Perceived stress in pregnancy and postpartum of mothers living with HIV in Ontario, Canada

Allyson Ion¹, Dr. Saara Greene¹, Dr. Adriana Carvalhal²,³, Dr. Fiona Smaill⁴, Dr. Mark Yudin⁵, Dr. Mona Loutfy⁶ for the HIV Mothering Study Team

1 - School of Social Work, McMaster University
2 - Medical Psychiatry, St. Michael’s Hospital
3 - Department of Psychiatry, University of Toronto
4 - Department of Pathology and Molecular Medicine, McMaster University
5 - Obstetrics, Gynecology, & Reproductive Infectious Diseases, St. Michael’s Hospital
6 - Women’s College Research Institute, Women’s College Hospital

4th International Workshop on HIV & Women
January 13-14, 2014
Background

• Impending motherhood can be a stressful time for all women.

• Social determinants can challenge women’s mental health and experiences of motherhood (Benoit et al., 2007):
  • Younger age (McRobbie, 2000)
  • Lower socioeconomic status & living in poverty (Hobfoll et al., 1995; Hulszner & Cameron, 1995)
  • Non-resident immigration status & recent migration (DeSouza, 2006)

• Social determinants may exacerbate the experiences of mothers with HIV who also contend with structural, social and psychological complexities of living a chronic, stigmatizing illness.
Background

• Unique concerns of women living with HIV are documented in the literature:
  • Increased risk for depression and other psychosocial stressors (Ciesla & Roberts, 2001; Hartzell et al., 2008; Kelly, 1993; Rotheram-Borus et al., 1999; Schuster, 2000)
  • Mothers who perceive greater HIV-related stigma report higher levels of depression, health-related anxiety, number of illness symptoms and poorer functioning on medical outcomes
    • Driven by HIV-related stigma and negative self-esteem (Murphy et al., 2002)

• Motherhood intensifies concerns related to HIV disclosure, perinatal transmission, stigma and worry about effects of HIV on children (Sandelowski & Barroso, 2003).

• Motherhood effects sense of responsibility to care for oneself to be available to children (Sandelowski & Barroso, 2003).
HIV Mothering Study

- Observational, mixed methods, community-based study
- Goal: enhance understanding of the psychosocial experiences and needs of women living with HIV across Ontario in pregnancy and the first year of motherhood
- Data collection: 3rd trimester (Baseline), 3, 6 & 12 months pp
  - Scales: Perceived Stress Scale (PSS), Edinburgh Postnatal Depression Scale (EPDS), Berger HIV Stigma Scale
  - Medical record data extraction
  - Narrative interviews in pregnancy, 3 and 12 mo pp
- 77 pregnant women enrolled at HIV and obstetrical care centers from March 2011 to December 2012
- Community leadership: team of mothers living with HIV to advise research process, lead data collection/analysis
The Present Study

• Based on the literature, the HIV Mothering Study team hypothesized:
  • Stress in mothers living with HIV would increase from pregnancy to postpartum
  • Stress in mothers living with HIV would be related to symptoms of depression and HIV-related stigma

• This analysis describes levels and covariates of perceived stress in pregnancy and early postpartum of mothers living with HIV across Ontario.
Methods

• Sociodemographic, clinical and survey data were summarized in aggregate format and analyzed using medians and IQRs for continuous variables and frequencies and proportions for categorical variables.

• T test: change in perceived stress from pregnancy (n=69) to 3 mo pp (n=66)

• Generalized Estimating Equation (GEE) models:
  • Covariates of perceived stress in pregnancy (n=69) and 3 mo pp (n=62)
  • Useful statistical approach that accounts for unmeasured dependence between outcomes and allows for different numbers of observations within individuals
<table>
<thead>
<tr>
<th><strong>HIV Mothering Study Cohort Demographics (n=77)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td><strong>Median = 33, Range = 21-42</strong></td>
</tr>
</tbody>
</table>
| **Race** | **Black/African = 66.2%**  
**White = 24.7%**  
**Aboriginal = 5.2%**  
**S. Asian = 2.6%**  
**W. Asian/Arab = 1.3%** |
| **Place of Origin** | **Africa = 44 (57.1%)**  
**Canada/N. America = 25 (32.5%)**  
**S. America + Caribbean = 7 (9.1%)**  
**India/Asia = 1 (1.3%)** |
| **Relationship Status** | **Single = 25 (33%)**  
**Separated/Divorced = 7 (9%)**  
**Common-Law = 18 (23%)**  
**Married = 18 (23%)**  
**In a relationship, not living together = 9 (12%)** |
| **Years living with HIV** | **Median = 7, IQR 3.5 – 9.0** |
| **HIV diagnosis in current pregnancy** | **9 (12%)** |
| **First baby** | **21 (27.3%)** |
### HIV Mothering Study Cohort Demographics (n=77)

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of children</td>
<td>0 = 21 (27%)&lt;br&gt;1 = 22 (29%)&lt;br&gt;2 = 20 (26%)&lt;br&gt;3 = 7 (9%)&lt;br&gt;More than 3 = 7 (9%)</td>
</tr>
<tr>
<td>Children’s Aid Society (CAS) involvement</td>
<td>22 (29%)</td>
</tr>
<tr>
<td>*self-report in 3rd trimester</td>
<td></td>
</tr>
<tr>
<td>On HAART in 3rd trimester</td>
<td>98.7%</td>
</tr>
<tr>
<td>Absolute CD4 in 3rd trimester</td>
<td>Mean = 512, Range = 12 – 1090&lt;br&gt;6 women had CD4 ≤ 200 (7.8%)</td>
</tr>
<tr>
<td>Number of women with an undetectable viral load in 3rd trimester</td>
<td>62 (80.5%)&lt;br&gt;15 women did not (range: 45 - 22226 copies)</td>
</tr>
<tr>
<td>Prior HAART Use</td>
<td>54 (70%)</td>
</tr>
<tr>
<td>History of depression</td>
<td>24 (31.2%)</td>
</tr>
<tr>
<td>History of other psychiatric disorders</td>
<td>11 (15.9%) (out of 69)</td>
</tr>
<tr>
<td>Post-Traumatic Stress Disorder</td>
<td>4 (5.8%) (out of 69)</td>
</tr>
</tbody>
</table>
HIV Mothering Study Cohort Demographics (n=77)

| Immigration Status          | Canadian Citizen = 55.1%  
|                            | Permanent Resident = 27.5%  
|                            | Refugee = 8.7%              
|                            | Other = 8.6%                |
| Sexual Orientation          | Heterosexual/Straight = 98.6% |
| Education Completed         | Some High School = 23.2%    
|                            | High School = 18.8%         
|                            | College Diploma = 23.2%     
|                            | Incomplete University = 7.2% 
|                            | Completed University (U&G) = 14.4% |
| Main Source of Income       | Ontario Disability Support Program = 47.8%  
|                            | Ontario Works = 17.4%       
|                            | Full Time Employment = 13%  |
| Housing                     | 2 Bedroom Apartment = 30.4% 
|                            | House = 26.1%               
|                            | 1 Bedroom Apartment = 18.8% 
|                            | *all stably housed          |
Change in perceived stress from 3rd trimester to 3 months postpartum

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline (n=69)</th>
<th>3 Mo PP (n=66)</th>
<th>Difference, p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean PSS Score (SD)</td>
<td>24.9 (7.1)</td>
<td>22.5 (8.1)</td>
<td>-2.40, p=0.071</td>
</tr>
<tr>
<td>Median PSS Score (IQR)</td>
<td>24.0 (20.0, 30.0)</td>
<td>23.0 (17.0, 28.0)</td>
<td></td>
</tr>
</tbody>
</table>

- PSS measures the degree to which situations in one’s life are appraised as stressful.
- PSS validated with two samples of US college students and a community smoking-cessation program.
- The average Perceived Stress Scale score for the general female population is 24.96 (Cohen, Kamarck, & Mermelstein, 1983).
GEE Model #1: Covariates of perceived stress in pregnancy (Baseline PSS Score), n=71

<table>
<thead>
<tr>
<th>Variable</th>
<th>Exp (b)</th>
<th>Std. Err.</th>
<th>z</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>3.16</td>
<td>1.41</td>
<td>2.25</td>
<td>0.03</td>
</tr>
<tr>
<td>EPDS Score at Baseline</td>
<td>0.91</td>
<td>0.14</td>
<td>6.41</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Non-resident Immigration Status</td>
<td>1.33</td>
<td>1.67</td>
<td>0.8</td>
<td>0.43</td>
</tr>
<tr>
<td>Contact with a Children’s Aid Society (ever)</td>
<td>-0.85</td>
<td>1.71</td>
<td>-0.49</td>
<td>0.62</td>
</tr>
<tr>
<td>Number of Children at Baseline</td>
<td>0.17</td>
<td>0.5</td>
<td>0.34</td>
<td>0.74</td>
</tr>
<tr>
<td>Diagnosed with HIV In Current Pregnancy</td>
<td>-2.34</td>
<td>2.35</td>
<td>-1</td>
<td>0.32</td>
</tr>
<tr>
<td>First Baby</td>
<td>-0.93</td>
<td>1.74</td>
<td>-0.54</td>
<td>0.59</td>
</tr>
<tr>
<td>Years Living with HIV</td>
<td>-0.08</td>
<td>0.22</td>
<td>-0.34</td>
<td>0.73</td>
</tr>
<tr>
<td>Undetectable Plasma HIV Viral Load at Baseline</td>
<td>-2.6</td>
<td>1.64</td>
<td>-1.59</td>
<td>0.11</td>
</tr>
<tr>
<td>Absolute CD4 at Baseline</td>
<td>0</td>
<td>0</td>
<td>1.43</td>
<td>0.15</td>
</tr>
<tr>
<td>Clinical Diagnosis of Depression (ever)</td>
<td>0.92</td>
<td>1.39</td>
<td>0.66</td>
<td>0.51</td>
</tr>
<tr>
<td>Other psychiatric condition</td>
<td>0.44</td>
<td>1.85</td>
<td>0.24</td>
<td>0.81</td>
</tr>
<tr>
<td>Berger HIV Stigma Scale Score at Baseline</td>
<td>-0.03</td>
<td>0.03</td>
<td>-0.97</td>
<td>0.33</td>
</tr>
<tr>
<td>Everyday Discrimination Scale (Racism) Score at Baseline</td>
<td>-0.02</td>
<td>0.08</td>
<td>-0.27</td>
<td>0.79</td>
</tr>
<tr>
<td>_cons</td>
<td>17.69</td>
<td>3.87</td>
<td>4.57</td>
<td>0</td>
</tr>
</tbody>
</table>
## GEE Model #2: Covariates of perceived stress at 3 months postpartum, n=66

<table>
<thead>
<tr>
<th>Variable</th>
<th>Exp (b)</th>
<th>Std. Err.</th>
<th>z</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDS Score at 3 Months Postpartum</td>
<td>1.11</td>
<td>-0.13</td>
<td>8.58</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Number of Children at Baseline</td>
<td>0.85</td>
<td>-0.49</td>
<td>1.72</td>
<td>0.09</td>
</tr>
<tr>
<td>First Baby</td>
<td>3.31</td>
<td>-1.63</td>
<td>2.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Single</td>
<td>1.74</td>
<td>-1.36</td>
<td>1.28</td>
<td>0.2</td>
</tr>
<tr>
<td>Non-resident Immigration Status</td>
<td>2.55</td>
<td>-1.81</td>
<td>1.41</td>
<td>0.16</td>
</tr>
<tr>
<td>Contact with a Children’s Aid Society (ever)</td>
<td>-1.38</td>
<td>-1.69</td>
<td>-0.82</td>
<td>0.41</td>
</tr>
<tr>
<td>Clinical Diagnosis of Depression (ever)</td>
<td>1.23</td>
<td>-1.38</td>
<td>0.89</td>
<td>0.38</td>
</tr>
<tr>
<td>EPDS Score at Baseline</td>
<td>-0.23</td>
<td>-0.17</td>
<td>-1.34</td>
<td>0.18</td>
</tr>
<tr>
<td>Berger HIV Stigma Scale Score at Baseline</td>
<td>-0.02</td>
<td>-0.05</td>
<td>-0.47</td>
<td>0.64</td>
</tr>
<tr>
<td>Berger HIV Stigma Scale Score at 3 Mo PP</td>
<td>0.06</td>
<td>-0.04</td>
<td>1.29</td>
<td>0.2</td>
</tr>
<tr>
<td>_cons</td>
<td>6.4</td>
<td>-3.76</td>
<td>1.7</td>
<td>0.09</td>
</tr>
</tbody>
</table>
Conclusions

- Perceived stress scores decreased from pregnancy to 3 months postpartum (almost reaching statistical significance).
- HIV Mothering Study participants across Ontario do not demonstrate higher perceived stress scores in pregnancy and early postpartum compared to the general female population.
- It is important to consider women’s social and emotional context including factors that may exacerbate stress in pregnancy and after the baby’s arrival:
  - Symptoms of depression in pregnancy and postpartum irrespective of previous psychiatric diagnoses
  - Caring for multiple children
  - Relationship status
Relationship status

• 58% of participants were in a relationship
• Being single was an important covariate of perceived stress in pregnancy
• In qualitative interviews, partners were identified as an important source of emotional support
  • Partners were often the only person aware of the woman’s HIV status and became an important outlet to discuss HIV and impending motherhood
• Important opportunity to explore:
  • The nature of emotional and practical support partners provide to mothers with HIV
  • How mothers who are not in a relationship fulfill their support needs to mitigate causes of stress.
Promising improvements in Canada?

- Women with HIV across Canada are increasingly having children in the context of low (no) perinatal HIV transmission
  - Mental health literature published in late 1990s - early 2000s does not reflect the current reality of the psychosocial and service access improvements women are experiencing
  - Improved perceived stress and QoL after baby’s arrival (Pereira & Canavarro, 2012)

- Depression continues to be a barrier to effective perinatal HIV care for some women
  - Impacts adherence to HAART, especially in women with high parity (Kapetanovic et al., 2009)
  - Important to continue supporting women who express high levels of perceived stress in pregnancy and early postpartum contextualizing care in their identities and social circumstances.
Study limitations

- Limited sample size
  - Tried to engage women across many different HIV and obstetrical sites in Ontario
  - Challenging to engage some women after baby’s arrival
  - 2011: 101 infants born to HIV-positive women across Ontario (Remis & Liu, 2013)

- Perceived Stress Scale not validated in HIV cohort

- HIV-related stigma not significant in GEE modeling
  - Some participants had challenges responding to/interpreting questions if they had not disclosed to anyone

- Perceived stress may be a symptom of depression, i.e. reason for EPDS scores at baseline and 3 mo pp becoming predictors
  - Rationale for using GEE modeling
Next steps

- Review trends in perceived stress at 6 and 12 mo pp in HIV Mothering Study cohort
  - Does it continue to decrease over time?
  - Postpartum depression now assessed up to 6 months

- Mothering on the Margins (MOMs) Study (lead by Drs. Mark Yudin and Mona Loutfy):
  - Compare perceived stress and other mental health outcomes with HIV-negative mothers across Ontario (matched by sociodemographic characteristics)
  - Also conducting qualitative interviews to contextualize survey data
Acknowledgments

- The HIV Mothering Study team would like to thank:
  - Participants
  - Conference organizers
  - All clinical sites and research personnel
  - The Ontario HIV Treatment Network and the Canadian Institutes of Health Research (Funding)
Thank you on behalf of the team

Co-Principal Investigators:
Dr. Saara Greene
Dr. Mona Loutfy
Dr. Adriana Carvalhal

Co-Investigators:
Dr. Jonathan Angel
Dr. Ari Bitnun
Dr. Jason Brophy
Dr. Jeff Cohen
Dr. Greg Gamble
Dr. Kevin Gough
Dr. Andree Gruslin
Dr. Lydia Kapiriri
Dr. Charles Laporte
Dr. Hugues Loomba
Ms. Shari Margolese
Ms. Khatundi Masinde
Dr. Kellie Murphy
Dr. Jeff Powis

Dr. Corinna Quan
Dr. Janet Raboud
Dr. Anita Rachlis
Dr. Edward Ralph
Ms. Robyn Salter
Dr. Lindy Samson
Dr. Roger Sandre
Dr. Sandi Seigel
Dr. Mike Silverman
Dr. Fiona Smaill
Dr. Sharon Walmsley
Dr. Wendy Wobeser
Dr. Mark Yudin
Dr. Anne-Marie Zadjlik

Central Research Personnel:
Fatima Barry
Kerrigan Beaver
Janette Cousineau
Marisol Desbiens
Dawn Elston

Allyson Ion
Gladys Kwaramba
Kaitlyn Mellor
Stephanie Smith

Co-Principal Investigators:
Dr. Saara Greene
Dr. Mona Loutfy
Dr. Adriana Carvalhal

Co-Investigators:
Dr. Jonathan Angel
Dr. Ari Bitnun
Dr. Jason Brophy
Dr. Jeff Cohen
Dr. Greg Gamble
Dr. Kevin Gough
Dr. Andree Gruslin
Dr. Lydia Kapiriri
Dr. Charles Laporte
Dr. Hugues Loomba
Ms. Shari Margolese
Ms. Khatundi Masinde
Dr. Kellie Murphy
Dr. Jeff Powis

Dr. Corinna Quan
Dr. Janet Raboud
Dr. Anita Rachlis
Dr. Edward Ralph
Ms. Robyn Salter
Dr. Lindy Samson
Dr. Roger Sandre
Dr. Sandi Seigel
Dr. Mike Silverman
Dr. Fiona Smaill
Dr. Sharon Walmsley
Dr. Wendy Wobeser
Dr. Mark Yudin
Dr. Anne-Marie Zadjlik

Clinical Site Coordinators:
Cheryl Arneson
Jennifer Bowes
Gloria Crowl
Adri D’ Aquila
Leanne De Souza
Sharon Fair
Kim Foshay
Jenna Ekborn
Michele Ellis
Roberta Halpenny
Sheryl Hewko

Jennifer Lalonde
Judy Latendre-Paquette
Elaine Lefaive
Georgina MacDougall
Mary-Jean Martin
Nancy McFarland
Anja McNeil
Linda Moran
Isabelle Seguin
Danielle Tardiff
References


