Antiretroviral Refill Adherence is an Early Predictor of Retention in HIV Care

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Disclosure

• Pfizer
  – DSMB member for trial of drug unrelated to HIV
  – During time of these studies
  – Ongoing
Introduction

• “Drugs don’t work in people who don’t take them” - Koop
  – Non-adherence is normal behavior
  – Perfect adherence is unrealistic

• Non-retention is a related construct
  – Prevents renewal of Rx
  – Decreased salience of therapy (?)
  – Decreased access to preventive care
  – Decreased effect of provider on behavior
Hypothesis

• Can detection of non-adherence identify risk for non-retention?
  – Pharmacy records valid measure of adherence
  – Monthly refills = frequent monitoring
  – Tracking possible despite absence of patient
Study Design

• Retrospective cohort study

• Site
  – Jonathan Lax Center, urban Philadelphia site

• Population
  – HIV infected adults prescribed ARVs
  – ≥2 clinic visits ≥4 weeks apart
  – One visit after 5/2012 and another visit scheduled after 10/2012
  – Refills obtained via Walgreens (340B)
  – Exclude: automated refills
Variables Measured

• Primary outcome
  – ‘No show’ to index visit
  – Index visit: randomly selected scheduled visit after 10/2012
  – ‘No show’ = no call to reschedule
  – If rescheduled, another visit selected

• Primary exposure
  – Refill adherence (MPR) calculated every month over time of study
Analysis Plan

- Summarize adherence every month back from index date
- Compare adherence between ‘shows’ and ‘no shows’
  - Over entire interval
  - Over most recent time points
- Discriminative ability of adherence for ‘no show’
  - Area under ROC curve
  - Sensitivity/specificity for ‘no show’
Time to 3 refills (2 months)

First fill  Second fill  Third fill

First interval  Second interval

Adherence metric: $\Sigma$ intervals/(3$^{rd}$ fill date-1$^{st}$ fill date)

Missing refills imputed to occur on index date and enrollment date, as needed

Adherence conceptualized as either % doses taken or # days late for refill
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>‘Show’ n=285</th>
<th>‘No Show’ n=108</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (IQR)</td>
<td>49 (42-53)</td>
<td>47 (38-52)</td>
<td>0.04</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>202 (71%)</td>
<td>70 (65%)</td>
<td>&gt;0.5</td>
</tr>
<tr>
<td>Female</td>
<td>81 (28%)</td>
<td>37 (34%)</td>
<td></td>
</tr>
<tr>
<td>Transgender</td>
<td>2 (1%)</td>
<td>1 (1%)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>0.033</td>
</tr>
<tr>
<td>Black</td>
<td>171 (60%)</td>
<td>77 (71%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>103 (36%)</td>
<td>25 (23%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>9 (3%)</td>
<td>6 (6%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>24 (9%)</td>
<td>8 (7%)</td>
<td>&gt;0.5</td>
</tr>
<tr>
<td>Prior AIDS Dx</td>
<td>145 (51%)</td>
<td>62 (57%)</td>
<td>0.13</td>
</tr>
<tr>
<td>MSM</td>
<td>146 (52%)</td>
<td>45 (42%)</td>
<td>0.08</td>
</tr>
<tr>
<td>IDU</td>
<td>49 (17%)</td>
<td>28 (26%)</td>
<td>0.09</td>
</tr>
</tbody>
</table>
Adherence Differences

• Overall effect
  – 9.3% (95% CI: 12.3-5.7%) more doses by ‘shows’ than ‘no shows’, p<0.001

• Limiting to most recent interval
  – ‘Shows’ 93.8% (66.7% - 107.1%) vs. ‘No shows’ 80% (53.6% - 107.1%), p<0.005
Time from last refill to index date compared between 'show' and 'no show' groups

Median(IQR) of days: 13(6-25) for 'Show', 24(13-36) for 'No Show', p-value=0.0003
Discriminative Ability

- Area under ROC curve
  - ~0.6 (perfect=1.0, flip of a coin=0.5)
- Sensitivity/specificity poor
Conclusions

• Non-adherence is associated with ‘no show’ to clinic
  – No clear threshold amount of adherence predicts ‘no show’

• Incomplete overlap suggests related but distinct phenomena
  – Caution required for contacting patients with suboptimal adherence
  – May not be at high risk of ‘no show’
  – Yet allows for more adherence conversation
Thanks to the study participants!