

Florida/Caribbean
AETC
AIDS EDUCATION AND TRAINING CENTER


19th Annual HIV CONFERENCE

May 14-15, 2010 • Orlando, FL

Hospitalized Patients Living with HIV in the Era of HAART: The impact of drug abuse in HIV infection in Florida

Allan E Rodriguez MD
*Associate Professor of Medicine
Division of Infectious Diseases
University of Miami*

arodriguez2@med.miami.edu



Florida/Caribbean
AETC
AIDS EDUCATION AND TRAINING CENTER

Disclosure of Financial Relationships

This speaker has no significant financial relationships with commercial entities to disclose.

This slide set has been peer-reviewed to ensure that there are no conflicts of interest represented in the presentation.



AETC 19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Living with HIV in 2010



The advent of HAART therapy in 1996 dramatically decreased mortality from HIV and transformed it from a fatal to a chronic disease

Average life expectancy after HIV diagnosis increased from 10.5 to 22.5 years from 1996 – 2005 (Harrison et al., 2010).



However, there are still about one in four people living with HIV that are not connected to HIV primary medical care



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Clinical Observations...

- **There are four groups of HIV-positive patients:**
 - Those who don't know that they are infected
 - Those who are in regular care
 - Those who are intermittently in care
 - Those who are not in care
- Among the last two groups are many patients who cycle in and out of the hospital – “Frequent Fliers”
- The reasons why these patients fail to enter care are many but crack cocaine is viewed as a major contributing factor



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Cost Considerations

- **Cost of HAART therapy for one year in U.S.=**
- **\$12,000 - \$15,000**

- **Cost of average hospital stay for HIV+ persons = \$15,000**



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

A snapshot of Our Wards...

U. Miami/Jackson Memorial Hospital (JMH):

- **~900 unique patients seen in the HIV inpatient service per year. Represent ~ 1500 HIV related admissions**

- **~41% are female**

- **~78% are Black (57% US Born blacks;15% Haitians); 22% White (16% Hispanics)**


- **~35-40% are crack users**

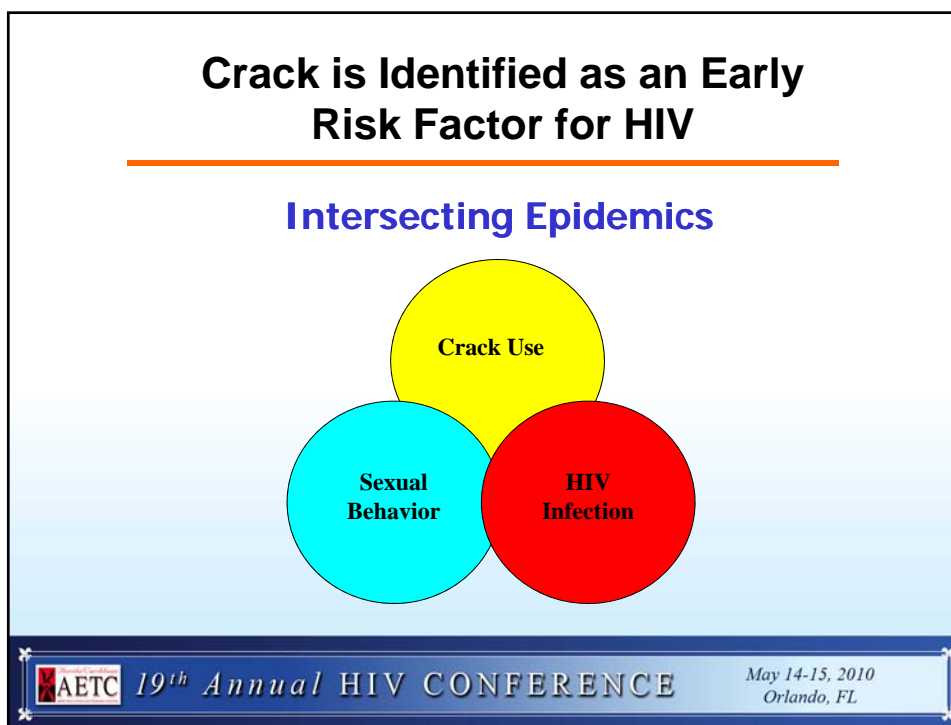


19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

<u>Overview of Hospital Admissions</u>	Haitian Born Blacks (N=133)	US- Born Blacks (N=502)
Male	66.2%	53.2%
Female	33.8%	46.8%
Substance Abuse (self report)	8.4%	51.6%
Substance Abuse -Negative Drug of Abuse Screen (DAU) 20.3% of Haitians tested 49.6% of US Born Blacks tested	88.9%	33.3%
Date of HIV Diagnosis < One Year	30.8%	15.9%
Date of HIV Diagnosis > 8 Years	15.0%	34.9%
CD4 < 200 cells mm3	79.7%	69.3%
CD4 < 50 cells mm3	52.6%	37.1%
Hepatitis C Diagnosis	2.3%	19.3%


19th Annual HIV CONFERENCE
May 14-15, 2010
Orlando, FL



Factors Associated with Crack Use

- Sexual Risk Behaviors including sex trading behaviors
- HIV and Other STDs
- Unemployment
- Domestic Violence
- Mental Health Problems
- Homelessness
- Rape
- Criminal Involvement
- Child Neglect
- “Survival Sex”



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Master Role of the Addict

- Symbolic interaction
- User takes on the master role of addict
- Puts drug use ahead of other needs
- Developed with heroin users

Stephens, R.C. (1991) Street Addict Role: A Theory of Heroin Addiction. SUNY Press: New York)



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

HIV-Infected Drug Users

- **HIV-infected Crack cocaine smokers and other hardcore drug users were less likely to utilize HIV primary care and HAART**
 - Strathdee et al., 1998; JAMA
 - Celentano et al., 1998; JAMA
 - Knowlton et al., 2001 Drug and Alcohol Dependence
 - Metsch et al., 2001; Journal of Substance Abuse
- **HIV-infected Drug Users are more likely to be hospitalized and have longer hospital stays than non-drug users**
 - Laine et al., 2001; JAMA
 - Pulvirenti et al., 2003; AIDS Patient Care STDS
 - Sherer et al., 2002; Journal of the International Association of Physicians in AIDS Care



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

CONNECTING TO CARE

Efficacy of a brief case management intervention to link recently diagnosed HIV-infected persons to care

Lytt I. Gardner^a, Lisa R. Metsch^b, Pamela Anderson-Mahoney^c, Anita M. Loughlin^d, Carlos del Rio^e, Stefanie Strathdee^d, Stephanie L. Sansom^b, Harvey A. Siegal^{f,1}, Alan E. Greenberg^a, Scott D. Holmberg^a and the Antiretroviral Treatment and Access Study (ARTAS) Study Group*

Objective: The Antiretroviral Treatment Access Study (ARTAS) assessed a case management intervention to improve linkage to care for persons recently receiving an HIV diagnosis.

Methods: Participants were recently diagnosed HIV-infected persons in Atlanta, Baltimore, Los Angeles and Miami. They were randomized to either standard of care (SOC) passive referral or case management (CM) for linkage to nearby HIV clinics. The SOC arm received information about HIV and local care resources; the CM intervention arm included up to five contacts with a case manager over a 90-day period. The outcome measure was self-reported attendance at an HIV care clinic at least twice over a 12-month period.

Results: A higher proportion of the 136 case-managed participants than the 137 SOC participants visited an HIV clinician at least once within 6 months (78 versus 60%; adjusted relative risk (RR_{adj}), 1.36; $P = 0.0005$) and at least twice within 12 months (64 versus 49%; RR_{adj}, 1.41; $P = 0.006$). Individuals older than 40 years, Hispanic participants, individuals enrolled within 6 months of an HIV-seropositive test result and participants without recent crack cocaine use were all significantly more likely to have made two visits to an HIV care provider. We estimate the cost of such case management to be US\$ 600–1200 per client.

Conclusion: A brief intervention by a case manager was associated with a significantly higher rate of successful linkage to HIV care. Brief case management is an affordable and effective resource that can be offered to HIV-infected clients soon after their HIV diagnosis.

© 2005 Lippincott Williams & Wilkins

AIDS 2005, 19:423–431

Initiating HIV Care: Attitudes and Perceptions of HIV Positive Crack Cocaine Users

Toye H. Brewer · Wei Zhao · Margaret Pereyra · Carlos del Rio · Anita Loughlin · Pamela Anderson-Mahoney · Lytt Gardner · Lisa R. Metsch · for the ARTAS Study Group

Crack cocaine use and male gender were negatively associated with initiating HIV care.

Exploring the Hospital Setting

- Patients in the hospital HIV wards are often unconnected to care
- Patients often have very high viral loads and may be engaged in unprotected sex or needle sharing as outpatients
- The hospital stay may provide a “teachable moment” during which patients may be open to enrolling in behavioral interventions



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Transmission

- **Since HIV hospitalized patients are more likely to have advanced disease and high viral loads, they are also at increased risk of transmission to their sero-negative partners**

Quinn TCW, Maria J; Sewankambo, Nelson, et al. Viral Load and Heterosexual Transmission of Human Immunodeficiency Virus Type 1. N Engl J Med 2000;342:921-9.



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Insight of impact of drug use in HIV **Project HOPE: Hospital Visit is an Oppportunity for Prevention and Engagement with HIV-positive Crack Users**

NIDA funded: 6/1/05 – 5/31/10

Grant No.: R01 DA017612



Grady Memorial Hospital

Jackson Memorial Hospital

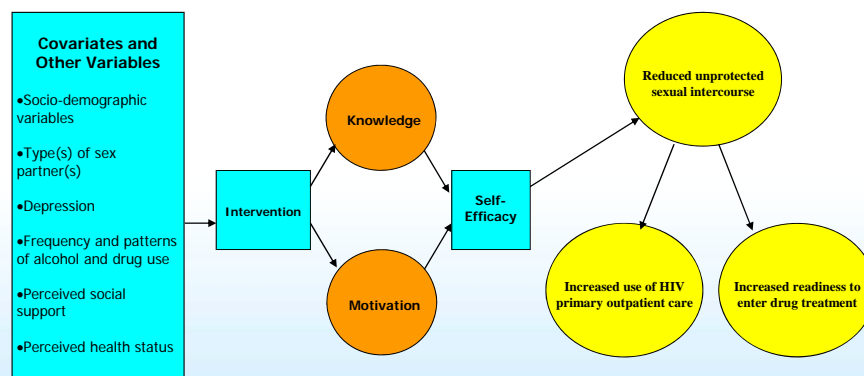


Overview of Study Design

- **2-arm prospective trial** comparing *The Prevention Care Advocate* (PCA) intervention to standard of care
- **PCA intervention:** 8 sessions conducted over a 6-week timeframe
 - ✓ 4 group sessions (2 hours each)
 - ✓ 3 individual sessions (1 hour each)
 - ✓ 1 prevention/care advocate activity (2 hours).
- **Data collection:** via HAPI (Handheld Assisted Personal Interview) and medical record abstraction
- **Follow people for one year**
- **Screening for sexually transmitted disease**
- **Assessment of CD4 and viral load over time**



Conceptual Model: PCA Intervention



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Target Population

- Sample size: 400
- Target Population: low-income, HIV (+) crack users
- Inclusion Criteria:
 - ≥ 18 yrs
 - Self-identify as HIV (+) and confirmed HIV (+) via chart abstraction
 - Self-report as being sexually active (anal or vaginal sex) w/in the last 6mo
 - Self-report as having used crack cocaine at least 1 time in past 12 months
 - Currently an inpatient at 1 of the 2 study sites



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Trial Screening Data

- **Screening conducted with admissions to HIV wards at Jackson and Grady Memorial Hospitals**
 - Began June, 2006 in Atlanta
 - Began August, 2006 in Miami
- **Screening is anonymous and verbal consent is provided**
- **Screening is conducted at bedside and interviewers collect data on handheld interviewer device**
- **\$5 monetary incentive provided for screening**



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Screening Participant Characteristics (n=3037)

- **3,166 screenings completed in 2 hospitals [3037 (95.9%) knew they were positive]**
 - 65% Male
 - 81% Black, Non-Hispanic
 - 7% Hispanic
 - 8% White, Non-Hispanic
 - 4% Other
 - Median Age is 44.7
 - HIV diagnosis: < 5 yrs (30%), 5-12 yrs (39%), 12+ yrs (31%)



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

What are the demographics? (n=3037)

- 39% did not graduate high school
- 46% have incomes less than \$5,000
- 57% reported living in non-stable housing,
 - 18% homeless or in a shelter
- 17% report daily care of children < 18 years of age



Screening Data: (N=3037)

- 20% have NEVER seen an HIV primary care provider
- 57% are currently NOT on HIV medications
- 38% have NOT seen an HIV primary care provider in the past 6 months
- 42% report having sex in the past 6 months
- 17% self-report having unprotected sex
 - 10.6% with HIV-negative or unknown status partner
- 27% report having used crack cocaine in the past 6 months
- 31% report heavy alcohol use in the past 6 months (enough alcohol to get buzzed)



Role of Crack Cocaine Use

	Crack Users	Non Users
	N=816	N=2207
Annual Income < \$5000	65.3%	39.3%
Never in HIV Care	26.7%	16.8%
No HIV Primary Care in past 6 month	54.5%	32.4%
Currently taking HIV meds	32.0%	47.4%
Heavy Alcohol Use in past 6 months	48.0%	24.2%
Sex in past 6 months	53.1%	37.7%
Unprotected sex with negative or unknown serostatus partner	15.9%	8.6%



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Role of Heavy Alcohol Use

	Heavy Alcohol in prior 6 months	No Heavy Alcohol Use in prior 6 months
	N=929	N=2096
Annual Income < \$5000	48.5%	45.4%
Never in HIV Care	24.1%	17.4%
No HIV Primary Care in past 6 month	47.9%	34.0%
Currently taking HIV meds	33.6%	47.5%
Crack Use in past 6 months	42.4%	20.2%
Sex in past 6 months	51.8%	37.5%
Unprotected sex with negative or unknown serostatus partner	14.3%	9.1%



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

HOPE Baseline Data

- Randomized Trial began in August, 2006
- Eligible participants: hospitalized HIV positive patients – sexually active (in past 6 months and used crack in past year)
- Baseline interviews are conducted at bedside and the interviewers collect data on handheld devices
- \$25 monetary incentive provided for baseline interview
- Interview takes approximately 1 hour and focuses on demographic, sexual and drug use risk behavior, HIV care utilization, readiness for drug treatment and their correlates



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Some clinical facts: Crack Users

- 47% screened positive for depression (BSI)
- CD4 median was 176
- Viral load median was 29,500



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Crack Use and HIV Care and Treatment

- **21% NEVER have seen an HIV primary care provider**
 - 34% said they have been putting it off, 27% didn't want to deal with it, 19% felt no symptoms, 12% didn't know where to go
- **51% said when they were first diagnosed they were referred to a case manager**
- **72% are currently NOT on HIV medications**
- **51% have NOT seen an HIV primary care provider in the past 6 months**
- **An average of 2 hospitalizations in past 6 months**



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Tell us about their crack use

- **Used crack on average for 18 years**
- **34% weren't able to pay bills to pay for crack**
- **51% were eating less than thought they should to pay for crack**
- **They know 10 people (median) they can buy crack from**
- **37% get money from friends to pay, 24% trade sex, 24% get money from family, 16% hustle, 15% sell possessions, 11% steal**
- **76% were using crack before learning they were positive, 45% said they used more crack after learning their status**



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Tell us about their crack use

- **Used crack on average for 18 years**
- **Due to the cost of their crack habit:**
 - 34% weren't able to pay their routine bills
 - 51% were eating less than thought they should
- **They know 10 people (median) from which they can buy crack and the money comes from:**
 - 37% from friends, 24% trade family, 24% trade sex, 16% hustle, 15% sell possessions, 11% steal
- **76% were using crack before learning they were positive, 45% said they used more crack after learning their diagnosis.**



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Managing Crack Cocaine Use

- **50% believe their drug use is under control**
- **80% say they are ready to quit drugs now**
- **53% believe they can solve their problems without drug treatment**
- **81% believe drug use is causing problems with their health**
- **17% of participants had been in drug treatment in past 6 months (66% have ever been in drug treatment)**



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Week before being admitted

- Used crack on average 2.5 times a day (max was 50 times)
- Used an average of 12 rocks in past week (max was 5900)
- Spent on average \$45 on crack (max was \$980)
- 50% do not currently have case manager
- 72% are currently not taking medicine for HIV
- 40% slept in a shelter, street or park



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

What about sex?

- 41% had more than one sex partner in the past 6 months
- 24.9% had a trade partner in the past 6 months
- 52.7% had either a casual or a trade partner in the past 6 months
- 72.8% had sex with an HIV negative or unknown status partner in the past 6 months
- 28.8% had UNPROTECTED sex with negative or unknown status partner in the past 6 months



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

CLINICAL SCIENCE

Never in Care: Characteristics of HIV-Infected Crack Cocaine Users in 2 US Cities Who Have Never Been to Outpatient HIV Care

Christina Ball, MPH,* Lisa R. Metch, PhD,† Nicholas Tegenhaler, MD, MPH,‡
Gabriel Cardenas, MPH,§ Allan Rodriguez, MD,† Virginia Lovato, LPTC,¶
Tony Kuper, BS,† Elizabeth Schatz, BS,† Alonzo Martinez, BA,†
Mary Johnson, MPH, MPH,† and Carlos del Rio, MD,*

Background: There are very limited data available on the characteristics of HIV-infected crack users who have never been to HIV care.

Methods: Interviews were conducted at hospitals with HIV-infected crack users who were recruited from the medical wards at Jackson Memorial Hospital in Miami, FL, and Grady Memorial Hospital in Atlanta, GA. Interviews assessed socio-demographic characteristics, drug use, diagnosed treatment history, use of HIV care, perceived social support, and mental health status. Multiple logistic regression was performed to identify factors associated with never having been to HIV care.

Results: Among 355 study participants, 17% reported never having been to a doctor or clinic for HIV care. Higher adjusted odds of never having been to care were associated with an annual income of less than \$3000 (adjusted odds ratio [AOR] = 8.17, 95% confidence interval [CI] = 1.93 to 35.62), residence in Atlanta compared with Miami (AOR = 2.57, 95% CI = 1.36 to 4.83), no history of drug treatment (AOR = 4.13, 95% CI = 2.24 to 7.62), and not being helped into care at the time of HIV diagnosis (AOR = 2.83, 95% CI = 1.56 to 5.1).

Conclusions: Our data show that a significant proportion of HIV-infected crack cocaine users in 2 US hospitals have never been to HIV care. Interventions at the time of HIV diagnosis and drug treatment participation may facilitate linkage to care.

Keywords: HIV-infected crack cocaine users, HIV care, drug use, intervention

J Acquir Immune Defic Syndr 2010;33(5):688-695

INTRODUCTION

There has been little research that has sought to examine the characteristics of HIV-infected persons who have never been to HIV care. Regular HIV care is essential for persons living with HIV to help prevent and manage their stage of HIV infection, assess patient understanding about HIV infection, and ensure antiretroviral treatment if clinically indicated. The Ryan White Care Act was created to serve as a "safety net" to ensure that all patients living with HIV receive routine care if no other funding mechanism was provided.¹

Previous studies have found poor utilization of HIV care in an inner-city, high-prevalence urban site, but of limited support, and absence of a regular source of primary health care.²⁻⁴ Studies have also shown that specific patient populations, including African American, Hispanic, and Black drug users, have been less likely to receive HIV care than HIV-positive persons not in these population groups.⁵⁻⁷ However, there were very limited data available on the characteristics of patients who have never seen an HIV care provider after receiving their HIV diagnosis. In this article, we describe the prevalence and characteristics of never having been to a doctor or clinic for HIV care among a sample of HIV-infected crack cocaine hospitalized in Atlanta and Miami.

METHODS

Study Population and Data Collection

The study population was comprised of HIV-infected crack cocaine users recruited from the medical wards at Jackson Memorial Hospital in Miami, FL, and Grady Memorial Hospital in Atlanta, GA. Institutional ethics were approved at both hospitals and all participants gave their informed consent. A single participant upon their enrollment in a hospital-based study called Project HOPE (Hospital Visit to an Opportunity for Prevention and Engagement with HIV-positive Crack Users). To be eligible, study participants were

J Acquir Immune Defic Syndr • Volume 33, Number 5, March, 2010

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

Among 355 study participants, **21% reported never having been to a doctor or clinic for HIV care.**

Higher adjusted odds of never having been in care were associated with:

- **Annual income of less than \$5000**
[adjusted odds ratio (AOR) = 8.17, 95% confidence interval (CI) = 3.35 to 19.94]
- **Residence in Atlanta compared with Miami** (AOR = 2.57, 95% CI = 1.36 to 4.83)
- **No history of drug treatment** (AOR = 4.13, 95% CI = 2.24 to 7.62)
- **Not being helped into care at the time of HIV diagnosis** (AOR = 2.83, 95% CI = 1.56 to 5.1)

AETC 19th Annual HIV CONFERENCE May 14-15, 2010
Orlando, FL

Baseline Likelihood of having **NEVER** Seen an HIV Primary Care Provider

	Adj OR	95% LCL	95%UCL
Female	1.446	0.787	2.658
40 or older	1.070	0.540	2.122
Atlanta	2.565	1.362	4.831
\$5000 and less	8.171	3.349	19.938
No history of drug treatment	4.131	2.239	7.622
Did not receive assistance to link to care when learning HIV diagnosis	2.830	1.555	5.149

AETC 19th Annual HIV CONFERENCE May 14-15, 2010
Orlando, FL

DOI 10.1007/s12053-009-9068-1
ORIGINAL PAPER

Depressive Symptoms and Food Insecurity Among HIV-Infected Crack Users in Atlanta and Miami

Nehalika S. Vagstadhar · Craig Hanley ·
Alan E. Rodriguez · Edouardo E. Valverde ·
Carlos del Rio · Lisa R. Metch

© Springer Science+Business Media, LLC 2009

Abstract Depression contributes to worse general and HIV-related clinical outcomes. We examined the prevalence of and factors associated with depressive symptomatology among HIV-infected crack cocaine users recruited for Project HOPE (Hospital Visit is an Opportunity for Prevention and Engagement with HIV-positive Crack Users). We used multiple logistic regression to determine sociodemographic correlates associated with screening in for depression. Among 291 participants, three-quarters (73.5%) were identified as depressed. Higher odds of screening in for depression was associated with food insufficiency and monthly income below \$600. Alcohol and crack use were not associated with screening in for depression. Depressive symptomatology is extremely prevalent among HIV-infected crack cocaine users and is associated with food insufficiency and lower income. Screening for depression and food insecurity should be included in HIV prevention and treatment programs. Improved recognition and mitigation of these conditions will help alleviate their contribution to HIV-related adverse health outcomes.

Keywords Depression · HIV/AIDS · Food insecurity · Crack cocaine

Introduction

Prevalence estimates suggest up to half of HIV-infected individuals may suffer from depression [1,2]. Major depressive disorders are also more likely in HIV-positive persons than in the general population [3]. In HIV-infected individuals, depression has been associated with low health-related quality of life, social isolation, poor physical health status, missed medical appointments, decreased adherence to antiretroviral therapy, and more rapid progression to AIDS and death [4, 5, 6-12].

Crack cocaine use remains common among HIV-infected persons in certain urban settings and is known to contribute to the spread of HIV through high-risk sexual behaviors [13-17]. In HIV-infected persons, crack cocaine use is associated with reduced antiretroviral adherence, accelerated HIV disease progression independent of antiretroviral medication, and a greater risk of AIDS-related death [18, 19]. Despite the extensive consequences of substance abuse and mental health problems in this population, few studies have examined correlates associated with depression specifically among HIV-positive crack cocaine users [20-22].

References

1. N. S. Vagstadhar (✉), Department of Preventive Medicine, Emory University School of Medicine, 675 New York Avenue, NE, Atlanta, GA 30307, USA. e-mail: nvagstha@emory.edu
2. C. Hanley, Department of Anthropology, Emory University, Atlanta, GA, USA
3. A. E. Rodriguez, Division of Infectious Diseases, University of Miami Miller School of Medicine, Miami, FL, USA
4. E. E. Valverde, Center for Disease Control and Prevention, Atlanta, GA, USA
5. C. del Rio, Miller School of Public Health, Rollins Department of Global Health, Emory University, Atlanta, GA, USA
6. L. R. Metch, Department of Epidemiology and Public Health, University of Miami Miller School of Medicine, Miami, FL, USA

Published online: 27 January 2010

Springer

Among 291 participants, three-quarters (73.5%) were identified as depressed. Higher odds of screening in for depression was associated **with food insufficiency and monthly income below \$600**. Alcohol and crack use were not associated with screening in for depression. Depressive symptomatology is extremely prevalent among HIV-infected crack cocaine users and is associated with food insufficiency and lower income. Screening for depression and food insecurity should be included in HIV prevention and treatment programs. Improved recognition and mitigation of these conditions will help alleviate their contribution to HIV-related adverse health outcomes

AETC 19th Annual HIV CONFERENCE May 14-15, 2010 Orlando, FL

Discussion

- Crack use is a major deterrent to health care seeking behavior.
- “Master Role of the Addict” often takes over
- Crack users are at major risk for transmission and fueling the epidemic.
- The hospital appears to be a promising venue for finding those unconnected to care and conducting prevention interventions.
- Getting people ready for drug treatment is a big challenge.
- Innovative Strategies are greatly needed

AETC 19th Annual HIV CONFERENCE May 14-15, 2010 Orlando, FL

Exploring the Hospital Setting as Potential Site for Intervention

- Their perceived level of threat or fear may be heightened, making them more motivated to change behavior.
- While hospitalized, patients may be off crack for a period of time and open to behavior change interventions.
- Most hospitals are passively linked or connected to HIV outpatient settings, drug treatment programs and other prevention services



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL

Disclosure of Financial Relationships

This speaker has no significant financial relationships with commercial entities to disclose.

This slide set has been peer-reviewed to ensure that there are no conflicts of interest represented in the presentation.



19th Annual HIV CONFERENCE

May 14-15, 2010
Orlando, FL