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Screening Anxiety in the HIV Clinic

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Abstract

Individuals with HIV experience fluctuating levels of distress throughout the course of their infection. This cross-sectional study was conducted to examine the prevalence of and associations between anxiety symptoms, sociodemographic, and biomedical markers among individuals presenting for care at an urban HIV clinic. A total of 635 individuals were screened, the majority of whom was male and African American. Twenty-two percent of the sample reported symptoms of moderate anxiety and 11% reported severe anxiety symptoms. In unadjusted analyses, African Americans, individuals with less education, younger individuals, and those who were unemployed were more likely to express more severe anxiety symptoms. Individuals who were not currently receiving antiretroviral therapy (ART) were 1.61 times more likely to experience higher anxiety symptoms. In unadjusted analyses among individuals receiving ART higher levels of anxiety were associated with less adherence, higher viral loads and lower CD4 cell counts. Current smokers were 1.66 times more likely to have higher rates of anxiety. When controlling for these significant factors, younger, unemployed, or less educated individuals were more likely to express more severe anxiety symptoms. These findings highlight the importance of screening and treatment of anxiety as an integral component of HIV care.

INTRODUCTION

The Centers for Disease Control and Prevention (CDC) estimates that over 1 million people in the United States are living with HIV infection.(1) In Missouri, approximately 10,000 people are living with HIV infection, 5,000 of whom are in the St. Louis region (2). Increasingly, HIV infection is being considered and treated as a chronic medical condition (3). Considerable improvements in the effectiveness and availability of medical treatments for HIV disease have occurred (1). As individuals with HIV infection are living longer, quality of life issues and secondary prevention efforts are being embedded in comprehensive care practices (4).

General Anxiety Disorder (GAD) affects approximately 6.8 million American adults, (5) and is more prevalent among patients with chronic diseases (6). Notably, the amount of psychological distress among individuals with HIV infection is significantly higher than the general population (7). Furthermore, this population is affected by variable levels of distress throughout the course of their infection with negative consequences (8–10). During periods of distress, individuals with a chronic illness may not only have lower quality of life, but also have difficulty engaging in behaviors that are health promoting (11–13). Minimal research has focused on the impact of symptoms of anxiety on HIV management and associated health behaviors. Specifically, the prevalence of anxiety among HIV-infected individuals and the effect of anxiety on adherence with antiretroviral therapy (ART) and engagement in high risk and health-compromising behaviors remains to be fully elucidated. With increased understanding of this relationship, simple, evidenced-based interventions can be administered in clinical settings to reduce anxiety. This study was developed to investigate the prevalence of anxiety among HIV-infected individuals and the association between anxiety and behavioral and HIV-related laboratory parameters. A better understanding of the relationship between anxiety and barriers to optimal care will enhance the quality of life and services provided for individuals with HIV infection.

METHODS

This cross-sectional study analyzed the relationship between symptoms of anxiety, sociodemographic factors, HIV-related risk behaviors, and the association with HIV-related outcomes. As part of standard-of-care, a convenience sample of all patients who attended the Washington University HIV Clinic (St. Louis, MO) completed a behavioral assessment during regular clinic visits between June and December 2009 (n=635). As each patient entered their assigned clinic exam room, a trained interviewer conducted the paper-based interview prior to the health care provider visit. Seven percent of the clinic population (n=49) surveyed refused or were unable to complete the interview. The interview collected current sociodemographic characteristics (race, age, employment, education, and income), alcohol use (frequency and quantity), smoking behavior (current, history, and quantity), condom use at last sex, self-reported medication adherence, and symptoms of anxiety. Race was dichotomized by Caucasian and African American/other, education was dichotomized to high school diploma and > high school. Employment was dichotomized to include any (part- and full-time) employment and unemployment. Income was categorized as identified in Table 1. The medical chart abstractions were conducted by medical assistants who collected the laboratory measures (CD4 cell count and HIV viral load) from participants' medical records. This study was approved by Washington University School of Medicine Human Research Protection Office.

Risk Behavior Definitions

Alcohol use was assessed for all individuals who reported drinking within the past 4 months; a daily recall was conducted for those who endorsed drinking in the past 7 days. Smoking behavior was defined as answering yes or occasionally to the question "Do you currently smoke cigarettes?" Pack-years were estimated by assigning .5, 1, 1.5 and 2 to the following responses "less than ½ pack per day", "at least ½ but less than 1", "at least 1, but less than 2", and "more than 2" and multiplying it by the number of years smoked. At risk sexual behavior was defined as reporting not using a condom during their last sexual encounter, if they reported having engaged in sexual activity in the previous 3 months.

The use of 3 antiretroviral drugs from 2 or more classes defined ART. Self-reported medication adherence was measured using the Visual Analogue Scale (VAS)(14) and dichotomized to < 95% and ≥ 95%, as commonly used.(15) Biomedical markers including current CD4 cell count and current HIV viral load were collected at time of the visit. For

analysis, CD4 cell count was dichotomized into two groups: 0–199 or ≥ 200 cells/mm³. A HIV viral load of < 400 copies/mL defined viral suppression.

The Generalized Anxiety Disorder-7 (GAD-7) was used to measure the severity of anxiety symptoms. This scale has good internal and test–retest reliability, as well as convergent, construct, criterion, procedural, and factorial validity for the diagnosis of generalized anxiety disorder.(16) Scores on the GAD-7 range from 0 to 21; scores of 0, 1–9, 10–14 and 15 or higher represent no, mild, moderate, and severe anxiety symptoms, respectively (17). For analysis, anxiety scores were dichotomized into no/mild symptoms if scores were 0–9, and moderate/severe symptoms if scores were ≥ 10. Depressive symptoms were also collected using the Patient Health Questionnaire-9 (18); this analysis is focused upon anxiety, as it is less often examined among HIV-infected populations. Correlations of these symptoms are included in the results.

Analysis

The objective of the data analysis was to determine if there were differences in engagement in risk behaviors, self-reported medication adherence, CD4 count, and HIV viral load by anxiety severity. All analyses were conducted using SPSS version 17.0. The relationship between GAD-7 scores and alcohol consumption was assessed using a one-way ANOVA. To determine whether the data were normally distributed, we used Blom's proportion estimation formula which identified the anxiety scores scale to be 5.77 and the location to be 5.65. The data were highly clustered around the sample mean. Chi-square tests and ANOVAs were conducted to analyze the relationship between GAD-7 scores and unprotected sex, smoking, medication adherence (measured by self-report and viral load). Logistic regression analyses were conducted with having moderate to severe symptoms of anxiety as a dependent variable. Significant variables were included at the 0.1 level. Pearson's correlation coefficient was conducted to assess the relationship between total depressive and anxiety symptom scores.

RESULTS

Demographics

A total of 635 individuals completed the assessment and had a mean age of 41.7 years (range 18–75, SD=11.3). The majority of the population was male (n = 435; 69%) and African-American/other (n = 458; 73%). Approximately one-half (n = 335) had a high school education and 47% (n = 293) had some college education or higher. Approximately 51% (n = 322) reported an annual income of less than \$10,000 and 31% (n = 193) between \$10,000 and \$29,999. Three-quarters of the sample reported mild anxiety symptoms (n = 472), 12% (n = 73) had moderate anxiety symptoms, and 11% (n = 70) had severe anxiety symptoms (Table 1). Nearly 80% (n = 483) of the sample were receiving ART, with viral suppression in 83% (n = 403). Table 1 shares the sample description. The correlation between anxiety and depressive symptoms was high at 0.84 (p < 0.01).

There were significant differences in rates of moderate to severe anxiety by sociodemographic characteristics. African American individuals were 1.56 times (95% CI: 1.07, 2.27), those with less education 1.82 times (95% CI: 1.33, 2.49), and those who were unemployed were 1.75 times (95% CI: 1.25, 2.44) more likely to express moderate/severe anxiety symptoms (p < 0.05 for both). Additionally, individuals between the ages of 18 and 34 years reported higher rates of moderate/severe anxiety symptoms as compared to those who were 50 years or older (p < 0.05).

HIV Management

More severe anxiety symptoms were reported among individuals who did not have a current prescription of ART (OR: 1.61, 95% CI: 1.20, 2.16; $p < 0.05$). For those receiving ART, medication adherence was significantly affected by symptoms of anxiety. Individuals expressing moderate anxiety symptoms were 1.66 times more likely to report $< 95\%$ medication adherence (95% CI: 1.17, 2.37; $p < 0.05$). Furthermore, individuals with moderate/severe anxiety had a greater likelihood of having a CD4 count < 200 cells/mm³ (OR: 1.46, 95% CI: 1.06, 2.02; $p < 0.05$) and were more likely to have unsuppressed viral loads (OR: 1.71, 95% CI: 1.29, 2.26; $p < 0.05$) (see Table 2).

Risk Behaviors

Drinking alcohol in the previous 3 months did not significantly differ by anxiety severity, although increased alcohol use approached significance among those with moderate/severe anxiety ($p = 0.058$). Current smokers reported symptoms of moderate/severe anxiety more often than non-smokers (OR: 1.61, 95% CI: 1.24, 2.23; $p < 0.05$). However, higher pack-years were not associated with higher rates of anxiety symptoms. There was no difference in reported unprotected sex by severity of anxiety symptoms.

Multivariable logistic regression models were conducted with two methods, 1) individuals receiving ART and 2) all individuals. The significant independent associations were identical. When controlling for race, education, employment, ART receipt, self-reported medication adherence (in model of individuals who received ART only), CD4 cell counts, and HIV viral loads, we found that younger individuals were 1.90 (95% CI: 1.32, 2.74) times more likely, unemployed individuals were 3.89 (95% CI: 2.07, 7.35) times more likely, and those who attained less education 1.69 (95% CI: 1.01, 2.84) times more likely to report moderate/severe anxiety symptoms ($p < 0.05$ for all). The magnitude of these relationships is depicted in Table 3.

DISCUSSION

Symptoms of General Anxiety Disorder among individuals seeking medical care in an urban outpatient HIV clinic were identified among approximately one-quarter of our sample. The findings identified sociodemographic characteristics, HIV-related biomarkers, and engagement in risk behaviors that were associated with moderate to severe symptoms of anxiety. These findings emphasize the need to actively screen and manage symptoms of Generalized Anxiety Disorder among populations with HIV.

Anxiety is more frequent among persons with chronic illnesses (6). With the transformation of HIV infection into a manageable chronic illness, the prevalence of anxiety in this sample supports this finding as well. Specific to HIV management, anxiety was related to antiretroviral nonadherence, and hence, unsuppressed HIV viral loads. As previously reported, depression, specifically if untreated, is associated with negative HIV-related health outcomes (19, 20). Correlations between symptoms of depression and anxiety are traditionally high, and were high in this sample as well. Thus, screening for both mood disorder symptoms will enhance health outcomes in populations with HIV infection as the expression of psychological distress may manifest either as depressive or anxiety symptoms. Furthermore, routine screening for psychological distress may offer an important opportunity to consider treatment among individuals who have never before expressed their symptoms and severity due to limited opportunities (21, 22). Comprehensive HIV-related support services in Ryan White supported clinics have created the opportunity for individuals to seek mental health care within the framework of this effective care model (23).

Significant relationships between sociodemographic characteristics that were identified have previously been found in HIV-negative populations (age, education, and employment status), (5, 24) as well as among infected populations when examining associations with depressive symptoms (20, 25). While education and employment are difficult to address in health-related interventions, understanding the relationships that these factors have with management of HIV disease offers an opportunity for better understanding patient needs. Additionally, being unemployed has been repeatedly identified as an adverse factor in health outcomes (20, 26, 27). This suggests that individuals need help managing and understanding how to best manage their care, perhaps due to the associated actual and socially experienced costs of HIV infection. Previous research has found a link between higher rates of depression and having minor dependents, this association was not identified when examining anxiety symptoms (20, 28). While the data were not collected in this study, previous research suggested that HIV management may not be the cause of distress, as HIV management may have become more routinized with less complicated medication adherence necessary and medication becoming more tolerable. Therefore, daily stressors such as unemployment, felt discrimination, unstable housing may cause more anxiety than HIV infection (29). Thus, the treatment of anxiety in this clinic setting may be less of a medication prescription, but a referral to a case manager or mental health clinician to discuss these symptoms and etiology.

We also found that self-reported antiretroviral nonadherence, low CD4 cell counts and elevated HIV viral loads were associated with more severe anxiety symptoms. While HIV management biomarkers were not significant in the binary logistic regression model, this highlights an opportunity for intervention to reduce anxiety symptoms in clinic settings in order to improve HIV-related health outcomes, as they are correlated. Additionally, the difference in symptom expression may differ between anxiety and depression so screening for both will more effectively identify persons with mood disorders. For many of individuals seeking HIV care, this may be the first time that distress symptoms are being evaluated as they have not had the opportunity previously (21).

Current smokers reported increased anxiety severity. As this is a cross-sectional analysis, we are unclear of the directionality of the association. We would hypothesize that individuals manage anxiety symptoms with cigarette smoking, and that this relationship occurred prior to HIV infection. These findings highlight that symptoms are not being alleviated with smoking, as may be intended by the smoker. Thus, identifying both anxiety symptoms and chronic disease related behaviors, (smoking, in this case), may improve HIV-related health outcomes. As there was no significant relationship found between pack-years and anxiety severity, smoking cessation will improve physical health and potentially alleviate psychological distress.

The causal relationship between HIV management biomarkers and anxiety symptomatology is difficult to separate without a longitudinal examination. In this study, analyses suggested that medication adherence, HIV viral load, and CD4 count were all related to anxiety symptoms. It is unclear if individuals are experiencing high levels of anxiety and therefore, not taking their antiretroviral medications with resultant failure to suppress viral load or whether ongoing uncontrolled viremia causes anxiety. While we cannot determine causality, it is clear that higher levels of anxiety are negatively related to virologic suppression. Additionally, this population was comprised of mostly African American men, and therefore the results may not be generalizable to other populations. Furthermore, the study was conducted at a single outpatient HIV clinic, thus findings are not able to be generalized to all outpatient HIV clinics.

In conclusion, this study served to examine the prevalence and severity of anxiety among individuals attending a urban HIV outpatient clinic in the US. These findings highlight the importance of screening and treatment of anxiety as an integral component of HIV-related care. Future research should expand this study to examine the relationships between psychological distress symptoms, risk behaviors, and HIV management factors longitudinally to allow for identify causal relationships.

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Table 1

Clinic Sample Demographic and HIV-Related Medical Characteristics (n = 629)

	n	%
Gender		
Male	435	69.2
Female	169	26.9
Race		
African American	458	72.8
Caucasian	169	26.9
Age Category		
18–34 years	181	28.8
35–49 years	296	47.1
50 years	152	24.2
Children in home		
No minor dependents	479	76.2
1 Minor dependent	150	23.8
Employment status		
Employed	245	39.0
Unemployed	382	60.7
Income (n = 470)		
\$10,000	322	51.2
\$10,000–29,999	193	30.7
\$30,000	103	16.4
Education		
High school degree	335	53.3
> High school degree	293	46.6
HAART Prescription		
Not on ART	145	23.1
Currently on ART	483	76.8
Viral load (on ART)		
<50 copies/mL	362	57.6
>50 and < 400 copies/mL	63	10.0
400 copies/mL	200	31.8
CD4 cell count (n = 577)		
0–199 mm ³	119	18.9
200–349 mm ³	125	19.9
350–499 mm ³	120	19.1
500 mm ³	213	33.9

Table 2
Associations between Sociodemographic Characteristics and Severity of Anxiety Symptoms

	No/Mild (n= 477)		Moderate/Severe (n = 144)		P value	Unadjusted Odds Ratio	Adjusted Odds Ratio
	n	%	n	%			
Gender							
Male	330	69.9	94	65.7	0.344	Ref	
Female	142	30.1	49	34.3		1.15 (1.05, 1.15)	
Race							
African American/Other	334	70.9	115	81.0	0.017	1.56 (1.07, 2.27)	
Caucasian	137	29.1	27	19.0		Ref	
Age Category							
18–34 years	122	25.8	54	37.8	0.003		1.90 (1.32, 2.74)
35–49 years	222	47.0	67	46.9			
50 years	128	27.1	22	15.4			Ref
Education							
High school Degree	232	49.2	96	67.6	0.001	1.82 (1.33, 2.49)	1.69 (1.01, 2.84)
> High School	240	50.8	46	32.4		Ref	Ref
Employment							
Unemployed	271	57.5	105	73.4	0.001	1.75 (1.25, 2.44)	3.89 (2.07, 7.35)
Employed	200	42.5	38	26.6		Ref	Ref
1 Minor Dependent	107	22.7	38	26.6	0.335	1.17 (1.18, 1.62)	
No current ART prescription	94	19.9	46	32.2	0.002	1.61 (1.20, 2.16)	
Self-reported medication adherence (n= 476)							
< 95%	95	25.1	38	39.2	0.006	1.66 (1.17, 2.37)	
95%	284	74.9	59	60.8		Ref	
CD4 cell count (n = 577)							
0–199 mm ³	79	18.3	36	27.3	0.026	1.46 (1.06, 2.02)	
>200 mm ³	352	81.7	96	72.7		Ref	
Unsuppressed viral load							
< 400 copies/mL	338	72.2	80	55.9	0.001	Ref	Ref
400 copies/mL	130	27.8	63	44.1		1.71 (1.29, 2.26)	1.36 (1.09, 1.70)
Current smoker	203	43.0	85	59.4	0.001	1.66 (1.24, 2.23)	1.61 (1.06, 2.47)

	No/Mild (n= 477)		Moderate/Severe (n = 144)		P value	Unadjusted Odds Ratio	Adjusted Odds Ratio
	n	%	n	%			
Condom use at last sexual encounter	162	82.2	49	75.4	0.227	1.35 (1.19, 2.17)	
Current alcohol use (n = 396)	308	65.3	88	61.5	0.416	1.13 (1.19, 1.52)	