 3 or more classes: 1% (0%, 2%)
Figure 1. Prevalence of resistance among patients in care by calendar year.

Figure 2. Prevalence of resistance among patients with virologic failure by calendar year.

Figure 3. Ingress (A) and Egress (B) of patients in analysis by year.
Death: patients who die within a year before returning to care.
LTFU: patients not in care in any subsequent year.
*2014 LTFU not shown, unstable estimate because of shorter time