Published in final edited form as:

J HIV AIDS Soc Serv. 2014 ; 13(4): 325–326. doi:10.1080/15381501.2014.964534.

Case Management: Steadfast Resource for Addressing Linkage to Care and Prevention with Hospitalized HIV-Infected Crack Users

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Abstract

Interviews were conducted among HIV-positive inpatients in Miami, Florida and Atlanta, Georgia to examine whether having a case manager was associated with improved outcomes. We explored whether current use of a case manager was associated with unprotected sex, HIV care, use of antiretroviral medications, and referral to case management at time of diagnosis. Outcomes among patients who received case management were compared to those without a case manager. Participants with a current case manager were significantly more likely to take HIV medications, have obtained HIV care within the past six months, and have been referred to case management when first diagnosed. They were also significantly less likely to engage in unprotected sex within the last six months. Interventions that link HIV positive patients with a case manager may improve HIV health-seeking behaviors and reduce sexual risk engagement which may lead to improved clinical results.

Keywords

HIV Case Management; Drug use among PLWH; HIV Care; ART Adherence

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Introduction

Scientific advances have presented compelling data demonstrating that antiretroviral therapy is perhaps our most important strategy to prevent transmission of HIV and to extend the lives of people living with HIV (PLWH) (Chesney, 2003; Cohen, 2012; Krüsi, 2010; Paterson, 2000). However, it has also been recognized that there is a continuum of care that requires people to first learn their HIV status, then get linked to outpatient HIV care, then initiate antiretroviral therapy, and finally be retained in care and adhere to antiretroviral therapy (Gardner, 2009; Gardner, 2011; Giordano, 2011; Osterberg, 2005; Stone, 2001; Tripathi, 2011). Unfortunately, it has been shown that most PLWH do not progress along this continuum and thus do not have optimal clinical outcomes (Gardner, 2009; Gardner, 2011; Tripathi, 2011). Furthermore, certain populations of PLWH, such as crack users, face additional barriers that limit healthcare access and increase the risk for poor health outcomes (Brewer et al., 2007).

Studies have found that crack use deters PLWH from initiating HIV care, and is an independent risk factor for poor sexual health outcomes (Brewer, 2007; Edlin, 1994; Wilson, 1998). Even among crack users who are able to begin HIV treatment, the chaotic pace of the crack high combined with the lack of a legal substitute (such as methadone for heroin addicts), makes it difficult for this population to continuously access HIV care, which requires substantial planning (Brewer et al., 2007). In addition, unprotected sex with multiple partners, exchanging sex for drugs, and sexual interactions with injection drug users are characteristic behaviors of crack users that increase the risk for suboptimal health (Rudolph et al., 2013).

PLWH who are lost across the continuum of care are in need of multilevel interventions to increase initiation of, retention in, and often re-engagement in HIV care. A critical resource since the beginning of the HIV/AIDS epidemic in the United States and worldwide is case management (Centers for Disease Control and Prevention and Health Resources and Services Administration [CDC], 2008). Ryan White is the largest federally-funded case management provider for HIV-infected populations in the U.S., but many other programs also provide for case management services (CDC, 2008).

Among the general population of PLWH in the United States, case management has been shown to promote linkage to, and retention in, HIV treatment, increase health insurance status, reduce total costs of providing services to PLWH, and improve adherence to highly active antiretroviral therapy (HAART) and clinical outcomes (Craw, 2008; Gardner, 2005; Husbands, 2007; Javanbakht, 2006; Katz, 2001; Kushel, 2006; Lo, 2002; Messeri, 2002; Sherer, 2002;). However, less research has been conducted on PLWH who are not engaged in care and frequently rotate in and out of hospital/in-patient settings, such as crack users. Unfortunately, these individuals are at increased risk of having unmet needs for services directed towards mental health, substance use needs and homelessness (Bell, 2010; Buchanan, 2009; Metsch, 2009). They are also less likely to be receiving antiretroviral therapy and engaging in prevention practices (Bell, 2010; Metsch, 2009). While recent research has documented the myriad of problems and challenges facing this often forgotten population of PLWH in the era of antiretroviral therapy, there have been few investigations

into the resources available to such individuals, such as case management services. Within this context, we interviewed hospitalized HIV-positive patients who use crack in two urban U.S. cities and examined whether having a case manager was associated with improved HIV care and prevention outcomes.

Methods

Between 2006 and 2007, 413 in-patients in Miami, Florida and Atlanta Georgia were interviewed at bedside after providing informed consent as part of the baseline assessment for Project HOPE (**H**ospital visit is an **O**pportunity for **P**revention and **E**ngagement) (Metsch, 2009). Eligible participants met the following criteria: 1) 18 years of age or older, 2) self-identify as HIV-seropositive, 3) confirmed as HIV seropositive through chart abstraction, 4) self-report being sexually active (engaging in anal or vaginal sex) within the last 6 months, 5) having used crack cocaine more than once per week for the past 30 days, 6) self-report not having injected drugs in the past 12 months, 7) currently an inpatient at one of the two study sites, 8) willing to provide basic contact information for follow-up, and 9) fluent in English or fluent in Spanish, but capable of communicating in English. Using paper questionnaires, a research assistant read each question to each participant and recorded each response. This information was then entered into a password protected database. Prior to data analysis, the database and questionnaires were compared and data entry was reviewed for accuracy by another research assistant. This study was approved by the Institutional Review Boards at both the University of Miami and Emory University as well as the hospital oversight committees at Jackson Memorial Hospital and Grady Memorial Hospital. The study is also registered in [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT00447798) (NCT00447798).

Measures

Demographic characteristics are presented in Table 1. CD4 count was abstracted from medical records. As a CD4 count of <200 is commonly associated with more advanced HIV disease, a dichotomous variable was created (<200, ≥200) to reflect HIV health status. Years since HIV diagnosis was calculated from self reported month and year of diagnosis. Self-reported alcohol use was measured as 5 or more drinks per day in the past 6 months (yes, no) and participants were also queried about crack use in the past six months (yes, no). As the present study sought to understand the impact of case management on HIV outcomes, we added case management questions to the original baseline assessment and 299 participants were asked whether they were referred to a case manager when first diagnosed with HIV (yes, no) and whether they currently have a case manager (yes, no).

The dependent variables examined were having seen an HIV provider in the past six months (yes, no), currently taking HIV medications (yes, no), and having engaged in sexual risk behaviors in the past six months (defined as having had unprotected sex with any partner and having had unprotected sex with a partner whose HIV status was negative or unknown (yes, no)). According to the continuum of care for PLWH, individuals cycle through six different stages of HIV care at variable rates depending on their unique circumstances (Cheever, 2007; Health Resources and Services Administration [HRSA], 2010). The first three stages focus on individuals learning their HIV status and do not involve receipt of HIV

care (Cheever, 2007; HRSA, 2010). Initiating HIV care, sporadic use of HIV care, and full engagement in HIV care are the latter three stages on the continuum of care for PLWH (Cheever, 2007; HRSA, 2010). To determine the impact of case management on these latter stages involving HIV care, we queried whether participants had seen an HIV provider within the last six months.

The main independent variable was whether participants currently reported having a HIV case manager (yes, no). Associations between demographic characteristics, independent variables, and dependent variables are also presented in Table 1.

Data Analysis

Chi-squared tests of independence were used to evaluate the associations and statistical significance, set at $\alpha=0.05$ (Table 1). Multivariable logistic regressions were used to test the association between whether participants "Currently has an HIV case manager" and each dependent variable, adjusting for age, gender, educational level, ethnicity, years since diagnosis, and CD4 count (Table 2). SAS version 9.1.3 was used for statistical analysis.

Results

Study Population Characteristics

Fifty-two percent of the study participants were female and the majority of study participants were African American (87%). The mean age was 45 years of age. Fifty-nine percent had annual incomes of less than \$5,000, 76% had a history of homelessness, and 24% reported five or more drinks of alcohol in a day in the past 6 months. On average, patients had received their HIV diagnosis 10 years ago and had been using crack for 18.6 years. Half of all participants (49% of males and 51% of females) had a case manager at the time of their initial HIV diagnosis. One fifth of the sample had never visited an HIV primary care provider, and 47% had not seen an HIV primary care provider in the previous six months. Less than one third (31%) were taking antiretroviral therapy, 89% reported engaging in unprotected sex within the prior six months and 30% had unprotected sex with an HIV-negative or unknown status partner within the prior six months. Approximately half of the study participants currently had a case manager. (Table 1)

Associations with Case Management

As shown in Table 2, participants who had a case manager at the time of the study interview were significantly more likely to have been referred to case management when first diagnosed with HIV, take HIV medications, and had received HIV care within the past six months of the study interview. They were also significantly less likely to engage in unprotected sex within the last six months with anyone, including an HIV negative or unknown serostatus partner.

Participants who had a case manager when first diagnosed with HIV were significantly more likely to currently have a case manager and obtain HIV care within the past six months. They were also more likely to currently take HIV medications, and less likely to have

unprotected sex within the past six months, although these differences were not significant compared to those who did not have a case manager when first diagnosed.

Unprotected Sex with HIV-Negative or Unknown Serostatus Partner

The adjusted odds of having unprotected sex with a partner of unknown serostatus were 60% lower among those with a case manager. The adjusted odds for having unprotected sex with an HIV-negative partner or of unknown serostatus were 60% lower among those diagnosed between 10–16 years ago than those diagnosed less than 2 years ago. The adjusted odds for females having unprotected intercourse with an HIV-negative partner or of unknown status were three times greater than males. (Table 2)

Use of HIV Care and Antiretroviral Therapy

Participants with a current case manager had a 7.3 times higher adjusted odds of having seen an HIV provider in the last six months and 3.3 times higher adjusted odds for using antiretroviral therapy. (Table 2)

Discussion

Our results show that current use of a case manager is positively associated with HIV prevention and care practices. Among our sample, current use of a case manager was significantly associated with positive health behaviors such as use of ART and receipt of HIV care in the previous six months. Having a case manager was also associated with reduced sex risk behaviors.

Even when participants did not currently have a case manager, we found that referral to a case manager when first diagnosed with HIV was also associated with improved health behaviors at the time of the study. Those who had a case manager when initially diagnosed were more likely to be currently taking HIV medications and receiving recent HIV care. As funding for the Ryan White program and other health policies are reassessed during the implementation of the Affordable Care Act, the positive correlation between case management and sustaining a beneficial healthcare regimen among PLWH should be considered.

While prior research has examined case management among PLWH, our study extends previous work by exploring potential associations between case management and sex risk behaviors in a unique population of crack-using PLWH recruited from the in-patient setting (Craw, 2008; Gardner, 2005; Katz, 2001; Lo, 2002; Messeri, 2002; Metsch, 2009; Sherer, 2002). Previous studies have either examined case management in conjunction with other services, such as counseling and prevention interventions, or has examined the effects of case management only on HIV risk behaviors among specific populations, such as prisoners and PLWH outside of the United States (Gasirowicz, 2005; Johnson, 2008; Johnson, 2010; Joseph, 2010; Ko, 2011; Luchters, 2008; Robles, 2004; Sarna, 2012; Schumann, 2007). These previous studies report conflicting results; some show reduced risk behaviors and others found no change in risk behaviors. As a clinically important percentage of PLWH in the United States engage in risky sexual behaviors despite knowledge of their HIV status,

implementing interventions to reduce such behaviors is important (Blair, 2011; Crepaz, 2006; Ko, 2011).

Prior research advocates for continuous case management, and it is possible that outcomes are better among patients who use a case manager continuously. Our findings also support this, as participants who had a case manager when first diagnosed were significantly more likely to currently have a case manager as well as improved outcomes. However, stable housing is difficult for many PLWH to obtain, which is a barrier to maintaining a continuous relationship with a case manager (Leaver, 2007). In addition, groups with a higher prevalence of HIV, such as homeless persons and drug users, are more likely than the general population to have difficulties sustaining a continuous relationship with one case manager (Centers for Disease Control and Prevention (CDC), 2012; Kidder, 2008; Mathers, 2008; Robertson, 2004). Importantly, our results also reflect that those who had a case manager when first diagnosed did achieve better outcomes, even if they did not have a current case manager. Therefore, our findings support that any interaction with a case manager may have lasting positive effects, even when a continuous relationship is not maintained.

Current guidelines advocate for brief case management for patients with new HIV diagnoses and for case management for homeless individuals and youth, but do not comment on the use of case management for other populations of PLWH and when it should be employed (Thompson, 2012). Regardless of when case management is delivered and whether it is continuous, our results show that having a current case manager may reduce sex risk, improve HAART adherence, and increase the likelihood of receiving care from an HIV provider. Thus, our outcomes suggest that case management delivered at any time can help PLWH progress along the continuum of HIV care (HRSA, 2010).

Limitations of this study include the retrospective design; as responses to the survey were dependent on patient's memory, recall bias may have affected the results. Prior research has found that the accuracy of self-reported data from drug users depends on specific subject characteristics, including types of drugs used by the sample (Hser, 1997). Studies that compared self-report data from crack users to their urinalysis results found that about half of the users who tested positive for drugs admitted to using drugs (Lu, 2001). Thus, it is possible that our sample also did not provide the most accurate responses to assessments. To improve the accuracy of self-report data from crack users in future studies, clinical measures should be employed to verify self-report data whenever possible.

Another limitation of our study is that the case management services delivered to patients were not described in detail. Research shows that many PLWH have multiple case managers who address specific needs; therefore, identifying which services are most efficacious is important (CDC, 2008).

Though research has found crack use inhibits healthcare access, it must be noted that all of our participants were receiving healthcare at the time of the study, which could have impacted their responses to assessments (Cunningham, 2006; Metsch, 1999). As studies have shown that participating in substance abuse treatment may increase access to HIV care

among drug users, it is also possible that participants were prompted to seek medical care as a result of participating in other health and social support programs, such as shelters, food banks, or substance abuse programs (Knowlton, 2001; Messeri, 2002). Since we did not collect comparative data from crack users who were not hospitalized, we were unable to determine the impact of hospitalization on outcomes. Lastly, all patients were from one of two large urban cities; therefore, our findings may not be applicable to rural populations and other areas in the U.S.

In conclusion, our findings show that HIV outcomes improve among PLWH when a case manager is involved in patient care. Given the growing focus in the U.S. on employing cost-effective healthcare strategies, it is important to identify efficient aspects of caring for PLWH, especially since Ryan White, the largest service provider for HIV care is federally funded. Previous research advocates for developing specific strategies to engage crack users into HIV care (Brewer et al., 2007). In addition to healthcare access, such interventions should address the multiple factors that impact outcomes in this population, including sexual risk behaviors, drug treatment, homelessness, and employment (Brewer et al., 2007).

Though significant advances, such as needle exchange programs, have been made to reduce health risks among injection drug users with HIV, few resources address the specific health risks of crack users with HIV. At a time when healthcare is being reformed to provide coverage for the masses, it is critically important to consider the comprehensive needs of this vulnerable population. Improving access to HIV care among crack users has been reported to increase participation in drug treatment programs (Brewer et al., 2007). An important benefit of drug treatment among crack users is reduced sexual risk behaviors (McCusker, 1993; Shoptaw, 1997). Within this context, it is crucial that federally funded health programs for PLWH include mechanisms to access additional social services, such as substance abuse treatment and other support that directly impacts health outcomes.

Our study adds to the growing body of evidence that demonstrates the benefits of case management for PLWH. This knowledge may be used to develop comprehensive models of care that include case managers as an integral aspect to increase HAART adherence, improve health-seeking behaviors, and reduce sex risk among PLWH.

Acknowledgements

We would like to extend our deepest gratitude to Mr. Ikenna Okoro, who provided valuable technical support to make this manuscript possible. This study was made possible through a National Institute on Drug Abuse grant: Project HOPE: Prevention Among HIV+ Crack Users in the Hospital (R01 DA017612 -01A2)

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Table 1
Demographic characteristics of “Currently Have A Case Manager” and “Referred To A Case Manager When First Diagnosed with HIV”

Demographic Characteristics	Total		Currently Have a Case Manager		Referred to a Case Manager When First Diagnosed with HIV	
	n	% ^a	n	% ^a	n	% ^a
Age	18–34 years old	22 (8.2)	10	(7.6)	19	(10.3)
	35–44 years old	106 (39.4)	52	(39.4)	73	(39.7)
	45–54 years old	113 (42.0)	59	(44.7)	75	(40.8)
Gender	55 years old	28 (10.4)	11	(8.3)	17	(9.2)
	Male	145 (48.5)	78	(52.0)	102	(48.8)
	Female	154 (51.5)	72	(48.0)	107	(51.2)
Race/Ethnicity	Hispanic	11 (3.7)	7	(4.7)	7	(3.4)
	African-Amer.	260 (87.5)	131	(87.3)	189	(90.9)
	White	20 (6.7)	9	(6.0)	8	(3.8)
Marital Status	Other	6 (2.0)	3	(2.0)	4	(1.9)
	Single, Never married	195 (65.2)	101	(67.3)	141	(67.5)
	Divorced, Widowed, Separated	81 (27.1)	37	(24.7)	50	(23.9)
Income	Married or Common Law	23 (7.7)	12	(8.0)	18	(8.6)
	\$0 to \$5000	178 (60.5)	87	(58.0)	140	(68.3)
	\$5,001 or more	116 (39.5)	63	(42.0)	65	(31.7)
Years Diagnosed with HIV	2 yrs or less	62 (20.7)	26	(17.7)	49	(25.5)
	> 2 yrs to < 10 yrs	65 (21.7)	34	(23.1)	50	(26.0)
	10 yrs to < 16 yrs	77 (25.8)	38	(25.9)	53	(27.6)
Currently have case manager	16 yrs or more	82 (27.4)	49	(33.3)	40	(20.8)
	No	149 (49.8)	-	-	63	(43.4)*
	Yes	150 (50.2)	-	-	82	(56.6)*
Referred to a case manager when first diagnosed HIV+	No	152 (50.8)	67	(45.0)*	-	-
	Yes	145 (48.5)	82	(55.0)*	-	-

Note. Column percents.

* Statistically significant at $\alpha=0.05$.

Table 2

Demographic characteristics and their association with “Currently Taking HIV Medications”, “Unprotected Sex”, and “Attended HIV Care In The Past Six Months”.

Demographic Characteristics		Total		Currently Taking HIV Medications		Unprotected Sex with HIV-Negative Or Unknown Sero-Status Partner		Unprotected Sex In Past Six Months		HIV Care In Past Six Months	
		n	% ^a	n	% ^a	n	% ^a	n	% ^a	n	% ^a
Age	18–34 years old	22	(8.2)	7	(31.8)	8	(36.4)	20	(90.9)	7	(35.0)
	35–44 years old	106	(39.4)	28	(26.4)	33	(31.1)	93	(87.7)	39	(41.1)
	45–54 years old	113	(42.0)	38	(33.6)	33	(29.2)	98	(86.7)	59	(56.7)
	55 years old	28	(10.4)	7	(25.0)	6	(21.4)	25	(89.3)	9	(36.0)
Gender	Male	145	(48.5)	52	(35.9)	33	(22.8)*	115	(79.3)*	67	(51.1)
	Female	154	(51.5)	40	(26.0)	56	(36.4)*	147	(95.5)*	63	(45.0)
Race/Ethnicity	Hispanic	11	(3.7)	6	(54.5)*	3	(27.3)*	8	(72.7)	7	(63.6)
	African-Amer.	260	(87.5)	84	(32.3)*	71	(27.3)*	229	(88.1)	113	(48.5)
	White	20	(6.7)	0	(0.0)*	12	(60.0)*	17	(85.0)	8	(40.0)
Income	Other	6	(2.0)	2	(33.3)*	3	(50.0)*	6	(100.0)	2	(40.0)
	\$0 to \$5000	178	(60.5)	48	(27.0)	59	(33.1)	158	(88.8)	66	(40.5)*
Ever homeless	\$5,001 or more	116	(39.5)	43	(36.8)	30	(25.6)	100	(85.5)	63	(60.6)*
	No	71	(23.9)	28	(39.4)	12	(16.9)*	56	(78.9)*	41	(60.3)*
Years Diagnosed with HIV	Yes	226	(76.1)	64	(28.3)	77	(34.1)*	204	(90.3)*	89	(44.3)*
	2 yrs or less	62	(20.7)	14	(22.6)	28	(45.2)*	60	(96.8)	22	(37.3)
	> 2 yrs to < 10 yrs	65	(21.7)	17	(26.2)	15	(23.1)*	57	(87.7)	27	(45.8)
	10 yrs to < 16 yrs	77	(25.8)	28	(36.4)	16	(20.8)*	63	(81.8)	34	(50.7)
Currently have case manager	16 yrs or more	82	(27.4)	31	(37.8)	24	(29.3)*	71	(86.6)	44	(57.9)
	No	149	(49.8)	25	(16.8)*	55	(36.9)*	140	(94.0)*	32	(24.2)*
Referred to a case manager when first diagnosed HIV+	Yes	150	(50.2)	67	(44.7)*	34	(22.7)*	122	(81.3)*	98	(70.5)*
	No	152	(50.8)	39	(25.7)	46	(30.3)	135	(88.8)	57	(41.3)*
	Yes	145	(48.5)	52	(35.9)	43	(29.7)	126	(86.9)	71	(54.2)*

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Note. Row percents.

+ N=249.

* Statistically significant at $\alpha=0.05$.