Published in final edited form as:

Am J Drug Alcohol Abuse. 2009 ; 35(5): 325–328. doi:10.1080/00952990903075034.

Associations between Impulsivity and High Risk Sexual Behaviors in Dually Diagnosed Outpatients

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Abstract

Background/Objectives—It is unknown whether impulsivity is associated with risky sexual behavior in dually diagnosed clients.

Methods—Impulsivity in 51 sexually-active, dually diagnosed clients was assessed by the Barrett Impulsivity Scale, Delayed Discounting Questionnaire, and Wisconsin Card-Sorting Task, and a path analysis of relationship to self-reported risk behaviors was conducted.

Results—Recent cocaine use was correlated with risky sexual behaviors and a preference for immediate over larger, delayed rewards trended towards a correlation.

Conclusion and Scientific Significance—The association between impulsivity and risky sexual behavior among substance users appears to extend to the dually diagnosed. Implications for HIV prevention are discussed.

Keywords

Cocaine; comorbidity; high risk sexual behavior; HIV; impulsivity

INTRODUCTION

People with mental illness have an HIV prevalence rate of 3.1% (1), which is higher than the general population rate of .15% (2), and people with substance use and comorbid mental disorders have an even higher HIV prevalence rate of 6.2% (3). The most common ways dually diagnosed people contract HIV involve drug use (e.g., sharing needles) and engaging in risky sexual behaviors (RSBs) (e.g., sex without barrier protection) (4), with RSBs being the stronger risk factor (5).

There have been several studies of RSBs and drug use in dually diagnosed clients. Results from one study revealed significantly higher rates of RSBs, sexual and financial

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Declaration of Interest

The authors report no conflicts of interests. The authors alone are responsible for the content and writing of the paper.

exploitation, cocaine use, and a diagnosis of AIDS among dually diagnosed people than among those without comorbid psychiatric disorders (6). Data from a sample of HIV-positive clients at mental health centers revealed several variables associated with RSBs including female gender, limited ability to complete everyday tasks independently, not having bipolar disorder, more psychotic symptoms, problem drinking and not having received HIV counseling (7).

Meade and Weiss (8) hypothesized that individuals with psychiatric disorders are prone to engage in RSBs because they tend to use drugs and alcohol to facilitate socialization and sexual relations and are especially susceptible to impairment of the judgment required to employ barrier protection. To date, no studies have considered the role of impulsivity in RSBs among the dually diagnosed despite the well-established role of impulsivity in RSBs in other populations (9–11).

Impulsivity is a multidimensional construct (13,15) that has been associated with engaging in RSBs. Three domains of impulsivity are: 1) rash-spontaneous impulsivity, defined as impetuous behavior or acting without considering the consequences, 2) preference for an immediate reward at the expense of future, larger rewards (i.e., delayed discounting), and 3) cognitive impulsivity or distractibility, defined as the extent to which an individual cannot stay on task (15).

Two research groups have found that cocaine use, alcohol use, and rash-spontaneous impulsivity were associated with RSBs (9–11). However, no studies of people with substance use disorders have examined the two other domains of impulsivity as correlates of RSBs, preference for immediate rewards and cognitive impulsivity. Furthermore, a literature search did not reveal any empiric studies that assessed whether impulsivity was associated with RSBs in the dually diagnosed. In this study, we examined the relationship between RSBs and the three impulsivity domains among dually diagnosed outpatients.

METHODS

Participants

Participants were recruited from a community mental health center to participate in a clinical trial targeting substance abuse. Participants were eligible if the following criteria were met: 1) receiving psychiatric or substance abuse treatment, 2) at least 18 years old, 3) income of at least \$450/month, 4) recent alcohol and/or cocaine use, and 5) GAF score below 65. Participants provided written informed consent to participate and all study procedures were approved by the Yale Institutional Review Board.

Impulsivity Measures

Barratt Impulsivity Scale-11 (BIS-11)—The BIS-11 is a 30-item self-report measure that assesses rash-spontaneous impulsivity (16). The total score is the sum of the raw scores of each item.

Delay Discounting Questionnaire (DDQ)—The DDQ is designed to assess the extent to which a participant discounts money if the person has to endure a delay before receiving it (14). The measure consists of 27 questions in which participants choose between a smaller amount of money immediately and a larger amount of money after a specified delay. To encourage participants to make choices that reflect real-life preferences, there is a one-in-six chance they will receive the money from one of their choices at the date they chose.

Participants' DDQ responses generate a single k-value that reflects the degree to which a participant chooses an immediate, smaller reward instead of the larger delayed reward, with higher k-values indicating more preference for immediate rewards (14).

Wisconsin Card Sorting Task-64 (WCST-64)—Cognitive impulsivity/distractibility can be assessed with the WCST-64 (17), a widely-used test of executive functioning (15). In this computerized version, participants are asked to match a virtual card with four cards presented on the computer screen. After the participant makes ten consecutive correct matches, the program switches to matching on a different criterion, without prior notification. When a participant who chooses five consecutive correct answers suddenly matches on another criterion, this shift is considered a manifestation of cognitive impulsivity (15). These unprovoked shifts are called “failure to maintain set.”

HIV Risk-Taking Behavior Scale (HRBS)—The HRBS consists of 12 Likert-scaled questions about the extent to which the respondent engaged in HIV risk behaviors in the last month (18). Sexual risk items include number of sexual partners, frequency of condom use with regular and casual partners, frequency of condom use while prostituting, and frequency of anal sex. Drug items include frequency of injecting drugs and needle sharing/cleaning. Higher scores indicate more HIV risk behavior.

Potential Covariates—Participants were assessed on several other measures including 1) demographic variables (gender, age, race/ethnicity, and years of education), 2) Axis I diagnoses as determined by the Structured Clinical Interview for DSM-IV Research Version, and 3) self-reported cocaine, marijuana, and alcohol use in the past 28 days (use/no use).

DATA ANALYSIS

Data analysis involved examining a path model (19) with impulsivity and cocaine use as the exogenous variables and HIV risk behavior as the endogenous variable. Impulsivity was measured by rash impulsivity as reflected in the BIS-11 score, preference for immediate rewards as reflected in the k-value derived from the DDQ, and cognitive impulsivity as reflected by the number of failures to maintain set on the WCST-64. Although there is no literature relating delayed discounting to RSBs, a one-tailed test was chosen since previous research had demonstrated only a positive association between rash-spontaneous impulsivity and RSBs (9–11).

RESULTS

Sample Characteristics

A total of 99 participants completed assessments. Since this sub-study examined variables related to HIV risk behavior *among sexually active participants*, participants who had not engaged in recent sexual activity or were in a monogamous relationship were excluded, leaving a total of 51 participants. None of the participants in the study reported injection drug use during the preceding 30 days and thus, HRBS scores solely reflected sexual behaviors. Thirty-nine percent of the participants were male and ages ranged from 24 to 61, with an average of 41. The highest percentage of participants was African American (55%), followed by Caucasian (31%), and Hispanic (12%). The majority of participants (72%) had graduated high school. Eighty-eight percent were receiving SSI and/or SSDI benefits. Because this sample was recruited for money management research, it was imperative that participants have sufficient funds available for budgeting.

All study participants were prescribed psychotropic medication. Altogether, 49% had a Schizophrenic Spectrum Disorder, 43% had a Depressive Disorder, and 20% had a Bipolar Spectrum Disorder. With regard to substance abuse diagnoses, 53% abused alcohol, 41% abused cocaine, and 18% abused marijuana. Forty-one percent of the participants reported having used cocaine at least once in the preceding 28 days.

The sample scored numerically higher on impulsivity measures than addicted populations in other studies. On the DDQ, the mean k -value was .07 ($SD = .10$), as compared to a mean of .02 in a sample of heroin-dependent patients in a substance abuse treatment program (14). Similarly, participants had numerically higher levels of rash impulsivity on the BIS-11 ($M = 73.15$, $SD = 12.98$) than a sample of inpatient substance abusers ($M = 69.26$, $SD = 10.28$) (20). With regard to the WCST-64 variable, participants had more failures to maintain set ($M = .48$, $SD = .95$) than cocaine-dependent users in a clinical trial for cocaine dependence ($M = .30$, $SD = .46$) (21).

With regards to HIV risk behavior, 12% reported engaging in sex trade, and 32% had a casual partner. Of those who had a casual partner, 44% reported not always using a condom when having sex with him/her. Of those who had a regular partner (94%), 64% did not always use a condom when having sex with him/her.

Path Analysis Assumptions

All assumptions of path analysis were tenable after transforming scores on the DDQ and days of cocaine use into approximately normal distributions by taking the common log of the scores (19) and transforming “failure to maintain set” into a dichotomous variable (yes/no failed to maintain set at least once).

Potential Covariates

Out of the pool of potential covariates, only cocaine use in the past 28 days correlated significantly with HIV sexual risk behavior ($r = .362$, $p = .011$).

Path Analysis

The path analysis, including all three impulsivity measures and cocaine use, revealed a good fit [$\chi^2(6) = 2.338$, $p = .886$]. However, the path between the BIS and the HRBS ($\beta = .035$, $p = .393$), and between the WCST-64 “failure to maintain set” variable and HRBS were not significant ($\beta = .007$, $p = .480$). Consequently, the finalized model included only the DDQ and cocaine use as predictors of the HRBS. The validity of the model was not rejected [$\chi^2(1) = .478$, $p = .489$], and the fit statistics were within acceptable ranges (NFI = .953 and RMSEA < .001) (17). The DDQ→HRBS path approached significance ($\beta = .193$, $p = .068$), while the Cocaine→HRBS path was significant ($\beta = .359$, $p = .003$).

DISCUSSION

This study examined whether three facets of impulsivity along with other covariates were associated with RSBs among psychiatric outpatients with a comorbid substance abuse/dependence disorder. RSBs were moderately correlated with cocaine use, and were less strongly associated with a preference for immediate rewards.

The finding that recent cocaine use was associated with RSBs extends previous research on addicted populations (9–11) to a dually diagnosed population. The findings suggest two potential approaches to reducing these behaviors in at-risk dually diagnosed patients. One is to provide cocaine abuse treatment because cocaine use is linked to RSBs. The second approach is for counselors to ask dually diagnosed patients about the settings in which they

use cocaine and explore connections between cocaine use and subsequent failure to use protection. Counselors will have to consider the possibility that lessons patients learn while abstinent, such as the need to use condoms, may not be implemented by patients who later use cocaine.

In this study, rash-spontaneous impulsivity was not associated with RSBs, although it has been associated with RSBs in other studies (9–11). A possible explanation for this discrepancy is that rash/spontaneous engagement in RSBs may be suppressed in dually diagnosed people who are prescribed sedating psychotropic medications, medications that also suppress their libido (22).

However, greater discounting of future rewards trended towards an association with RSBs, raising the possibility that dually diagnosed patients weigh the immediate reward of unsafe sex to be greater than the delayed reward of continued good health. Despite path analysis requiring a relatively large sample size for adequate statistical power (19), path analysis of the relationship between preference for immediate rewards and RSBs with only 51 subjects yielded a nearly significant positive correlation ($p = .07$). The observed correlation was not spurious and is consistent with previous research demonstrating the positive correlation between greater impulsivity and RSBs in other populations (9–11). These results suggest that the association between impulsivity and high risk sexual behavior in other populations extends to the dually diagnosed too.

An implication of this finding is that RSBs may be minimized by counseling that directly re-weights the value of immediate unsafe sex so that it is lower and the value of continued good health so that it is higher. Such re-weighting has been effective in other populations (25). Nevertheless, it is difficult to know the extent to which sex (safe or unsafe) and continued good health are rewarding. The association between preference for immediate rewards on the DDQ and RSBs in this study is consistent with the correlation between preferring immediate rewards and other harmful behaviors. The expected relationship to preference for immediate rewards has been demonstrated among people who have a psychiatric diagnosis with impulsivity as a primary feature (13), people who smoke cigarettes (23), and gamblers (24).

The main limitations to this study are that it is a correlational study and the relatively small sample size, although the sample size was adequate for conducting path analysis with few manifest variables (19). Hopefully, new risk-reduction approaches will be informed by this research, and will help slow the spread of HIV to this vulnerable population.

Acknowledgments

This research was supported in part by MHI 02-001, R01-DA012952, R21-DA15215, K02-DA017277 (MIR), the VISN 1 Mental Illness Research Education and Clinical Care Center (MIRECC) and P50-DA09241. We would like to thank Candace Minnix, Richard Carson, Karen Ablondi, and Andrea Weinstein, for their help with the data collection and management phases of the project.

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