The Association Between Antiretroviral (ARV) Medication Adherence and Composite Medication Adherence for Non-HIV Chronic Conditions in People with HIV

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Background

- People living with HIV 50+ years of age are at increased risk of developing chronic conditions.\(^1\)

- Polypharmacy contributes to medication nonadherence, negatively affects health care outcomes, leading to increased health-system costs and decrements in overall population health.\(^2\)

- Polypharmacy has been associated with discontinuous ARV treatment.\(^3\)

- Studies of people with HIV with chronic comorbidities have reported that only 38.7-42.9% of patients achieved the ARV treatment adherence quality standard of ≥90% during one year of follow-up.\(^4,5\)
Objective

• The added burden of comorbid conditions associated with aging likely detracts from the target medication adherence goals for ARV medication adherence.

• **Therefore**, we evaluated the association between ARV medication adherence and non-ARV composite medication adherence (CMA) for three non-HIV chronic conditions in people with HIV.
Methods

Design:
- 37-month longitudinal observational cohort study 9/2018 – 9/2021
- 6-month pre-observational period included for eligibility determination
- 22,126 observation months

Sample:
- 598 adult people with HIV and type 2 diabetes, hypertension, and/or hypercholesterolemia
- Continuously enrolled in a US mid-Atlantic integrated health system
- Dispensed qualifying medications in pre-observational and observational periods
- **Exclusions:** Cumulative institutional stays exceeding seven days in the pre- and post-3/2020 observational periods; diagnosis of end stage renal disease pre-3/2020*; death; or incomplete demographic information (n=2)

*Note: 3 incident cases of ESRD were identified between 11/2020 and 3/2021, but were retained since they did not affect results interpretation.
Methods

Measurements:

• Demographics
  – age, race/ethnicity, insurance type, comorbidities, COVID-19 interruption date

• Monthly proportion of days covered (PDC) was used to estimate both ARV medication adherence and non-ARV CMA
  – non-ARV CMA included diabetes (T2DM), renin-angiotensin system antagonist (RASA), and statin medications during the observation period.
  – PDC is a consistent measure with CMS and health care quality organization standards.6-8

• Adequate medication adherence thresholds for observation month:
  – PDC ≥ 0.80 for non-ARV CMA
  – PDC ≥ 0.90 for ARV medication adherence
Methods

Analyses:

• Univariate analyses used to describe the cohort characteristics.

• Bivariate cross-tabulation for observed months with adequate medication adherence between ARV medication adherence and non-ARV CMA.

• Multivariable logistic regression using the generalized estimating equations approach was used to evaluate the association between ARV medication adherence and non-ARV CMA over the 37-month observational period.
Results

• A majority of the study cohort (n=598) was...
  – 51-64 years old (58%) and 65+ years old (19%)
  – Black (74%)
  – Male (69%)
  – Commercially insured (67%)

• In addition to HIV:
  – 62% of people with HIV had one of the 3 comorbidities
  – 30% had two comorbidities
  – 9% had three comorbidities

• Common non-ARV medication classes:
  – Statins (68%), RASA (55%), and T2DM (23%)

• Adequate medication adherence
  – ARV ≥90%: 76% of observed months
  – non-ARV CMA ≥80%: 71% of observed months
## Results

For the 16,769 observational months with adequate ARV Medication Adherence, 78% of those months also had adequate non-ARV CMA.

<table>
<thead>
<tr>
<th>ARV Medication Adherence ≥ 90%</th>
<th>non-ARV Composite Medication Adherence ≥ 80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2,681 (50%)</td>
<td>2,676 (50%)</td>
</tr>
<tr>
<td>5,357 (100%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>3,693 (22%)</td>
<td>13,076 (78%)</td>
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<tr>
<td>16,769 (100%)</td>
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</tr>
<tr>
<td>Total</td>
<td>Total</td>
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<tr>
<td>6,374 (29%)</td>
<td>15,752 (71%)</td>
</tr>
<tr>
<td>22,126 (100%)</td>
<td></td>
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</tbody>
</table>
For the 15,752 observational months with adequate non-ARV CMA, 83% of those months also had adequate ARV Medication Adherence.

<table>
<thead>
<tr>
<th>ARV Medication Adherence ≥ 90%</th>
<th>No</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2,681 (42%)</td>
<td>2,676 (17%)</td>
<td>5,357 (24%)</td>
</tr>
<tr>
<td>Yes</td>
<td>3,693 (58%)</td>
<td>13,076 (83%)</td>
<td>16,769 (76%)</td>
</tr>
<tr>
<td>Total</td>
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<td>15,752 (100%)</td>
<td>22,126 (100%)</td>
</tr>
</tbody>
</table>
Results

Positive association with adequate non-ARV CMA:

- **Adequate ARV medication adherence**
  - \( \text{aOR}=2.34, \ p<0.001, \ \text{ref: inadequate} \)
- **Period 3/2020-9/2021**
  - \( \text{aOR}=1.12, \ p=0.028, \ \text{ref: pre-3/2020} \)
- **Ages 51-64y**
  - \( \text{aOR}=1.22, \ p=0.035, \ \text{ref: 18-50y} \)
- **Medicare enrollment**
  - \( \text{aOR}=1.59, \ p<0.001, \ \text{ref: commercial} \)

Inverse association with adequate non-ARV CMA:

- **Black race**
  - \( \text{aOR}=0.55, \ p<0.001, \ \text{ref: white} \)
- **Medicaid enrollment**
  - \( \text{aOR}=0.55, \ p=0.002, \ \text{ref: commercial} \)
- **Taking medications:**
  - For 2 non-HIV chronic conditions,
    \( \text{aOR}=0.80, \ p=0.011, \ \text{ref: 1} \)
  - For 3 non-HIV chronic conditions,
    \( \text{aOR}=0.74, \ p=0.029, \ \text{ref: 1} \)
Limitations / Strengths

- Observational design and small sample
- Analysis of historical (secondary) data
- Applying a surrogate measure of adherence
  - Actual adherence not measured
- No clinical outcome assessment
- Potential development of other conditions that may influence adherence

- Long duration of study – 37 months
- Innovative measure of composite medication adherence
- Raises awareness and reinforces the importance of considering the total care of people with HIV\textsuperscript{9,10}
- Identifies opportunities for improving care coordination in people with HIV
Conclusions

• Despite positive association between ARV medication adherence and CMA, there is a considerable proportion of months when adequate ARV medication adherence and non-ARV CMA are discordant.

• ARV medication adherence may not reliably indicate adequate non-ARV CMA for non-HIV chronic conditions and vice versa.
  – Adequate non-ARV CMA may more reliably predict adequate ARV adherence than adequate ARV predicting non-ARV CMA.

• It is important for both HIV and primary care providers to be aware and reinforce medication adherence across total care for people with HIV.
  – Findings reinforce the need and potential role for adherence coordinators / navigators to assist in optimizing care.
Questions?

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