Posttraumatic Stress Disorder as a Significant Correlate of Voluntary Antiretroviral Treatment Interruption in Adult HIV-Infected Patients Followed up in French Hospitals:

Data From the ANRS-VESPA2 National Survey

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ABSTRACT

Objective: Although antiretroviral treatment (ART) no longer requires 100% adherence, voluntary treatment interruption (VTI) still may have a negative impact on virologic success. Previous studies have shown that posttraumatic stress disorder (PTSD) is more prevalent in HIV-infected patients than in the general population. However, no study has yet investigated the relationship between PTSD and VTI. We analyzed this relationship using data from a French national survey representative of HIV-infected adults followed up in hospitals.

Methods: A total of 3,022 HIV-infected adults participated in the ANRS-VESPA2 survey (April 2011–January 2012) and answered a face-to-face questionnaire that included the Composite International Diagnostic Interview Short-Form to diagnose PTSD and assess sociobehavioral variables such as VTI. Multivariable logistic regression models were used to study the relationship between PTSD and VTI.

Results: Among the 2,768 ART-treated participants with available data for both PTSD screening and ART interruption (study sample), prevalence of PTSD was 13.3%, and 7.2% of individuals reported VTI during the previous month. After adjustment for being a female Sub-Saharan African immigrant and reporting harmful alcohol consumption (Alcohol Use Disorders Identification Test score ≥ 8), lifetime PTSD was found to be independently associated with VTI (adjusted odds ratio [95% CI] = 1.64 [1.07–2.53], $P = .025$).

Conclusions: PTSD is highly prevalent in HIV-infected patients followed up in French hospitals and is a significant predictor of VTI. PTSD is a psychiatric disorder that is still underdiagnosed and undertreated in many countries despite its negative consequences on health behaviors. As there is evidence of effective treatment for PTSD, HIV care providers need to be trained in screening for this disorder.

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Thanks to the ever-increasing effectiveness of antiretroviral treatment (ART), HIV has become a chronic disease.[1] Despite this development, mental health disorders associated with HIV seropositivity are still of great concern. The prevalence of psychiatric comorbidities is known to be higher among HIV-infected patients than in the general population.[2,3] They can have a negative impact on adherence[4,5] and response to ART.[6] Posttraumatic stress disorder (PTSD) is increasingly recognized as a serious and potentially debilitating mental disorder.[7] PTSD may appear after the occurrence of a very stressful, potentially traumatic event in one's life.[8] In terms of function and impairment, the impact of PTSD morbidity is similar to that of depression.[9] However, the burden of PTSD is higher than that of depression, as it is an important etiologic factor of other psychiatric disorders, including affective disorders, schizophrenia, substance abuse, and personality disorder.[10]

PTSD has already been studied in populations with traumatic experiences such as war veterans[11] and persons with life-threatening diseases like cancer[12] but more rarely in people living with HIV.[13] According to the American Psychiatric Association, the diagnosis of HIV qualifies as a trauma eligible for PTSD diagnosis.[14] The prevalence of PTSD is higher in people living with HIV than in the general population and in other patient groups, for example, those with cardiovascular or vascular problems.[15] More specifically, the lifetime prevalence of PTSD in HIV-infected patients ranges from 15% to 35%,[16] while in the general population, rates ranging from 2.2% in Spain to 7.8% in the United States have been reported.[17] It is suspected that PTSD and HIV infection not only simply coexist but actively interact.[18] Indeed, studies suggest that PTSD may be associated with more risky behaviors in terms of sexuality[12,18] and substance use.[19,20] In persons living with HIV, PTSD is associated with impaired quality of life[21] and poorer health-related

Clinical Points

- The impact of PTSD on adherence to highly active antiretroviral treatment (HAART) has rarely been evaluated among HIV-positive patients.
- As PTSD is associated with voluntary treatment interruption in HAART-treated patients, it is important to improve HIV-positive patients' access to care for the disorder.

condition.[15,22,23] In addition, some studies have shown that HIV-infected individuals who have a history or current experience of PTSD are more likely to suffer from major depression,[19,23,24] perhaps because of shared vulnerability.[25] Moreover, PTSD may have a negative influence on adherence to ART.[26–31] In ART-treated individuals, despite the fact that scheduled treatment interruptions are possible and safe by consistently checking CD4 cell counts[32] and that perfect adherence is no longer considered essential to maintain the control of HIV viral load—given that more recent HIV therapies are much more forgiving of nonadherence[33]—voluntary treatment interruption (VTI) of more than a couple of days may nonetheless lead to HIV resistance.[34] This study aims at evaluating the association between PTSD and VTI, after adjusting for significant sociodemographic, behavioral, clinical, and psychosocial correlates of VTI, in a nationally representative survey of HIV-infected adults followed up in French hospitals.

METHODS

Study Design

The ANRS-VESPA2 survey was conducted between April 2011 and January 2012 to describe the living conditions of adult HIV-infected patients followed up in French hospitals. This cross-sectional study included a random sample of 3,022 male and female patients from 73 French hospital departments delivering HIV care. All participants answered an extended face-to-face questionnaire that collected data on patients' sociodemographic characteristics (gender, age, living as part of a couple, country of origin), access to care (including questions concerning patients' knowledge and perceptions about their HIV viral load and risk of HIV transmission and their experience of discrimination in different social and health contexts during the previous 2 years), history of suicide attempts, adherence to ART, past and current drug use, alcohol consumption (Alcohol Use Disorders Identification Test [AUDIT]), and employment (status and condition). Hospital physicians providing care for survey participants completed a medical questionnaire documenting biological parameters (CD4 count, HIV viral load) at diagnosis and treatment initiation as well as medical history and prescribed treatments. Data were weighted and calibrated to be representative of all adult HIV-infected patients followed up in French hospitals in 2011.[35] The ANRS-VESPA2 study was approved by the French National Commission for Data Protection and Liberties (approval number DR-2010-368). All procedures performed were in accordance with the 1964 Declaration of Helsinki and its later amendments. All participants in the ANRS-VESPA2 survey gave written informed consent.

Measures

Adherence to ART was assessed using 4 questions leading to a validated score.[36] Voluntary treatment interruption was defined as reporting to have voluntarily interrupted ART at least once during the previous month. This variable was built using the following question: "During the last month, did you voluntary interrupt your treatment for several days?" Possible responses were "No"; "Yes, once"; and "Yes, several times." Psychiatric disorders were evaluated using the Composite International Diagnostic Interview Short Form (CIDI-SF).[37] The CIDI-SF is a reduced version of the *Diagnostic and Statistical Manual for Mental Disorders,* Fifth Edition (*DSM-5*), used to estimate the prevalence of major depressive disorders in the previous year and PTSD during one's lifetime.[38,39] It has been used previously in French,[40] in accordance with European recommendations.[41] The section regarding PTSD diagnosis started with a question on the most traumatic event during one's lifetime (unexpected death of a close friend or family member, life-threatening accident or illness, rape or sexual assault, other events) and time since its occurrence. The most traumatic event was considered to be the catalyst for PTSD. Participants who answered "yes" to all 6 questions related to this traumatic event and to the effects and consequences of PTSD were diagnosed as PTSD-positive.[37] The CIDI-SF questionnaire was also used to measure the occurrence of major depressive episodes during the previous 12 months and the number of depressive self-reported symptoms collected through 8 questions on anhedonia, weight/appetite changes, insomnia, changed psychomotor activities, loss of energy or fatigue, feeling guilty or unworthy, difficulty in paying attention, and suicidal ideation.

The variable "alcohol consumption" was evaluated using the AUDIT.[42] Harmful alcohol consumption was defined as an AUDIT score ≥ 8. Drug use was defined as reporting the use of illicit drugs, excluding cannabis, at least once in the previous month.

As described in a previous publication regarding the ANRS-VESPA2 survey,[43] a sociobehavioral HIV transmission group variable was created based on the following 4 categories: (1) injection drug–using men or women, (2) men who have sex with men, (3) sub-Saharan African (SSA) immigrant men or women, and (4) other men or women.[44]

The variable "immigrant" first categorized citizenship into 3 groups (French, sub-Saharan African countries, and other).[45] Finally, the variable "sub-Saharan African immigrants vs others" was built.

Statistical Analyses

The study sample included ART-treated patients with complete data on PTSD and ART interruptions. The following characteristics were compared between patients diagnosed with PTSD and those not diagnosed: occurrence of the most

Table 1. Differences Between Patients Diagnosed and Those Not Diagnosed With PTSD in the Study Sample (N = 2,768): Data From the ANRS-VESPA2 National Survey[a]

Characteristic	PTSD (CIDI-SF–Based Diagnosis)			*P* Value[b]
	No (86.7%)	Yes (13.3%)	Total (N = 2,768)	
Age, mean (SE), y	48 (0.2)	45 (0.5)	48 (0.2)	***
Sub-Saharan African immigrant				***
No	76.3	73.2	75.9	
Yes/male	9.7	4.1	9.0	
Yes/female	14.0	22.7	15.1	
Female	29.6	47.5	32.0	***
Not living as part of a couple	58.2	63.4	58.9	.121
Unemployed	46.1	56.5	47.5	**
Harmful alcohol consumption[c]	12.1	13.9	12.4	.424
Drug use[d]	2.5	2.8	2.5	.700
Time since HIV diagnosis < 1 year	1.1	3.6	1.5	**
Chronic morbidities other than HIV	37.4	50.3	39.1	***
Major depressive episode[e]	11.0	24.4	12.8	***
Suicide attempts during life	15.9	29.7	17.8	***
Experience of discrimination during the previous 2 years	21.9	48.9	25.5	***
Lifetime event reported as most traumatic[f]				
Unexpected death of a close friend or a family member	21.6	35.4	23.4	***
Life-threatening accident or illness	9.3	29.4	12.0	***
Rape or sexual assault	2.6	10.5	3.7	***
Aggression by a close relative	1.4	1.3	1.4	.907
HIV diagnosis	0.1	0.1	0.1	.686
Fire or flood	0.5	0.7	0.5	.681
Other natural disaster including earthquake, landslide, hurricane	0.4	0.1	0.3	.332
Burglary or being threatened with a weapon	1.2	1.4	1.3	.779
Injuring or killing someone	0.1	0.9	0.3	**
Other events	9.2	19.7	10.6	***

[a]Values expressed as % of subjects unless otherwise noted.
[b]χ^2 test (categorical variables) or Student *t* test (continuous variables) for the comparison between patients diagnosed with PTSD and patients not diagnosed with PTSD.
[c]Alcohol Use Disorders Identification Test score ≥ 8.
[d]Self-report of illicit drug use at least once during the previous month.
[e]Depression assessed using the CIDI-SF scale.[38]
[f]Traumatic event: a terrible, terrifying, horrible event that caused distressing memories or dreams, feelings of detachment from other people, sleep or concentration problems, or excessive tension.
**$P < .01$.
***$P < .001$.
Abbreviations: CIDI-SF = Composite International Diagnostic Interview Short-Form, PTSD = posttraumatic stress disorder, SE = standard error.

traumatic event during one's lifetime, age, gender, living in a couple, employment status, harmful alcohol consumption, drug use, time since HIV diagnosis (less or more than 1 year), chronic comorbidities (presence/absence, as reported by survey participants), major depressive episodes, and suicide attempts during lifetime (χ^2 test for categorical variables, Student *t* test for continuous variables). Logistic regression models on weighted data taking into account the sampling scheme were used to test the relationship between PTSD and VTI and to identify the other correlates of VTI among the main sociodemographic, clinical, psychosocial, and behavioral characteristics of patients. PTSD was forced into the multivariable model. All other variables with a *P* value < 0.20 in the univariable analyses were also considered eligible for the multivariable model. A stepwise forward selection procedure with a threshold at $P = .05$ based on the likelihood ratio test was then used to build the final model.

In a secondary analysis, separate models were built to explore whether correlates of VTI differed according to the type of traumatic event associated with PTSD onset. To this end, we defined 3 PTSD variables corresponding to the 3 main traumatic events identified as probable causes of PTSD ([1] unexpected death of a close friend or a family member, [2] life-threatening accident or illness, and [3] rape or sexual assault), each with 3 categories: no PTSD, PTSD with traumatic event *i* (*i* = one of the 3 listed event types), and PTSD with other traumatic event.

Stata, Release 12 for Windows (StataCorp LP, College Station, Texas) was used for all analyses.

RESULTS

Descriptive Analysis of the Study Sample

In the VESPA2 study, 3,022 patients were interviewed, of whom 2,974 responded to the screening questions for PTSD. Of these, 2,768 had data on ART interruption (study sample), with 200 (7.2%) of the latter reporting that they had voluntarily interrupted their treatment at least once during the previous month. Of these, 118 (4.2%) had interrupted once, and 82 (3%), several times.

In the study sample, 391 patients (13.3%) were diagnosed positive for PTSD. All individuals diagnosed with PTSD reported that they still had symptoms during the month preceding the survey. The most frequent most traumatic

Table 2. Relationship Between PTSD and Voluntary ART Interruption in the Study Sample (N = 2,768): Univariable and Multivariable Analyses Using Logistic Regression (Data From the ANRS-VESPA2 National Survey)

	Voluntary ART Interruption[a]			Univariable Analyses[b]		Multivariable Analysis[b] (N = 2,768)	
	No (92.75%)	Yes (7.25%)	Total (N = 2,768)	OR (95% CI)	*P* Value	AOR (95% CI)	*P* Value
Sociodemographic and behavioral characteristics							
Age, mean (SE), y	48 (0.2)	46 (0.7)	48 (0.2)	0.98 (0.96–0.99)	**		
Socioepidemiologic group							
Man who has sex with men (ref)	40.0	31.8	39.4	1			
Former or active injection drug user	10.8	18.2	11.4	2.11 (1.14–3.88)	*		
Sub-Saharan African immigrant	22.2	24.6	22.4	1.39 (0.88–2.20)	.158		
Other	27.0	25.4	26.8	1.18 (0.74–1.90)	.481		
Sub-Saharan African immigrant/gender							
No	76.1	73.1	75.9	1		1	
Yes/male	9.4	4.2	9.0	0.46 (0.20–1.07)	.070	0.48 (0.20–1.14)	.096
Yes/female	14.5	22.7	15.1	1.62 (1.04–2.52)	**	1.93 (1.25–2.98)	**
Female gender	30.8	45.7	32.0	1.88 (1.29–2.77)	**		
Not living as part of a couple	58.6	62.5	58.9	1.17 (0.78–1.76)	.431		
Unemployed	47.3	49.9	47.5	1.11 (0.74–1.65)	.611		
Harmful alcohol consumption[c]	11.1	27.6	12.4	3.03 (1.88–4.91)	*	3.42 (2.10–5.58)	***
Drug use[d]	2.6	1.8	2.5	0.68 (0.29–1.58)	.358		
HIV-related and clinical characteristics							
Time since HIV diagnosis < 1 year	1.6	0.3	1.5	0.16 (0.02–1.17)	.071		
Chronic morbidities other than HIV	38.6	46.2	39.1	1.37 (0.93–2.00)	.105		
Psychosocial characteristics							
Posttraumatic stress disorder	12.7	20.9	13.3	1.82 (1.17–2.83)	**	1.64 (1.07–2.53)	*
No. of depressive symptoms, mean (SE)[e]	2 (0.1)	3 (0.2)	2 (0.1)	1.06 (1.01–1.12)	*		
Major depressive episodes[f]	12.8	12.6	12.8	0.99 (0.60–1.62)	.956		
Suicide attempts during lifetime	17.3	23.6	17.8	1.47 (0.97–2.25)	.070		
Experience of discrimination during the previous 2 years	24.8	34.2	25.5	1.58 (1.08–2.31)	*		
Time since self-perceived most traumatic event, mean (SE), y	14 (0.3)	13 (1.1)	14 (0.3)	0.99 (0.97–1.01)	.283		

[a]Values expressed as percentages of participants unless otherwise noted.
[b]Weighted logistic regression to take into account the sampling design of the study.
[c]Alcohol Use Disorders Identification Test score ≥ 8.
[d]Self-report of illicit drug use at least once during the previous month.
[e]Score between 0 and 8 using 1 question for each symptom.
[f]Depression assessed using the CIDI-SF scale.[38]
*$P < .05$.
**$P < .01$.
***$P < .001$.
Abbreviations: AOR = adjusted odds ratio, ART = antiretroviral therapy, CI = confidence interval, CIDI-SF = Composite International Diagnostic Interview Short-Form, OR = odds ratio, PTSD = posttraumatic stress disorder, ref = reference group, SE = standard error.

event reported by patients was "unexpected death of a close friend or a family member" (35.4%), followed by a life-threatening accident or illness (29.4%) and rape or sexual assault (10.5%). HIV diagnosis was reported as the most traumatic event by only 0.1% of patients.

Compared with non-PTSD patients, patients diagnosed with PTSD were more likely to be younger (mean [SE] = 45 [0.5] vs 48 [0.2] years; $P < .001$), to be SSA immigrant women (22.7% vs 14.0%; $P < .001$), to be unemployed (56.5% vs 46.1%; $P = .003$), and to have experienced more discrimination during the previous 2 years (48.9% vs 21.9%; $P < .001$) (Table 1). Regarding health issues, PTSD-positive patients had more non-HIV chronic comorbidities (50.3% vs 37.4%; $P < .001$), were more likely to have had a recent major depressive episode (24.4% vs 11.0%; $P < .001$), more frequently had a history of suicide attempts (29.7% vs 15.9%; $P < .001$), and were more likely to have been diagnosed with HIV during the previous 12 months (3.6% vs 1.1%; $P = .001$).

Univariable Analyses

In the univariable analyses (Table 2), diagnosis of PTSD was significantly associated with a higher risk of VTI (odds ratio, OR [95% CI] = 1.82 [1.17–2.83], $P = .009$). By contrast, time since the occurrence of the most traumatic event was not associated with VTI. The probability of VTI was also higher for younger people (OR [95% CI] = 0.98 [0.96–0.99]), women (OR [95% CI] = 1.88 [1.29–2.77]), and people who had injected drugs in their lifetime (OR [95% CI] = 2.11 [1.14–3.88]). SSA immigrant women were more likely to report ART interruption than nonimmigrant women (OR [95% CI] = 1.62 [1.04–2.52]). The probability was also higher in patients who reported hazardous alcohol consumption (OR [95% CI] = 3.03 [1.88–4.91]). Regarding psychiatric characteristics, a history of suicide attempts (OR [95% CI] = 1.47 [0.97–2.25]) and a higher number of depressive symptoms (OR [95% CI] = 1.06 [1.01–1.12]) were associated with a higher probability of ART interruption. Patients who experienced discrimination during the previous 2 years were more likely to report ART interruption (OR [95% CI] = 1.58 [1.08–2.31]) (Table 2).

Multivariable Analysis

After adjustment for the 2 variables that remained significantly associated with VTI, ie, being an SSA immigrant

Table 3. Relationships Between PTSD and Voluntary ART Interruption in the Study Sample: Three Multivariable Models According to the Type of Traumatic Event Responsible for PTSD (ANRS-VESPA2 National Survey—N = 2,769)

	Voluntary ART Interruption[a]			Multivariable Analysis[b] (N = 2,768)	
	No (92.75%)	Yes (7.25%)	Total (N = 2,768)	AOR (95% CI)	*P* Value
Model 1 (unexpected death of a close friend or a family member)					
Sub-Saharan African immigrant/gender					
No	76.1	73.1	75.9	1	
Yes/male	9.4	4.2	9.0	0.48 (0.20–1.15)	.099
Yes/female	14.5	22.7	15.1	1.92 (1.24–2.96)	**
Harmful alcohol consumption[c]	11.1	27.6	12.4	3.40 (2.09–5.54)	***
Posttraumatic stress disorder					
No	87.3	79.1	86.7	1	
Unexpected death of a close friend or a family member	4.3	9.3	4.7	2.01 (1.09–3.71)	*
Other events	8.4	11.6	8.6	1.44 (0.84–2.45)	.177
Model 2 (life-threatening accident or illness)					
Sub-Saharan African immigrant/gender					
No	76.1	73.1	75.9	1	
Yes/male	9.4	4.2	9.0	0.48 (0.20–1.14)	.094
Yes/female	14.5	22.7	15.1	1.95 (1.26–3.00)	**
Harmful alcohol consumption[c]	11.1	27.6	12.4	3.44 (2.11–5.62)	***
Posttraumatic stress disorder					
No	87.3	79.1	86.7	1	
Life-threatening accident or illness	3.9	3.8	3.9	0.92 (0.43–1.99)	.831
Other events	8.8	17.1	9.4	1.98 (1.23–3.18)	**
Model 3 (rape or sexual assault)					
Sub-Saharan African immigrant/gender					
No	76.1	73.1	75.9	1	
Yes/male	9.4	4.2	9.0	0.48 (0.20–1.14)	.096
Yes/female	14.5	22.7	15.1	1.94 (1.26–2.99)	**
Harmful alcohol consumption[c]	11.1	27.6	12.4	3.39 (2.08–5.54)	***
Posttraumatic stress disorder					
No	87.3	79.1	86.7	1	
Rape or sexual assault	1.4	1.2	1.4	0.93 (0.30–2.91)	.902
Other events	11.3	19.7	11.9	1.72 (1.10–2.70)	*

[a]Values expressed as percentages of participants.
[b]Weighted logistic regression to take into account the sampling design of the study.
[c]Alcohol Use Disorders Identification Test score ≥ 8.
*$P < .05$.
**$P < .01$.
***$P < .001$.
Abbreviations: AOR = adjusted odds ratio, ART = antiretroviral therapy, CI = confidence interval, PTSD = posttraumatic stress disorder, SE = standard error.

woman (adjusted OR [95% CI] = 1.93 [1.25–2.98]) and reporting harmful alcohol consumption (3.42 [2.10–5.58]), PTSD diagnosis remained significantly associated with VTI (1.64 [1.07–2.53]) (Table 2).

Secondary Analysis

In the 3 multivariable models differentiating the traumatic event that caused PTSD (Table 3), PTSD diagnosis and being an SSA immigrant woman remained independently associated with VTI. In addition, the unexpected death of a close friend or a family member was the only traumatic event significantly associated with VTI (adjusted OR [95% CI] = 2.01 [1.09–3.71]).

DISCUSSION

The main result of the present study is the significant positive correlation between PTSD and voluntary ART interruption. This correlation was still significant after adjusting for known correlates of ART interruption such as gender, being an SSA immigrant, and harmful alcohol consumption. This endorses the results of other studies identifying PTSD as a barrier to adherence to ART.[46,47]

Another important result in this study is that the prevalence of PTSD was 6 times higher in ART-treated HIV-infected patients followed up in French hospitals (13.3%) than in the French general population, estimated at 2.2%.[48] This value is lower, however, than in other studies addressing PTSD in HIV-infected populations. For instance, a meta-analysis focusing on HIV-positive women in the United States showed that an estimated 30% had PTSD.[49]

As already described in the literature,[8] the 3 events described as "most traumatic" in the present study were the unexpected death of a close friend or a family member, a life-threatening accident or illness, and rape or sexual assault. HIV diagnosis was not reported as the most traumatic event. This result corroborates a previous study which showed that HIV infection was not seen as a traumatic event responsible for PTSD.[50] Nonetheless, in our study, being recently diagnosed with HIV was associated with PTSD. This second

result is in line with other studies showing a significant link between HIV infection and PTSD. More specifically, they show that HIV-related neurobiological alterations may play a role in the onset of PTSD.[18,51]

In addition, when studying the correlation between each type of traumatic event and voluntary ART interruption, we found that the unexpected death of a close friend or a family member was the only traumatic event associated with ART interruption. It has been suggested that this traumatic event is associated with a significantly elevated risk of first onset of other psychiatric disorders (depression, anxiety, etc).[52] However, we cannot rule out the possibility that other types of trauma increase the risk of VTI. The relatively low percentage of patients in the study population reporting a life-threatening accident or illness or rape or sexual assault as the most traumatic event during their lives may lead to a lack of statistical power, thereby preventing us from detecting this association.

Some well-known correlates of ART interruption were also confirmed in our study. First, high level of alcohol consumption was associated with a higher risk of ART interruption, which corroborates the findings of previous studies.[53–56] PTSD has already been associated with greater alcohol use,[57–60] the suggestion being that alcohol may be used to alleviate PTSD-associated symptoms such as anxiety or panic.[58,59] However, our findings show an association between PTSD and ART interruption independent of alcohol consumption. Some alcohol consumption–focused interventions have been implemented to improve adherence to ART with positive results. For example, it has been suggested that patients are receptive to brief motivational interviewing and cognitive behavioral therapy–type adherence interventions.[61] In addition, a recent randomized trial showed the efficacy of an intervention based on motivational interviewing on alcohol-related problems.[62]

Second, women immigrants from SSA were more likely to report ART interruption. Since women may be more sensitive than men to the social effect of HIV (discrimination, stigma, etc) due to their greater vulnerability to depressive and anxiety symptoms,[63] immigrant women constitute an even more vulnerable population. A previous study has suggested that women-oriented psychosocial counseling and screening for anxiety symptoms may improve adherence to ART.[64] Immigrant status creates additional vulnerability, since immigrant women are more likely to have experienced traumatic events such as war, persecution, torture, sexual violence, and the challenges of resettling in exile.[65] However, our findings show that being a immigrant woman is correlated with ART interruption, independently of the possible causes of PTSD. A study conducted among HIV-infected African and Caribbean immigrant black women in Canada emphasized the importance of addressing the problem of housing insecurity and paying attention to stigma and discrimination.[66] Immigrant women therefore deserve more attention in terms of psychosocial support and adapted clinical care.

All of these results provide an additional argument supporting the need for early detection of traumatic events in HIV patients and the presence of PTSD symptoms. For instance, a sociopersonal biographical interview has already been suggested as a useful tool for clinicians caring for HIV-infected patients to identify traumas and adapt clinical management accordingly.[46] It has also been suggested that a care model in which experience of trauma is systematically recorded and managed should be proposed to HIV-positive patients in order to better deal with psychiatric and behavioral issues related to PTSD symptoms.[67] A meta-analysis has demonstrated that eye movement desensitization and processing treatments significantly reduce the symptoms of PTSD[68] and that these treatments can have important positive repercussions on psychiatric comorbidities associated with PTSD. Although a few studies have shown the effectiveness of interventions in other contexts (eg, monetary incentives in PTSD-positive opioid users,[69] telephone care management to improve treatment attendance among PTSD veterans,[70] memory specificity training and cognitive processing therapy[71]), no treatment in HIV-positive PTSD patients has been assessed. As PTSD among HIV-positive individuals is associated with incomplete adherence and stigma,[72] it is important to reduce HIV stigma and to provide better clinical management of PTSD in this population.

Some limitations of the study should be acknowledged. Its cross-sectional design prevented us from analyzing temporal relationships between PTSD and voluntary ART interruption. The main strength of this study is that the data are representative of the HIV population followed up in French hospitals in 2011.

CONCLUSION

PTSD is highly prevalent in HIV-infected patients followed up in French hospitals and is a major predictor of voluntary ART interruption. PTSD is a psychiatric disorder that is still underdiagnosed and undertreated in many countries despite its negative consequences on health behaviors. As there is evidence of effective treatment for PTSD, HIV care providers need to be trained in screening for this disorder.

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