HIV Stigma and Viral Load are Mediated by Depression and Antiretroviral Adherence in a Cohort of US Patients in Care

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Disclosures

• I have received investigator-initiated grant support from Gilead Sciences for a study unrelated to the work presented
Background

• HIV-related stigmas exert a profound influence on quality of life and mental health for people living with HIV (PLWH)

• Increasing evidence that HIV stigma has deleterious effects on HIV care and treatment engagement

• Important advances in conceptual frameworks delineating the mechanisms through which HIV stigma may impact HIV health outcomes

Katz et. al. JIAS 2013, Rueda BMJ Open 2016
Conceptual Framework

Turan et. al. AJPH 2017
Background

• Existing literature on internalized HIV stigma and virologic suppression in the US is scant and demonstrates mixed results

• Far more research with self-reported antiretroviral adherence as the outcome

• In general, studies limited by small numbers, singles sites, and single genders; mediation analyses frequently cross-sectional

Turan et. al. AIDS, 2019, Kemp et. al AIDS 2019, Lipira et. al. AIDS Behav 2018, Helms et. al. AIDS Behav 2016, Baugher AIDS Behav 2017
CFAR Network of Integrated Clinical Systems (CNICS)

- Observational cohort
  - electronic medical record data
  - patient reported outcomes (PROs)
  - specimens

- PROs self-reported in clinic on average every 4-6 months (minimum window of 105 days)
Study Rationale/Objective

• Significant cross-sectional association between internalized HIV stigma and concurrent viremia in CNICS (AOR 1.13, 95% CI 1.02 to 1.25, p = 0.02)

• Research Question: Do depression and antiretroviral adherence sequentially mediate the association of internalized HIV stigma and detectable viral load?

Christopoulos et. al. CROI 2018 and in press, JAIDS
## Internalized Stigma Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Response scale</th>
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<tbody>
<tr>
<td>Having HIV makes me feel like a bad person.</td>
<td>1 = strongly disagree</td>
</tr>
<tr>
<td>I feel ashamed of myself for having HIV.</td>
<td>2 = disagree</td>
</tr>
<tr>
<td>I think less of myself because I have HIV.</td>
<td>3 = neutral</td>
</tr>
<tr>
<td>Having HIV is disgusting to me.</td>
<td>4 = agree</td>
</tr>
<tr>
<td></td>
<td>5 = strongly agree</td>
</tr>
</tbody>
</table>

Adapted from Earnshaw et. al. AIDS Behav 2013
Methods

- Internalized HIV stigma assessed at $T_0$ with a validated 4-item measure
- Depressive symptoms measured at $T_1$ using PHQ-9
- Adherence measured at $T_2$ using both VAS and self-rated ability to adhere, and dichotomized into optimal (100% on VAS and “excellent”) and less than optimal adherence
- Viral load measured at $T_3$ (dichotomized as $>$ or $\leq$ 200 copies/mL)
Methods

• Baysesian sequential mediation analysis in Mplus
• Covariates at $T_0$ were age, gender, race/ethnicity, sexual orientation, years in CNICS, and site
• Incomplete data points assumed to be conditionally missing at random (MAR)
• Sensitivity analysis performed using only those patients on ART at $T_2$
Results

• 5,795 patients underwent stigma assessment between 2/16 – 11/17
• Median age 49, 17% cis-women, 32% heterosexual, 39% Black, 15% Latino, 88% suppressed at baseline
• Cronbach’s $\alpha = 0.91$ for stigma and 0.87 for depressive symptoms
• Mean stigma score was 1.98 (SD 1.07)
• 17% had PHQ-9 score >10
• 35% reported sub-optimal adherence
• 10% had viral load >200 copies/mL
Results

Total stigma-VL effect (estimate = 0.055; 95%CI = 0.014, 0.097; standardized β = 0.100; SD= 0.038)
Indirect sequential association (estimate = 0.014; 95%CI = 0.005, 0.027; standardized β = 0.025; SD= 0.009)
Direct effect of stigma on VL (estimate = 0.028; 95%CI = -0.22, 0.081; standardized β = 0.051; SD= 0.048)

* Denotes significance at the 0.05 level
Summary of Results

• Significant total effect of stigma on HIV viral load
• Significant chained indirect effect
• Constituent indirect effects not significant
• Direct effect of stigma on HIV viral load not significant
• Sensitivity analysis limited only to those on ART at T₂ demonstrated similar results
Conclusions

• The effect of internalized HIV stigma on HIV viral load appears to be mediated by depressive symptoms and antiretroviral adherence

• Interventions to alleviate depressive symptoms resulting from internalized HIV stigma may help improve viral load outcomes
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