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The prevalence and determinants of depression among HIV positive perinatal women receiving antiretroviral therapy in India.

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Summary

To assess the prevalence and correlates of perinatal depression, 200 HIV-positive pregnant/postpartum women receiving antiretroviral therapy (ART) were interviewed at eight government ART centers in four states across India. 52.5% (105) participants had depressive symptomatology (Edinburgh Postnatal Depression Scale score >13) while 23% of the participants reported thoughts of self-harm; there was no difference between pregnant and post-partum participants. Poor illness perception was associated with depression (AOR: 1.09, 95%CI: 1.05, 1.14); there was no association between adherence and depression in this population.

Keywords

HIV; depression; perinatal depression; antiretroviral therapy; illness perceptions; adherence to ART

Background

Perinatal depression is a clinical syndrome, defined by the Diagnostic and Statistical Manual of Mental Disorders 5th edition as an episode of moderate or severe depression that can begin during pregnancy or within 4 weeks of giving birth, that can have profound adverse effects on maternal and child health outcomes (American Psychological Association 2013; Patel 2003; Kapetanovic 2014). Its consequences are particularly dire for mothers who are also living with HIV because it impairs their ability to manage their illness effectively. Studies have repeatedly shown that in addition to impaired daily functioning, depression is robust predictor of poor care-seeking and retention in care, non adherence to HIV medications, and HIV disease progression (Kapetanovic 2014). A metaanalysis of 49 studies

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that examined ART adherence during and after pregnancy, found only 74% of women during pregnancy and 53% during the post-natal period had adherence >80% (Nachega 2012).

In India, studies from across the country, report a varying prevalence of perinatal depression, ranging from 9.2% to 31.4% in the perinatal period (Ajinkya 2013; Shivalli 2015). There is, however, no information on the prevalence of depression among HIV-positive pregnant or postpartum women in India and to what extent depression influences adherence to ART. The Government of India (GOI) rolled out the Prevention-of-Parent-to-Child-Transmission (PPTCT) program in 2002 with free SingleDose Nevirapine (SD-NVP) provided to women during labour and to the exposed infant. In 2013 the government piloted and in 2014 rolled out the highly efficacious Option B+ treatment regimen, wherein all pregnant HIV-positive women receive triple-drug ART for life, it is essential for the national PPTCT program to know the prevalence of perinatal depression and it correlates in this population. In this paper we report the prevalence of peripartum depression among HIV positive women receiving antiretroviral therapy (ART) in India. This study provides important insights into the association between depression, illness perceptions, adherence to treatment and health status.

Methods

A quantitative survey was conducted with HIV-positive pregnant or post-partum women at eight government antiretroviral therapy (ART) centers in four states of India: Belgaum and Hubli in Karnataka; Vashi, Ulhasnagar and Thane in Maharashtra; Meerut and Lucknow in Uttar Pradesh and Ambedkar Hospital in Delhi. All women testing HIV-positive during antenatal care (ANC) visits at government health facilities are referred to the ART centers for free ART under the PPTCT program; private health facilities also refer HIV-positive clients who cannot or do not want to pay for treatment to these centers; thus clinic clients are representative of the city population accessing public health facilities.

The sample size was set at 200 participants (50 participants per state) to obtain a preliminary estimate of the prevalence of depression in this population. The sample size was powered to be able to detect a minimum prevalence of 30% (Shivalli 2015) with 95% confidence accounting for a 15% refusal rate. All HIV positive women who were pregnant or within 14 weeks after their delivery and receiving ART from participating centers were invited to participate in the survey, when they visited the clinic for their monthly follow up visit. ART counsellors informed eligible women about the study and obtained verbal consent to participate. The counsellors then introduced the participants to research staff to complete informed consent procedures. Interviews were conducted in local language by trained research interviewers. A semi-structured questionnaire was used to collect data on the women's socio-demographic profile, current pregnancy, number of children, HIV testing history, disclosure to partners, depressive symptoms, ART adherence and illness perceptions.

The Edinburgh Postnatal Depression Scale, a 10-item tool adapted to and validated in the Indian socio-cultural context, was used to assess depression (Cox 1987, Patel 2003). Scores of 13 or more were considered indicative of psychological distress or high probability of experiencing depression (Cronbach alpha: 0.87). Adherence was assessed in two ways:

through self-reported 4-day recall of missed doses, used widely and validated in AIDS Clinical Trial Group studies, and as treatment interruptions. Self-reported adherence was dichotomised at 95% for analyses. Treatment interruption was defined as discontinuation of ART for 7 days without medical indication. Perceptions about their illness were assessed using the 9-item validated Brief Illness Perception tool ((Broadbent 2006, Robbins 2016)) designed to rapidly assess the cognitive and emotional representations of illness with scores ranging from 0 to 80; higher scores indicated more health concerns and poorer perception of health (Cronbach alpha: 0.61–0.75 in Broadbent 2006, 0.6 overall in our population). To assess the health status of study participants, the most recent CD4 cell counts were recorded from their medical records (green books).

Ethical approval was obtained from the Ethics Committee of the National AIDS Control Organization in India and the Institutional Review Board of the Population Council in New York. All participants provided written informed consent.

Data Analysis

All analyses were conducted using STATA version 10.0 (College Station, TX). Unpaired Student's t test compared continuous variables with normal distributions, and Chi square test was used to compare categorical variables of pregnant and postpartum HIV-positive participants. Binary logistic regression was used to determine correlates of prevalent depression (EPDS score ≥ 13). Variables associated on bivariate analysis ($p < 0.05$) were included in the multivariate analysis; the model was controlled for age, education and marital status.

Results

Between November, 2015 and April, 2016, 110 HIV-positive pregnant and 90 postpartum women were interviewed as they came in for services across participating centers in the four states; there was only one refusal in Hubli (the client was admitted into hospital). Table 1 details the socio demographic profile, depression and illness perception scores, and HIV related characteristics of the participants. The mean age of study participants was 25.8 years and 98% were currently married. At the time of interview, the mean duration of pregnancy was 26.4 weeks (SD: 12.1) and of the postpartum period was 9.5 weeks (SD: 6.6). For 54% ($n=108$) of the participants, this was their second/third pregnancy and for 14% ($n=28$) it was a fourth or higher order pregnancy. 22 participants (11%) had atleast one HIV-positive child. 68 participants (34%) had HIV-negative spouses and 8 women reported partners of unknown HIV status. Disclosure of HIV status to family/friends was higher among post-partum participants (77.7% vs. 66.4%; $p=0.05$).

The mean EPDS score for the study population was 12.69 (SD: 7.01). 105 participants (52.5%) had scores suggestive of depressive symptomology requiring further clinical assessment (EPDS ≥ 13) and 23% of the participants reported thoughts of self-harm; there was no difference between pregnant and post-partum participants. Pregnant participants were more likely to be ART experienced than post-partum participants (43.6% vs. 28.2%; $p=0.02$). Mean duration on ART was 15.3 months (SD: 21.3). Mean last-4-day adherence

was 91.7% (SD: 26.2); 19% of the participants reported at least one treatment interruption since they started ART. We did not find any association between depression and 4-day adherence (OR: 0.974, 95% CI: 0.920, 1.030) or with treatment interruptions (OR: 0.956; 95% CI: 0.895, 1.022). The mean illness perception score was 41.23; there were no differences between pregnant and post-partum participants.

On multivariate logistic regression analysis, poorer illness perception (higher scores) was the only independent predictor of depression (AOR: 1.09, 95%CI: 1.05, 1.14). Increasing CD4 cell counts, indicating better immune status, was associated with lower risk of depression on bivariate analysis, but the effect was not sustained in the multivariate model (Table 2).

Discussion:

In this study, we assessed the prevalence and examined the correlates of perinatal depression in HIV-positive women receiving ART in northern and southern India. This is the first study, to the best of our knowledge, to report the prevalence of depressive symptoms in this population. We found that the prevalence of depression in the perinatal period was very high (52.5%). This finding is consistent with the prevalence of depression among HIV-positive women in other countries (e.g., 39% in Uganda (Kaida 2014) at ART initiation; 27% in the antenatal period and 25% postnatally in Ukraine (Bailey 2016), but the rates are even higher in India. Further, almost a quarter of the patients reported that they had considered self-harm. A meta-analysis from India (Upadhyay 2017) reports a pooled prevalence of postpartum depression among general women in India (22%; 95% CI: 19–25), higher than in 11 high-income countries (12.9%; 95%CI: 10.6–15.8) and 23 low- and middle-income countries (19.2%; 95%CI: 15.5–23.0), suggesting that postpartum depression is more prevalent in India. It is possible social factors such as non-disclosure of HIV-status to family members (28%) due to stigma and concerns about having a HIV-negative child may have a role in the further raising the prevalence of depression reported in our study population.

The association between depression and adherence problems has been widely demonstrated in HIV-infected individuals. Although rates of depression were high and almost a fifth of the study population reported at least one treatment interruption since they started ART, the 4-day adherence was high and we did not find an association between depression and adherence. Other studies from India have reported an association between depression and adherence among non-pregnant women (Nyamathi 2012). It is possible that women had higher adherence during pregnancy and the postpartum period in an effort to have a HIV-negative infant. Longer follow-up studies are needed to explore change in adherence after the immediate postnatal period.

We did find a significant relationship between poorer illness perceptions and depression. This is consistent with the self-regulatory model (Cameron 2003) of HIV self-care as well other studies that have found illness perceptions to be associated with depression (Reynolds 2009). Thus, improving mothers' perceptions of their illness (e.g., enhancing beliefs of personal control over symptoms, reducing the number of perceived symptoms and associated emotional distress) may be important in increasing the number of mothers seeking services for postpartum depression and improving clinical outcomes. We also found

depression to be associated with poorer health status (higher CD4 cell counts were associated with a lower risk of depression on univariate analysis).

Despite the roll out of Option B+ and wider pediatric testing, we found that study participants had known their HIV-positive status for around two years on average, 11% had a previous positive child and more than half were ART naive. As Option B+ was only scaled up from 2014, it is likely that women in our study would have received SD-NVP for a previous pregnancy which is less effective than triple-drug ART. Further, prior to the roll out of the 'Test and Treat' policy from April 2017, ART for non-pregnant women was only initiated at CD4 cell counts of 350 cells/ml or less; thus, for women in our study with higher CD4 cell counts, access to ART would be relatively new. For women with a previous positive child the availability of the highly effective triple-drug ART would have provided an opportunity to have a HIV-negative child and is likely that it would have motivated them to be adherent to treatment.

The study has limitations. This was an exploratory study with a small sample size and findings may not be representative of all HIV-positive peripartum women in India. However, it is noteworthy that in each study site we interviewed all HIV-positive pregnant and postpartum women (14 weeks) who accessed PPTCT services (the universe) during our study period.

In conclusion, perinatal depression is prevalent among HIV-positive women and suicidal ideation frequently expressed. Although we did not find an association between depression and adherence, findings indicate that routine screening for depression should be integrated into antenatal care to identify those currently depressed or at risk of depression to target those needing intervention to optimize both maternal and perinatal health.

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Table 1.

Background Characteristics of HIV-positive women (2016)

	Total (N=200) N (%)	Pregnant (N=110) n (%)	Postpartum (N=90) n (%)	p-value
Age (Mean, SD)¹	25.88 (4.47)	25.73 (4.01)	26.05 (4.99)	0.617
Education²				
No formal education	38 (19)	18 (16.36)	20 (22.22)	0.313
Primary education	35 (17.5)	17 (15.45)	18 (20)	
Secondary or higher education	127 (63.5)	75 (68.18)	52 (57.77)	
Marital status^{2,3}				
Currently married	196 (98)	110 (100)	86 (95.55)	0.040
Separated/Divorced/Widowed	4 (2)	0 (0)	4 (4.44)	
Employment status²				
Not working	164 (82)	86 (78.18)	78 (86.66)	0.085
Currently working	36 (18)	24 (21.81)	12 (13.33)	
Number of months knowing HIV status¹	23.77 (25.53) ²	25.87 (27.4)	21.21 (22.93)	0.202
Disclosure²				
To none	57 (28.5)	37 (33.63)	20 (22.22)	0.052
To family or friends	143 (71.5)	73 (66.36)	70 (77.77)	
Partner's HIV status²				
HIV Positive	123 (61.5)	67 (60.9)	56 (62.22)	0.483
HIV Negative	68 (34)	37(33.6)	31 (34.4)	
Untested/ Don't know	8 (4)	6 (5.45)	2 (2.2)	
Number of Pregnancies²				
First	64 (32)	38 (34.5)	26 (28.88)	0.242
Second	61 (30.5)	31 (28.2)	30 (33.3)	
Third	47 (23.5)	26 (23.6)	21 (23.3)	
Fourth or higher	28 (14)	15 (13.6)	13 (14.4)	
Positive Child²				
Have at least 1 positive child	22 (11)	13 (11.81)	9 (10)	0.430
No other child/negative child(ren)	178 (89)	97 (88.18)	81 (90)	
ART Naïve or Experienced²				
ART Naïve	126 (63)	62 (56.36)	64 (71.11)	0.022
ART Experienced	74 (37)	48 (43.63)	26 (28.88)	

	Total (N=200) N (%)	Pregnant (N=110) n (%)	Postpartum (N=90) n (%)	p-value
Adherence to ART in last 4 days ²				
95% or more	175 (89.28)	95 (87.96)	80 (90.9)	0.336
Less than 95%	21 (10.71)	13 (12.03)	8 (9.09)	
Mean Illness Perception score ¹	41.23 (11.56)	41.13 (11.05)	41.34 (12.19)	0.904
Mean EPDS score ¹	12.69 (7.01)	12.89 (6.81)	12.45 (7.28)	0.664
EPDS ²				
Score less than 13	95 (47.5)	51 (46.36)	44 (48.88)	0.415
Score 13 or higher	105 (52.5)	59 (53.63)	46 (51.11)	
Treatment Interruption ²				
Never	156 (78)	81 (73.63)	75 (83.33)	0.087
At least once	38 (19)	25 (22.72)	13 (14.44)	
CD4 count (Mean, SD) ¹	472.92 (233.96)	483.7 (214.24)	459.51 (257.05)	0.477

¹T-test

²Chi-square test

³There were no single or unmarried participants

Table 2.

Factors associated with depression (EPDS score 13)

	Total n(%)	p value	OR (95% CI)	p value	AOR (95% CI)
Age (Mean, SD)	25.88 (4.47) [/]	.965	0.99 (0.93, 1.06)	.939	1 (0.92, 1.08)
Education					
No formal education	38 (19)			.416	1
Primary education	35 (17.5)	.948	0.96 (0.38, 2.45)	.197	2.11 (0.67, 6.61)
Secondary or higher education	127 (63.5)	.371	0.71 (0.34, 1.48)	.307	1.58 (0.65, 3.82)
Marital status					
Currently married	196 (98)				
Cohabiting/Single/Separated/Divorced/Widowed	4 (2)	.999	-	.999	-
Number of months knowing HIV status	23.77 (25.53) [/]	.400	0.99 (0.98, 1)	.770	1 (0.98, 1.01)
Employment status					
Not working	164 (82)				
Currently working	36 (18)	.153	0.58 (0.28, 1.21)		
Partner's HIV status					
HIV Negative/Untested/Don't know	77 (38.5)				
HIV Positive	123 (61.5)	.319	1.33 (0.75, 2.36)		
Number of Pregnancies					
Second or higher	136 (68)				
First	64 (32)	.903	1.03 (0.57, 1.88)		
ART Naïve or Experienced					
ART Naïve	126 (63)				
ART Experienced	74 (37)	.736	1.1 (0.62, 1.96)		
Disclosure					
To none	57 (28.5)				
To family or friends	143 (71.5)	.546	1.2 (0.65, 2.23)		

	Total n(%)	p value	OR (95% CI)	p value	AOR (95% CI)
Illness Perception score					
	41.23 (11.56) ^I	.000	1.09 (1.05, 1.12)	.000	1.09 (1.05, 1.14)
Positive Child					
No other child/negative child(ren)	178 (89)				
Have at least 1 positive child	22 (11)	.839	1.09 (0.45, 2.66)		
CD4 count					
	472.92 (233.96) ^I	.023	0.99 (0.99, 0.99)	.557	0.99 (0.99, 1)
^I Mean (SD)					