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ORIGINAL CONTRIBUTION

Depression in women living with HIV: clinical and psychosocial correlates

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Abstract The number of Brazilian women living with HIV has increased significantly in past years, rendering studies of their particular care demands including psychiatric issues. This study measures the prevalence of major depression, using the Structured Clinical Interview for DSM-IV Axis I Disorders, in a sample of 120 women living with HIV in treatment at a reference centre in São Paulo. Socio-demographic variables, HIV-related clinical and laboratory data, including CD4+ cell counts and HIV plasma viral loads, as well as psychosocial features (intimate relationships, disclosure of HIV serostatus, partner's serostatus and patient's emotional and financial support) were investigated as factors potentially associated with depression. The prevalence of major depression at the time of evaluation was 25.8% (95% CI 18.2–33.4%). Clinical status (p=0.002), lack of emotional support (p=0.02), use of antidepressants (p=0.028) and length of time since HIV diagnosis (p=0.05) were associated with major depression in univariate analysis. In multivariate multiple-regression model, HIV clinical status, lack of emotional support and higher plasma viral loads were associated with depression. Sixty per cent of the women have a major depression diagnosis during lifetime. We conclude that major depression is highly prevalent among women living with HIV, but it is still underdiagnosed and undertreated.

Keywords Women · Depression · HIV/AIDS

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Introduction

The prevalence of depressive disorder among people with chronic medical conditions is higher when compared to the general population, leading to a significant functional impairment and increased health care utilisation (Egede 2007). The 1-year prevalence of major depression in the general population is 7.1% (Andrade et al. 2002), contrasting with that seen among patients with hypertension (8%), diabetes (9.3%), stroke (11.4%), obstructive pulmonary disease (15.4%) and end-stage renal failure (17%) (Egede 2007).

Depression is one of the most prevalent psychiatric diagnoses seen in HIV-positive individuals. People living with HIV (PLWH) exhibit high prevalence of depressive disorder, estimated as 1.99-fold higher when compared to their seronegative counterparts (Ciesla and Roberts 2001). The lifetime prevalence of major depression among PLWH varies from 22% and 45% (Penzac et al. 2002). Women are particularly vulnerable since they are faced with specific burdens when living with HIV. They often feel isolated and experience shame, stigma, anxiety and feelings of ambivalence and, in addition, are challenged in their roles as caregivers, mothers and wives (Chung and Magraw 1992). Depressive symptoms in women are associated with impaired adherence to antiretroviral therapy (ART) (Carrieri et al. 2006), higher HIV plasma viral loads, higher mortality (Evans et al. 2002), less social support and a worse quality of life (Lovisi and Morgado 1996; Tostes et al. 2004), as well as perceived stress (Remien et al. 2006). The frequency of current major depressive episode among HIV-positive women ranges from 4.5% to 29% (Brown and Rundell 1993; McDaniel et al. 1995).

Many HIV-related issues, including depression rates, coping with the disease, treatment adherence, mortality rate and medication's side effects, vary for men and women.

Depression, faster declines in CD4+ count and disease progression and more complex HIV-related symptoms tend to be more common in women (Hewitt et al. 2001; Anastos et al. 2000).

Despite universal free access to antiretrovirals, women are significantly less likely to start highly active ART (HAART) treatment regimens than men (Mocroft et al. 2000) and demonstrate lower adherence to ART even after adjusting for factors such as demographics, substance abuse, clinical history and health correlates (Turner et al. 2003). Women present more HARRT side effects leading to more complex side-effect-related treatment decisions (Kremer et al. 2009). Differences in disease progression for HIV-positive men and women may be critical in understanding how men and women vary in selection of a coping strategy and experience of depressive symptoms.

Based on the premise that HIV-positive community is a heterogeneous population, it is important to understand each group's level of psychological and physical functioning accurately. By examining different groups as women, intravenous drug users, homosexual men and mentally ill individuals, we can begin to understand the various dynamics of this population and how best to serve each individual. Each piece of research that examines group differences will add clarification to our understanding of the complexities found in PLWH.

Because of its peculiar features, the Brazilian epidemic seems as an appropriate scenario to study the prevalence of depression among women living with HIV and its associated factors. Nowhere else the female HIV epidemic has increased so dramatically in the last decades. Male/female ratio of reported AIDS cases in the country has fallen from 15:1 in 1986 to 1.5:1 in 2008 (Boletim Epidemiologico Brazil 2008). This remarkable and steady increase in the proportional participation of women as clients at specialised HIV treatment centres around the country has brought a focus on the need to address women's health demands in HIV care provision. Surveys in Brazil have reported depression rates of 21% in antiretroviral naive patients (Anastos et al. 2000) and 36.8% in a sample of HIV positive women (Lovisi and Morgado 1996).

Different methodological approaches may have accounted for conflicting results. Many studies have used depression scales [Hamilton, Beck or Centre for Epidemiologic Studies Depression Scale (CES-D)] and not structured clinical interview to assess depressive symptoms and diagnoses.

In this study, we assessed, using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID I) (Spitzer et al. 1995), the prevalence of major depression in a sample of women living with HIV in treatment at a reference centre in São Paulo, Brazil. Socio-demographic, clinical and psychosocial variables that might be associated with depression in this population were also investigated. Using a standardised tool to assess depression among women living with HIV in a particular epidemiological context, we expect to contribute to a better understanding of this relevant health problem.

Materials and methods

Study population

This survey was carried out at an HIV care centre in Brazil affiliated to the University of São Paulo Medical School. Located in the city of São Paulo, this unit is a referral centre in HIV care for the central municipal area. This area of the city is mostly frequented by gay men and close to a female prostitution region. In this service, 3,500 adults living with HIV (one third are women) are under treatment with a comprehensive multidisciplinary care approach that includes clinical, gynaecological, mental health, dental and nutritional care and social work support.

As the occurrence of depressive symptoms may vary significantly in the presence or absence of HIV-related symptoms, sample size was calculated considering 25% as the estimated prevalence of depression in the asymptomatic and 50% in the symptomatic group (Tostes et al. 2004; Kremer et al. 2009), α=5% and statistical power 80%. This calculation yielded a sample of 120 women, including 60 asymptomatic (CDC class A) and 60 symptomatic (CDC classes B or C) patients (Centers for Disease Control and Prevention 1993).

During 180 days, in a consecutive sampling approach, the first five women to come to the outpatient clinic for a medical visit with a physician for infectious diseases at three different periods (8–12 a.m., 12 a.m.–4 p.m. and 4–8 p.m.) were invited to participate in the study. Patients with cognitive impairment and severe clinical disability that hampered psychiatric evaluation were excluded. Due to the high prevalence of psychiatric comorbidity among individuals with substance use disorders (SUD) and the clinic client's profile, we decided to exclude patients with those disorders (SUD) at the time of clinical evaluation.

Procedures

Patients who agreed to take part in the survey were submitted to a 45–60-min face-to-face interview performed by trained psychiatrists. A standardised questionnaire was used to investigate socio-demographic and psychosocial variables and clinical and laboratory data. CD4+ cell count and plasma viral load were obtained from the patient´s chart.

Socio-demographic variables The socio-demographic variables of interest included age, marital status (including common-law relationships), level of education, employment status and number of children.

Clinical and laboratory data Last CD4+ cell count, plasma viral load and the ART were obtained from patients' chart. Patients were asked about time since HIV diagnosis. The patients were classified as asymptomatic or symptomatic based on CDC classification (Centers for Disease Control and Prevention 1993). The use of efavirenz was assessed due to its well-known neuropsychiatric side effects.

Psychosocial variables Patients were questioned about their engagement in intimate relationships, on their partner's serostatus and whether they had HIV-seropositive children. Due to the unavailability of standardised tools for assessment of social support that are validated in the Portuguese language, this variable was addressed by the following questions: "Do you feel cared for and loved by anyone?"; "If you need financial help, will there be anyone available to help you?"; and "Did you disclose your HIV serostatus to anyone?"

Psychiatric assessment All subjects underwent a structured psychiatric interview [mood disorder section of the structured clinical interview (SCID I) for the DSM IV] (Spitzer et al. 1995) in order to determine whether they were suffering from major depression, dysthymic or adjustment disorders with depressed mood at the time of the interview and if they had a major depressive episode in the past. In such cases, patients were furthered questioned whether these episodes occurred before or after HIV diagnosis. Use of antidepressants at the time of evaluation was registered. Severity of depressive symptoms was measured by the Hamilton depression rating scale (Hamilton 1960) and the Beck depression inventory (Beck and Ward 1961). Both instruments have been translated and validated into Portuguese (Gorestein and Andrade 1996; Fleck et al. 2004). To avoid misleading interpretation due to confounding with HIV disease symptoms, severity of depression was also measured, discarding the nine somatic questions of the Hamilton scale, as previously described (Nogueira Campos et al. 2006). We considered those patients whose scores varied from 8 to 14 and 10 to 18 in the Hamilton and Beck scales, respectively, as having mild depressive symptoms, patients whose scores from 15 ot 24 and 19 to 29 in the Hamilton and Beck scales, respectively, as having moderate depressive symptoms and patients whose scores over 24 and 30 in the Hamilton and Beck scales, respectively, as having severe depressive symptoms (Nogueira Campos et al. 2006).

Ethical procedures

The study protocol was reviewed and approved by the Ethics Committee of the University of Sao Paulo Medical School Hospital. All participants provided a written informed consent.

Statistical analysis

Data obtained from the interview questionnaires and psychiatric evaluation instruments were entered into a database, using the SPSS software, which was also used for statistical analysis.

Evidence of major depression was defined as the study outcome. At first, characteristics of the study sample were presented separately for the groups of depressed and non-depressed women. Association between variables of interest and the presence of major depression at the time of evaluation was sought using the Student's t or Mann–Whitney tests and the chi-square or Fisher tests when comparing quantitative and qualitative variables, respectively. For analytic purposes and to enable logarithmic calculation, patients with undetectable HIV plasma viral loads were considered as presenting 200 HIV-RNA copies per millilitre, a value that is below the sensitivity threshold of the test (400 copies per millilitre).

Multivariate analysis was then carried out using a multiple regression model that included all variables that exhibited $p<0.20$ in univariate analysis. Variables independently associated with current depression were kept in the final model.

Those p values less than 0.05 were considered statistically significant.

Results

Patient selection

Enrolment for the study lasted 120 days. Out of 132 women living with HIV who were selected for the study, two were excluded due to substance addiction based on a psychiatric clinical evaluation and three to poor clinical status that hampered the psychiatric interview. In addition, seven women refused to participate, claiming lack of time ($n=5$) or a personal decision not to discuss their psychological status ($n=2$). The study sample comprised 120 women living with HIV.

Prevalence of the study outcome

Evidence of major depression at the time of evaluation was identified in 31 women, yielding an overall prevalence of 25.8% (95% CI 18.2–33.4).

Univariate analysis in search of factors associated with major depression

Socio-demographic features

Most patients in our sample were married, professionally active and had children. The mean age of the women was

36.1 years old (Table 1). Although depressed women were most often single (38.5%) as compared to non-depressed patients (23.6%), this difference did not reach statistical significance (p=0.43). There were no other differences in socio-demographic variables between the two groups.

Clinical and laboratory aspects

Mean CD4+ cell count was 413 cells per microlitre (SD= 241), and this laboratory marker did not differ between study groups (p=0.84). On the other hand, depressed patients had higher HIV plasma viral loads than non-depressed women (mean log copies per microlitre = 4.38, SD=1.21 vs. 3.77, SD=0.87; p=0.024). Most participants (87.5%) were under ART at the time of evaluation, but only 25 (23.8%) were receiving efavirenz. Depression was not associated with these two factors (use of ART, p=0.999; use of efavirenz, p=0.454). Time since HIV diagnosis was longer in depressed patients, and this difference was marginally significant (p=0.055). Depressed women have more often already developed symptoms associated with the HIV infection when compared to the non-depressed ones. This difference was statistically significant (p=0.002).

Psychosocial characteristics

Most women were engaged in intimate relationships with seroconcordant male partners but did not have HIV-seropositive children (Table 2). Major depression diagnosis was shown associated with lack of emotional support (p= 0.022) but not with reported financial help or disclosure of HIV diagnosis.

Psychiatric features

Besides major depression, dysthymia was detected in two (1.7%) women and adjustment disorder with depressed mood in other two (1.7%). Seventy-two (60%) women have a lifetime major depression diagnosis (past or current). Among them, 17 were diagnosed as currently depressed but reported having already had a previous episode, whereas 14 women presented their first depression episode at the time of evaluation. The remaining 41 patients were identified as having been depressed in the past, though not currently showing symptoms. Among subjects who had a major depression episode in the past, it preceded HIV diagnosis in only 13 (22.4%) women.

Depression was undertreated as only 23% of current depressed women were receiving antidepressant.

Evaluation of the severity of depression using the Hamilton depression scale and the Beck inventory showed rates ranging from 0 to 26 and from 0 to 49, respectively, with average values of 10.43 and 16.58. When using the Hamilton non-somatic scale (the somatic items were taken out), the obtained mean rate was 5.06.

Table 1 Socio-demographic variables of depressed and non-depressed women living with HIV

Variables	Major depression				Total		p value[a]
	Yes		No				
	Number	Per cent	Number	Per cent	Number	Per cent	
Marital status							
Single	12	38.7	21	23.6	33	27.5	0.437
Married	13	41.9	43	48.3	56	46.7	
Widow	4	12.9	16	18.0	20	16.7	
Divorced	2	6.5	9	10.1	11	9.2	
Employment status							
Employed	12	38.7	50	56.2	62	51.7	0.243
Unemployed	13	41.9	27	30.3	40	33.3	
Retired	6	19.4	12	13.5	18	15.0	
Level of education							
Primary school	12	38.7	29	32.6	41	34.2	0.416
Secondary school	6	19.4	23	25.8	29	24.2	
High school	7	22.6	28	31.5	35	29.2	
University	6	19.4	9	10.1	15	12.5	
Number of children							
None	9	29.0	26	29.2	35	29.2	0.594
One	10	32.3	19	21.3	29	24.2	
Two	4	12.9	18	20.2	22	18.3	
Three or more	8	25.8	26	29.2	34	28.3	

[a] Chi-square test

Table 2 Psychosocial issues of depressed and non-depressed women living with HIV

Variables	Major depression				Total		*p* value
	Yes		No				
	Number	Per cent	Number	Per cent	Number	Per cent	
Intimate relationship							
Yes	15	48.4	52	58.4	67	55.8	0.332[a]
No	16	51.6	37	41.6	53	44.2	
HIV positive partner							
Yes	5	45.5	23	54.8	28	52.8	0.582[a]
No	6	54.5	19	45.2	25	47.2	
Emotional support							
Yes	23	74.2	82	92.1	105	87.5	0.022[b]
No	8	25.8	7	7.9	15	12.5	
Financial help							
Yes	19	61.3	66	74.2	85	70.8	0.175[a]
No	12	38.7	23	25.8	35	29.2	
Diagnosis disclosure							
Yes	28	90.3	87	97.8	115	95.8	0.108[b]
No	3	9.7	2	2.2	5	4.2	

[a] Chi square test

[b] Fisher's test

Multivariate analysis in search of factors independently associated with major depression

In Table 3, we present the results of the multivariate analysis. After multivariate modelling, HIV disease clinical status, lack of emotional support and higher HIV plasma viral loads were kept in the final model as associated with depression.

Discussion

This study shows a high prevalence of lifetime and current major depression in women living with HIV (60% and 25.8% respectively). When compared to their seronegative counterparts, the increased prevalence of depression in women living with HIV might be due to a combination of the stress factors they have to cope with. These include not only the fear of death but also episodes of stigma and discrimination in family and social interactions, having to act as caregivers for sick partners or other family members and experiencing adverse effects from ART (Ferrando et al. 1999; Kaplan et al. 1997).

Table 3 Correlates of major depression among women living with HIV in São Paulo

Variables	Multivariate analyses		
	OR	95% CI	*p* value
Lack of emotional support	4.74	1.41–15.99	0.012
Clinical status	4.19	1.61–10.92	0.003
Viral load	1.46	0.99–2.14	0.055

OR odds ratio, *adj OR* adjusted odds ratio, *95% CI* 95% confidence interval

Investigations over the past years have presented prevalence rates of depression in this population ranging from 4.5 among women from the USA army (Brown and Rundell 1993) to 27.5% among Brazilian poor women (Lovisi and Morgado 1996). Conflicting results might have been due to different studied samples as shown above and different methods of assessment. Many studies used scales (Hamilton, Beck and CES-D) to estimate depression rates and few used diagnostic questionnaires (SCID). Similar to our findings, Morrison et al. (2002) reported a 19.4% prevalence of major depression among 93 American seropositive women. In addition, these authors concluded that the depressive episode was four times more prevalent among women living with HIV when compared to seronegative ones.

In our sample, most women had already had a major depressive episode in the past. This episode tended to appear after HIV serodiagnosis. Only 22.4% of women who had been depressed in the past had their episode before the diagnosis of HIV infection. This result may suggest that the first depressive episode was unleashed by the difficulties of living with this disease.

Depressive women had higher HIV viral load than non-depressed ones. Similar findings had been previously reported by Evans et al. (2002) among US women living

with HIV. The mechanism underlying this association may be multifactorial, depending on a negative influence of depression in the competence of the immune system, as well as impairing adherence to ART. It is widely known that depression affects the immune system in different ways (Zaharia et al. 2000; Schleifer et al. 1999; Miller et al. 1999). In HIV infection, Leserman et al. (1997), as well as Cruess et al. (2003) showed that stress and depressive symptoms are associated with a quantitative decline of CD8+ cell counts, an important immune response mechanism that controls HIV replication, potentially accounting for the higher viral loads detected in depressed patients.

In addition, we also found a positive association between major depression and lack of emotional support. Previous research conducted with Brazilian women living with HIV pointed out for similar results. In their survey, Lovisi and Morgado (1996) showed that not only emotional but also financial support was associated with depression in these patients. However, in both studies, a cross-sectional design precludes any conclusion on the temporality of this association. Did women become depressed as a consequence of their lack of emotional support to help them cope with HIV/AIDS, or in reverse, did depressed women have a distorted perception of the support they received?

Social support may be a critical aspect in women's quality of life and mental health. Unstable housing, depression, poverty and low level of education are associated with female gender and also with low social support. HIV-positive women incur a higher risk of mortality than HIV-positive men, a difference that is influenced by the social context of poverty. Economic crises that lead to homelessness, unmet subsistence needs and sex exchange often reorder priorities among women with HIV infection (Riley 2007).

In a study of homeless people in São Paulo (Brazil), the authors observed important differences between genders. Exchanging sex for money was the most important high risk for being HIV positive. All the women who were HIV positive and in a homeless condition related exchanging sex for money. The authors stated that specific HIV preventive actions and prevention of cervical cancer must be focused on by means of orientation and gynaecological consultations, aiming at early detection and treatment of these infections for homeless women especially for those who exchange sex for money (Brito et al. 2007).

In contrast to Ciesla and Roberts (2001), who did not find significant differences in depression prevalence between symptomatic and asymptomatic men who have sex with men, the present study observed a positive association between being symptomatic and depression in women living with HIV. Once again, due to the cross-sectional design of the study, we cannot conclude on an aetiological link between the clinical status of HIV disease and the occurrence of depression. Nevertheless, we speculate that being ill and having to cope with AIDS-related physical suffering is stressful and may lead to depression, or alternatively, as previously discussed, major depression may influence the immune system in a negative way, impairing an effective anti-HIV response and thus contributing to disease progression.

Limitations of our study include its cross-sectional design that precludes inference on the temporal associations between study variables. The relatively small sample size may be a potential limitation, but its calculation estimated this number as sufficient to detect depression rates differences between asymptomatic and symptomatic HIV-positive women.

The subjects were selected among women that came for their regular visit with the infectious disease physician and who made themselves available for the survey. This may have led to an underestimate of the prevalence of depression, since depressed women are more likely to miss their regular appointment at the clinic and thus the opportunity of being included in the study.

Women with SUD were excluded from our survey. Given that SUD is a known correlate of depression, its exclusion was meant to allow a more accurate assessment of the prevalence of depression in women living with HIV. It is important to point out that only two women were excluded from our recruited population because of a SUD diagnosis, indicating that this variable would not interfere in the results. The small number of drug addicted women reflects the client profile of the service.

Finally, our study design did not explore a potential association between depression and adherence to ART. It has been previously shown that depressed patients may be less adherent to HAART (Carrieri et al. 2006), which could account for the association we found between current depressive disorder and higher HIV viral loads. Further investigation in this regard is therefore warranted, using appropriate assessment methods to measure adherence to therapy.

In conclusion, we were able to show that lifetime and current major depressive episodes are significantly prevalent among women living with HIV in a treatment centre in São Paulo, Brazil. A better knowledge about the occurrence and the correlates of depression in this population may help identify prophylactic and intervention strategies to be set up in a comprehensive care approach to women living with HIV, ultimately aiming at improving their quality of life.

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