The incidence and severity of drug interactions before and after antiretroviral therapy simplification in treatment experienced patients with HIV Infection

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Background

• More than 70% of the HIV population will be above the age of 50 by the year 2020
• Most are receiving 5 or more medications for common chronic conditions plus their antiretroviral therapy (ART)\(^1\)
• Simplifying ART can improve patient adherence and quality of life\(^2\)
• Limited evidence exists on ART simplification and drug interactions

Purpose

• The primary objective of this study was to assess changes in the incidence and severity of drug interactions before and after ART simplification in treatment experienced patients.
• Describe ART medication class changes and analyze predictors for achieving drug interaction score reductions.

Methods

• Observational, retrospective cohort study of patients on ART for HIV infection at a single urban center
• Adults receiving at least 1 concomitant medication and undergoing ART simplification between 6/2014 and 5/2018 were evaluated
• ART regimens pre- and post-simplification were assessed for drug interactions using the University of Liverpool's HIV drug-interaction checker (ULHDIC)
• Scores were generated based on the ULHDIC classification for interaction potential and total drug interaction scores for each patient pre- and post-simplification were calculated
• The average pre-simplification and post-simplification scores were determined and analyzed using a paired t-test
• Predictors for achieving drug interaction score reductions were examined using a multivariable linear regression model

Results

Table 2. Baseline characteristics of patients pre-simplification

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total (n = 99)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (IQR) - years</td>
<td>54 (49-61)</td>
</tr>
<tr>
<td>Male sex - no. (%)</td>
<td>78 (79)</td>
</tr>
<tr>
<td>Race - no. (%)</td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td>54 (55)</td>
</tr>
<tr>
<td>White or Caucasian</td>
<td>38 (38)</td>
</tr>
<tr>
<td>Median duration of infection (IQR) - years</td>
<td>16 (9-22)</td>
</tr>
<tr>
<td>Median duration of ART (IQR) - years</td>
<td>10 (5-16)</td>
</tr>
<tr>
<td>Median CD4+ cell count (IQR) - cells/mm(^3)</td>
<td>516 (374-737)</td>
</tr>
<tr>
<td>HIV-1 RNA &lt; 50 copies/mL - no. (%)</td>
<td>81 (82)</td>
</tr>
<tr>
<td>Median number of concomitant medications (IQR)</td>
<td>4 (2-6)</td>
</tr>
</tbody>
</table>

Table 3. Pre- and post-simplification medication changes

<table>
<thead>
<tr>
<th></th>
<th>Pre-Switch</th>
<th>Post-Switch</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean interaction score</td>
<td>3.67</td>
<td>2.24</td>
<td>-1.44*</td>
</tr>
<tr>
<td>Switching off PI</td>
<td>3.88</td>
<td>1.25</td>
<td>-2.63</td>
</tr>
<tr>
<td>Switching to an INSTI</td>
<td>3.79</td>
<td>2.31</td>
<td>-1.47</td>
</tr>
<tr>
<td>Average # ART pills/day</td>
<td>3.65</td>
<td>1.52</td>
<td>-2.13</td>
</tr>
</tbody>
</table>

Figure 1. ART Pre- and Post Simplification

Table 4. Multivariable linear regression model: Predictors for achieving score reductions with ART simplification

<table>
<thead>
<tr>
<th>Factor</th>
<th>Predicted Score Change</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concomitant medications*</td>
<td>-1.03 (CI(_{95}) 1.01-1.05)</td>
<td>.004</td>
</tr>
<tr>
<td>Discontinuing a protease inhibitor</td>
<td>-1.47 (CI(_{95}) 1.26-1.71)</td>
<td>.0001</td>
</tr>
<tr>
<td>Switching to bictegravir or dolutegravir</td>
<td>-1.27 (CI(_{95}) 1.09-1.48)</td>
<td>.003</td>
</tr>
</tbody>
</table>

*Score change is predicted per concomitant medication

Conclusion

• ART simplification decreased the incidence and severity of drug-drug interactions in persons living with HIV (PLWH)
• Simplification led to lower pill burdens consistent with previous studies, which may improve treatment convenience and adherence
• Although there was an overall decrease in drug interaction scores post-simplification, interactions emerged indicating the continued importance of ART drug interaction monitoring
• Future studies can be directed toward analyzing which drug interactions commonly arise for patients taking simplified ART

Limitations

• Subjects were primarily male (79%)
• Accuracy of the data relied on completeness of the medical record
• Single centered study could limit the external validity of the results
• Clinical significance of interactions is not reflected in the drug interaction score

References