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Recent sex trade and injection drug use among pregnant opiate and cocaine dependent women in treatment: The significance of psychiatric comorbidity

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Abstract

Objectives—This study examined whether opioid and cocaine dependent pregnant women with psychiatric comorbidity were at elevated risk for infectious disease by virtue of recent sex trade and injection drug use that overlapped with pregnancy. We hypothesized that opioid and cocaine dependent women with psychiatric comorbidity would have greater odds for engaging in recent sex trade and injection drug use.

Methods—Eighty-one, HIV-seronegative pregnant women (59.3% African-American, 37% white, and 3.7% other) who were enrolled in drug treatment in Baltimore, Maryland were recruited into an HIV prevention intervention study, provided informed consent, and attended an in-person, baseline assessment administered by trained clinicians. Assessments included the Structured Clinical Interview for DSM-IV-TR Axis I Disorders, the HIV Risk Behavior Interview, and a demographic questionnaire. The majority of women had lifetime histories of opioid and/or cocaine dependence (93.8%) and those with an additional lifetime non-substance-related Axis I disorder comprised the psychiatric comorbidity group.

Results—Thirty-percent reported recent sex trade and/or injection drug use that overlapped with pregnancy. While psychiatric comorbidity was associated with 6 times the odds of opioid and cocaine dependent pregnant women having recently traded sex it was not associated with recent injection drug use.

Conclusions—Findings underscore the need to (1) treat comorbid psychiatric disorders among pregnant women in treatment for cocaine and opioid dependence and (2) integrate HIV prevention interventions into drug dependence treatment for pregnant women, particularly those with psychiatric comorbidity given their elevated risk for infectious disease.

Keywords

psychiatric comorbidity; prostitution; injection drug use (IDU); pregnancy; drug dependency

INTRODUCTION

Pregnant women with opioid and cocaine dependence are confronted by numerous challenges facing their health and pregnancy.^{1–3} Unfortunately, there is a paucity of approaches to the treatment of opioid and cocaine dependence developed to address the unique challenges presented by drug dependent pregnant women.^{4–7} A particular concern

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with substantial significance to the health of both the pregnant mother and the fetus concerns the degree to which pregnant women with drug dependence exhibit sexual or injection risk behavior that may predispose them to contract HIV⁸ or other infectious diseases including sexually transmitted infections, such as syphilis, gonorrhea, and trichomonas.^{9, 10}

One central yet understudied individual characteristic which has been shown to be associated with heightened infectious disease risk behavior in drug treatment populations involves the presence of psychiatric comorbidity.^{11–13} Yet, amidst the array of psychosocial and legal challenges facing the treatment of drug dependent pregnant women,^{1, 2, 4, 14–16} the potentially considerable significance of comorbid psychiatric disorder status in relation to infectious disease risk behavior in this population has heretofore not been addressed. To the extent that pregnant women with opioid and cocaine dependence exhibit elevated rates of HIV and other infectious disease risk behavior by virtue of undetected and untreated psychiatric comorbidities, the health of both women and their fetuses are probably greatly compromised.

High rates of psychiatric comorbidity have been documented among drug dependent adult populations, including pregnant women in drug treatment.^{17–20} Approximately half of all adults (41–65%) with a lifetime substance use disorder also have a lifetime history of at least one comorbid psychiatric mental disorder.¹⁷ More recent reports suggest that adults with a lifetime drug dependence diagnosis are 6.5 times more likely to have a comorbid mood disorder and 4.9 times more likely to have any anxiety disorder after adjusting for demographic variables such as age, race, and gender.¹⁸ Almost half (44%) of opioid abusers entering a methadone treatment program were found to have a lifetime non-substance use Axis I or Axis II diagnosis.²⁰ In a study of pregnant, substance abusing women from a residential treatment program, 51% were identified as having a history of comorbid psychiatric diagnoses.¹⁹ These findings suggest that nearly half of drug dependent populations, including pregnant women in drug treatment, suffer from a comorbid psychiatric disorder during their lifetime.

The significance of examining psychiatric comorbidity among opioid and cocaine dependent pregnant women is underscored by research suggesting elevated infectious disease risk associated with psychiatric comorbidity paired with the negative health consequences of HIV and other infectious diseases during pregnancy for the mother and fetus. Burnette and colleagues¹¹ studied women seeking treatment for drug dependence and found that anxiety and psychotic symptoms were associated with women's prostitution after controlling for the effects of age and childhood sexual abuse. In another study by El-Bassel and colleagues,¹² psychological distress was found to be associated with sex trade among women in methadone maintenance programs. Thus, extant study findings among drug dependent women in treatment suggests that a co-existing psychiatric symptoms may place women at heightened risk to contract HIV and other infectious diseases by virtue of elevated risk behavior associated with psychiatric disorder status. This relationship between psychiatric disorder status and elevated infectious disease risk is particularly relevant to opioid and cocaine dependent women who are pregnant because both the diseases themselves and the treatments for the diseases may adversely affect the health of both mothers and their fetuses.^{9, 10, 21, 22}

Even since the era of highly active antiretroviral therapies, pregnant women infected with HIV in the United States are still at greater risk for a number of health problems including bacterial infections and premature delivery compared to noninfected pregnant women.²² Antiretroviral treatments also pose adverse health problems to both mother and fetus.²¹ Additionally, sexually transmitted infections (STI's) present a number of health risks for both mother and child including miscarriage, preterm delivery, and congenital infection;¹⁰

they also facilitate transmission of HIV. Furthermore, treatments for STI's are limited for pregnant women given health risks for the fetus.⁹ Other infectious diseases, including hepatitis B and hepatitis C are also associated with adverse health problems for women and their fetuses.²³ Given the adverse health consequences of pregnant women contracting infectious diseases through high risk sexual and injection drug use (IDU) behaviors, studies examining markers of these risk behaviors such as psychiatric comorbidity status are warranted to help inform prevention interventions for this high risk population.

The present study sought to address gaps in the literature by examining the degree to which pregnant women with opioid and cocaine dependence who also exhibit psychiatric comorbidity are at elevated risk for infectious disease by virtue of recent sex trade and IDU. We examined these infectious disease risk behaviors during an interval overlapping with women's pregnancies to examine the degree to which psychiatric comorbidity might have ramifications for the health of both women and their children. We hypothesized that lifetime psychiatric comorbidity would be associated with both sex trade and IDU among opioid and cocaine dependent pregnant women after controlling for associated demographic variables including age, education, and ethnicity.

MATERIALS AND METHODS

Participants and procedures

This study was comprised of participants from a study to adapt an Integrated Family and Cognitive-Behavioral HIV Prevention Intervention (IFCBT-HIVPI) for use with pregnant women.^{24–26} The study was approved by the institutional review board of Johns Hopkins Bloomberg School of Public Health. Eighty-one, HIV-seronegative pregnant women who were enrolled in drug treatment at the Johns Hopkins Center for Addiction and Pregnancy in Baltimore, Maryland were recruited into this study, provided informed consent, and attended a face-to-face, standardized baseline assessment that obtained information about participants' mental health and HIV risk behaviors. The assessments were administered by clinicians and participants were remunerated \$40. Women excluded from participating in this study were those who had: 1) complications of pregnancy (e.g. gestational diabetes or hypertension), 2) evidence of fetal malformation, 3) significant maternal health problems that were unrelated to pregnancy (e.g. HIV infection or Type I diabetes), 4) psychosis, and/or 5) acute suicidal ideation.

Measures

HIV risk behavior—The HIV Risk Behavior Interview contains detailed questions about sexual practices and drug use behavior. Responses to the following questions were used to assess sex trade: “Has anyone ever given you drugs to have sex?” and “Has anyone paid you money, given you shelter, or given you anything other than drugs to have sex?” Women who positively endorsed either of these behaviors were then asked more detailed questions about sex trade including the number of days they had traded sex during the previous 6 months. Injection drug use was assessed by the question asking “Have you ever injected any kind of drug at anytime in your lifetime?” and “Did you inject any drugs of any kind in the past 6 months?” Dichotomous variables regarding whether women had traded sex or injected drugs in the past 6 months were used in this study's analyses.

Axis I disorders—The Structured Clinical Interview for DSM-IV-TR Axis I Disorders-Patient Edition SCID-I/P²⁷ was administered to diagnose psychiatric disorders as defined by the Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR.²⁸ The SCID-I/P is used to assess 45 different Axis I disorders, 33 of which are non-substance related disorders and 12 which are substance-related disorders (e.g. substance induced mood disorder). All

women in the study met diagnostic criteria for one or more psychoactive substance use disorders. Women who met criteria for any of the 33 non-substance related lifetime disorder comprised the comorbid group.

Demographics—Demographic information was also assessed, including participants' age, education, and racial/ethnic background. Age was left as a continuous variable while education and ethnicity were treated as categorical data distinguishing between those with and without a high school education or equivalent and White and non-white participants. Of the 51 women identified as non-white, forty-nine were African American, one was Asian, and one was Native American.

Data analysis

Analyses were performed using SPSS version 15.²⁹ Descriptive statistics, including counts and percentages for categorical data and means and standard deviations for continuous data were used to describe the sample. Values for tolerance ranged from .76–.95 and VIF ranged from 1.06–1.32 indicating that predictor variables were not highly correlated and did not violate the assumption of multicollinearity. Logistic regressions were also performed with each predictor tested both independently and simultaneously with the other three predictors in order to evaluate both unadjusted and adjusted models.

RESULTS

Sample Demographics

Participants were between 18–43 years of age (mean=31.5; SD: 6.0) and predominately African-American (59.3%) and white (37.0%). The majority did not have a high school education or equivalent (55.6%). All participants met diagnostic criteria for a psychoactive substance use disorder with nearly all (93.8%) having had a lifetime diagnosis of opiate and/or cocaine dependence. Table 1 shows the prevalence of lifetime substance use disorders. As shown, the most common lifetime substance use disorders were opioid (82.7%) and cocaine (71.6%) dependence. Forty-eight women (59.3%) also had a comorbid lifetime Axis I disorder. Thirty-eight women (46.9%) had a mood disorder, 36 women (44.4) had an anxiety disorder, 8 women (9.9%) had a psychotic disorder, 2 women (2.5%) had a somatoform disorder, and 5 women (6.2%) had an eating disorder. Of the 48 women with at least one comorbid lifetime disorder, 27 (56.3%) had both a mood and anxiety disorder during their lifetime.

The lifetime HIV risk behaviors in this sample were high with 47 women (58.0%) having traded sex during their lifetime and 25 (30.9%) having traded sex during the past 6 months. Additionally, 38 women (46.9%) had a lifetime history of IDU and 26 (32.1%) had a history of IDU during the past 6 months. Twenty-five women (30.9%) had a history of both IDU and trading sex during their lifetime. Eleven women (13.6%) had traded sex and had IDU during the past 6 months. Of the women with histories of having traded sex during the past 6 months, 32.0% were white, 56.0% had less than a high school education or equivalent, and 84.0% had a comorbid psychiatric diagnosis (see first column of Table 2). Among the women with histories of IDU during the past 6 months, 57.7% were white and 69.2% had a lifetime comorbid, non-substance related psychiatric diagnosis (see first column of Table 3).

Unadjusted Logistic Regressions

Age, ethnicity, education, and lifetime psychiatric comorbidity were first tested each as independent predictors of sex trade and IDU during the past 6 months. The results of these regressions are presented as the unadjusted odds ratios (OR) with 95% confidence intervals (CI) in Table 2 and Table 3. As shown in Table 2, age and lifetime psychiatric comorbidity

were statistically significant predictors of sex trade during the past 6 months. Older women (OR: 1.1; 95% CI=1.0, 1.2, $p<.05$) and women with lifetime psychiatric comorbidity (OR: 5.6; 95% CI=1.7, 18.6 $p<.01$) were more likely to have traded sex during the past 6 months in unadjusted models than women who were younger or without a comorbid non-substance related disorder during their lifetime, respectively. As shown in Table 3, white women were more likely to have injected drugs during the past 6 months (OR: 3.6; 95% CI=1.4, 9.7, $p<.05$) compared to women who were not white.

Multiple Simultaneous Logistic Regressions

Two simultaneous logistic regressions were performed with past 6 months sex trade and past 6 months IDU as outcome variables and age, ethnicity, education, and lifetime psychiatric comorbidity as predictors. The results of the simultaneous regression for sex trade and IDU during the past 6 months are presented as the adjusted odds ratios (AOR) with confidence intervals in Table 2 and Table 3. As shown in Table 2, psychiatric comorbidity was a statistically significant predictor of sex trade during the past 6 months. In the adjusted model, women with psychiatric comorbidity during their lifetime were 6 times more likely (AOR =6.0, 95% CI=1.7, 20.9, $p<.05$) to have traded sex during the previous 6 months compared to women without a lifetime comorbid psychiatric diagnosis. As shown in Table 3, white women were about three times more likely to have injected drugs during the previous 6 months (OR: 3.2; 95% CI=1.0, 9.8, $p=.05$) compared to women who were not white while adjusting for demographic and psychiatric comorbidity covariates. Age, education, and psychiatric comorbidity were not predictive of lifetime IDU.

DISCUSSION

This study adds to a growing body of literature on psychiatric comorbidity among pregnant women in drug treatment^{16, 19, 30} suggesting that (1) more than half of the pregnant women in drug treatment have a comorbid, non-substance related lifetime diagnosis and (2) pregnant women in drug treatment with psychiatric comorbidity have greater psychosocial problems and risk behaviors that compromise their health and functioning when compared to pregnant women without a comorbid disorder.^{16, 19, 30} Pregnant women with psychiatric comorbidity are more likely to report treatment barriers,¹⁹ post-treatment relapse,¹⁶ have a history of abuse³⁰ and suicide attempts,^{19, 30} and as evidenced by this study, engage in risk behaviors that may result in the transmission of HIV or other infectious diseases that further compromise the health of mothers and their unborn fetuses.

Psychiatric comorbidity in the present study sample (59.3%) was comparable to other studies examining lifetime prevalence of comorbid psychiatric disorders in national samples 41%–65%¹⁷, opioid abusers entering methadone 44%²⁰, and substance dependent pregnant women in treatment 51%.¹⁹ Therefore, the prevalence of comorbid non-substance related lifetime psychiatric comorbidity reported here is consistent with other studies, which together highlight that approximately half of all adults presenting to drug treatment have a history of other mental health problems to consider in addition to substance abuse, with some estimates suggesting 70% of pregnant women in drug treatment have a current, comorbid Axis I disorder.¹⁶

The present study suggests the presence of a comorbid psychiatric disorder likely places this subgroup of women at elevated infectious disease risk. The significance of the present study findings are further underscored because the 6 month interval for which sex trade behavior was assessed overlapped with the period during which women in the study were pregnant. Many of the infectious diseases for which drug dependent pregnant women with psychiatric comorbidity may be at elevated risk to contract by virtue of sex trade behavior have also been shown to adversely affect fetal health and birth outcomes. For example, women who

may contract HIV or a sexually transmitted infections during the course of their pregnancy risk passing those infections onto their child.³¹ While advances in infectious disease testing and treatment may reduce disease transmission of some infectious diseases, infectious disease treatments still pose health risks to both the mother and child.²¹ Additionally, women who are also drug dependent may exhibit higher rates of unintended pregnancy likely due in part to elevated rates of unprotected sex associated with drug use.

The present study findings with respect to sex trade are consistent with findings from other studies of drug dependent treatment seeking women which have linked mental health problems in the past year to lifetime sex trade.^{11, 12} However, we extend previous findings by measuring psychiatric comorbidity using a structured clinical interview,²⁷ which provides indication of diagnostic disorders as defined by the Diagnostic and Statistical Manual-IV.²⁸ Our finding suggests half of the pregnant women in drug treatment comprising our sample had a history of psychiatric comorbidity, which in itself was associated with recent sex trade. Therefore, a history of psychiatric comorbidity may be a key marker for infectious disease risk by virtue of high risk sexual behavior among pregnant women in drug treatment. Counter to our hypothesis, we did not find an association between lifetime psychiatric comorbidity and recent IDU among this sample of drug dependent pregnant women. Since the baseline prevalence of the injection drug risk behavior was nearly equal to rates of recent sex trade, our study findings suggest that mechanisms underlying distinct HIV risk behaviors among women likely vary with psychiatric comorbidity possibly accounting for variations in sexual risk behavior, but not injection drug risk behavior.

The study findings have direct relevance to the application of assessment and treatment strategies targeting psychiatric comorbidity among drug dependent pregnant women in treatment. Given the association of psychiatric comorbidity with recent HIV risk behaviors reported here and evidence linking mental health problems with increases in injection and sexual risk behaviors over time,¹³ there is a need to both assess and treat comorbid mental health problems among pregnant women presenting to drug treatment in order to reduce risk for HIV and other infectious diseases. While psychotherapy, pharmacotherapy, or a combination of the two have all been recommended to treat psychopathology,^{32, 33} the long-term effects of psychopharmacological treatments on neonatal outcomes remain unclear,³⁴ therefore, integrating nonpharmacologic interventions for treating depression³⁵ or anxiety, such as group therapy, may be most optimal interventions depending upon each woman's psychological condition and symptom severity. However, at the same time, other serious issues affecting women's mental health and risk for HIV and other infectious diseases including homelessness³ and violence² also need to be addressed in order to truly improve the health and functioning of this population of women.

The prevalence of HIV risk behaviors reported in the study also suggests the need to integrate HIV prevention interventions into drug dependence treatment for pregnant women, particularly those with a history of psychiatric comorbidity given their elevated risk for HIV and other infectious diseases by virtue of sex trade. Lifetime and 6 month rates of sex trade and IDU were prevalent in this sample. Nearly half of the women in our sample had engaged in sex trade or IDU during their lifetime and a third had engaged in sex trade or IDU during the past 6 months. These rates are 15–30 times greater than prevalence rates of these behaviors from national samples,^{36, 37} and other high risk populations, including severely mental ill adults with substance use disorders³⁸ or women in prison.³⁹ Preliminary evidence for integrating HIV prevention interventions into the substance abuse treatment for pregnant women shows some promising findings in terms of reduced risk,⁴⁰ yet more studies are needed to inform such prevention interventions.

The higher prevalence of lifetime IDU among white women compared to African American women was also consistent with findings from a sample of women in prison,³⁹ where lifetime IDU was 41.9% among whites compared to 14.5% for African-Americans. While our findings, in combination with McClelland and colleagues,³⁹ suggest lifetime IDU is higher among white women compared to women of color, more African American women than white women are becoming infected with HIV through IDU. At the end of 2005, 19,358 non-Hispanic Black women living with HIV were believed to have been infected via IDU compared to 8,120 non-Hispanic white women.⁴¹ When considered in light of extant empirical findings, the present study suggests that while African-American women may be less likely to have ever injected drugs compared to white women, they may be more likely to engage in IDU risk behaviors with people infected with HIV.

Strengths and limitations

While the findings reported here address gaps in the literature and extend knowledge, they should be interpreted within the context of important study limitations. Only HIV-negative women were recruited to participate in the study. Therefore it is unclear whether the relationships reported here would also be similar for HIV-positive pregnant drug dependent women in treatment. Future studies examining those relationships are warranted. Furthermore, it should be noted that the age of first and last sex trade for drugs was before the age of 18 for one fifth of our sample (21.6%), which could be an indication of childhood sexual abuse. Our study was limited by not assessing for this behavior and other childhood trauma which has been linked to HIV risk for women.⁴² Also, the span of some confidence intervals indicate some instability in the models due to small sample size. Given the nature of the sample, these findings also cannot be generalized to broader populations. Finally, while comorbidity examined here was characterized most notably by mood and/or anxiety disorders in combination with psychoactive substance use disorders, future studies should examine the relationships between specific types of non-substance related disorders and HIV risk behaviors as there may be unique relationships between psychiatric comorbidity and HIV risk behaviors that may inform HIV prevention interventions.

Despite these limitations, to our knowledge this is the first study examining whether lifetime psychiatric comorbidity may identify a particular group of pregnant women in drug treatment at risk for HIV and other infectious diseases. Although pregnant drug dependent women are a high risk population, there is a paucity of research examining HIV risk behaviors among them in part because they are a difficult population to engage in large numbers. In addition, our study population was predominately African American so we believe these findings have particular relevance to the growing rates of HIV among African-American women⁴³ and may serve to inform HIV prevention interventions targeting this high risk population in order to reduce HIV transmission rates. Furthermore, this study extends the body of literature examining mental health problems and HIV risk behavior among drug dependent women by assessing mental health disorders as defined by the Diagnostic and Statistical Manual-IV-TR²⁸ using a widely known and standardized assessment tool.²⁷

Conclusions

In summary, the findings reported here add to a developing body of literature regarding contextual factors related to HIV risk behaviors among urban, pregnant drug-dependent women, most of whom are ethnic minorities.⁴⁰ Our findings suggest pregnant women in drug treatment with lifetime comorbid non-substance related psychiatric disorders may be at particularly high risk for HIV and other infectious diseases; this population in our study was more likely to have traded sex during the past 6 months than pregnant women in drug treatment who did not have psychiatric comorbidity. Integrated HIV prevention

interventions into drug dependence treatment for pregnant women are needed. Furthermore, results from this study suggest integrating psychiatric assessment and substantive treatment for mental health issues among pregnant women in drug treatment may help to reduce risk for HIV and other infectious diseases among pregnant drug dependent women and their children.

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Table 1

Lifetime Substance Use Disorders (n = 81)

	N (%)
Opioid Dependence	67 (82.7)
Opioid Abuse	2 (2.5)
Cocaine Dependence	58 (71.6)
Cocaine Abuse	6 (7.4)
Alcohol Dependence	27 (33.3)
Alcohol Abuse	13 (16.0)
Cannabis Dependence	21 (25.9)
Cannabis Abuse	17 (21.0)
Other Substance Dependence Disorder	18 (22.2)
Other Substance Abuse Disorder	12 (14.8)

Table 2

Logistic regression model predicting sex trade during the past 6 months

	N (%) Sex Trade Past 6 Months	Unadjusted			Adjusted		
		Odds	95% Confidence Interval	Interval	Odds	95% Confidence Interval	Interval
Age							
Total	25 (30.9)	1.1*	1.0-1.2		1.1	1.0-1.2	
Ethnicity							
Not White	17 (68.0)	1.0	--		1.0	--	
White	8 (32.0)	0.7	0.3-2.0		0.8	0.2-2.9	
Education							
High School Graduate	11 (44.0)	1.0	--		1.0	--	
Not a High School Graduate	14 (56.0)	1.0	0.4-2.7		0.9	0.3-2.9	
Lifetime Comorbidity							
Absence	4 (16.0)	1.0	--		1.0	--	
Presence	21 (84.0)	5.6**	1.7-18.6		6.0*	1.7-20.9	

**
 $p < .01$ *
 $p < .05$

Table 3

Logistic regression model predicting IDU during past 6 months

	N (%) IDU Past 6 Months	Unadjusted		Adjusted	
		Odds	95% Confidence Interval	Odds	95% Confidence Interval
Age					
Total	26 (32.1)	1.0	0.9–1.0	1.0	0.9–1.1
Ethnicity					
Not White	11 (42.3)	1.0	--	1.0	--
White	15 (57.7)	3.6*	1.4–9.7	3.2†	1.0–9.8
Education					
High School Graduate	13 (50.0)	1.0	--	1.0	--
Not a High School Graduate	13 (50.0)	0.7	0.3–1.8	1.0	0.3–2.8
Lifetime Comorbidity					
Absence	8 (30.8)	1.0	--	1.0	--
Presence	18 (69.2)	1.9	0.7–5.0	1.6	0.6–4.6

* $p < .05$ † $p = .05$