

Impulsivity and methamphetamine use

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Abstract

The purpose of this study was to explore the relationship between methamphetamine (meth) use and impulsivity in a sample of 385 HIV-negative heterosexually identified meth users. Participants who scored highest on a self-report measure of impulsivity were compared with those who scored lower in terms of background characteristics, meth use patterns, use of alcohol and other illicit drugs, sexual risk behavior, and psychiatric health variables. Methamphetamine users in the high impulsivity group were younger, less educated, used larger quantities of meth, were more likely to be binge users, had a larger number of sexual partners, engaged in more unprotected vaginal and oral sex, and scored higher on the Beck Depression Inventory as compared with those in the low impulsivity group. In a logistic regression analysis, Beck depression was the factor that best distinguished between meth users who scored high and those who scored low on impulsivity. Neurophysiological pathways that may underlie the relationship between impulsivity and meth use are discussed. © 2005 Elsevier Inc. All rights reserved.

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1. Introduction

Methamphetamine (meth) use in the western United States increased dramatically throughout the 1990s (National Institute of Justice, 1999). In recent years, meth use has spread to the midwest and urban areas along the east coast (Methamphetamine use, 2002). Among homosexual and heterosexual users, meth use has been associated with risky sexual acts including having multiple partners, risky partner types (e.g., anonymous partners), and high rates of unprotected anal and vaginal sex acts (e.g., Molitor, Truax, Ruiz, & Sun, 1998; Morgan & Beck, 1997; Reback, 1997; Semple, Patterson, & Grant, 2002; Shoptaw, Reback, & Freese, 2002). Within the field of HIV prevention, there has been growing interest in the identification of factors that link substance use with sexual risk behavior. Impulsivity is a personality characteristic or trait that may be clinically important in

terms of understanding and intervening with drug users who engage in high-risk sexual activity. The construct of impulsivity has been of interest to personality researchers for many years (see the work of Dawe & Loxton, 2004, for a review). It is a major criterion used to diagnose a variety of clinical disorders including bulimia nervosa, attention deficit disorder, pathological gambling, substance abuse, pyromania, kleptomania, and psychopathology (e.g., antisocial personality disorder, borderline personality disorder; Butler & Montgomery, 2004). Despite the attention given to this construct, there is little consensus in terms of definition and measurement of impulsivity.

Most researchers view impulsivity as a multidimensional construct (Dawe & Loxton, 2004). Conceptual definitions of impulsivity often include one or more of the following components or dimensions: lack of premeditation, sensation seeking, rashness, lack of perseverance, urgency, and reward sensitivity (Whiteside & Lynam, 2003). The variety of definitions is matched by a range of measures used to quantify this construct. Two broad categories of measures exist. The first category of measures encompasses self-report measures of impulsivity (e.g., Dysfunctional Impulsivity

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Scale, Dickman, 1990; Barratt Impulsivity Scale; Barratt, 1985). The second category of tests includes performance-based neuropsychological tests such as the Cambridge Neuropsychological Test Automated Battery, which can be used to assess components of impulsivity (e.g., initial thinking time; Fray, Robbins, & Sahakian, 1996).

Many recent studies on impulsivity have emerged from the field of drug and alcohol research. In general, substance abusers have been found to have higher levels of impulsivity as compared with control subjects (e.g., Sher, Bartholow, & Wood, 2000; Sher & Trull, 1994). Among cocaine-dependent individuals, a significant association between impulsivity and severity of drug use has been documented (Moeller et al., 2001). High scores on impulsivity have also been associated with worse treatment outcomes in cocaine-dependent individuals (e.g., negative correlation with number of days in treatment and positive correlation with dropout rate; Patkar et al., 2004). Similarly, studies on users of 3,4-methylenedioxymethamphetamine (MDMA) have found that users of this illicit drug have higher levels of impulsivity as compared with control subjects (Parrott, Sisk, & Turner, 2000). Butler and Montgomery (2004) reported significant correlations between impulsiveness and the largest amount of MDMA used on one occasion as well as the number of tablets consumed per occasion. In another study on MDMA users, Morgan (1998) reported that MDMA users exhibited elevated levels of impulsivity on both self-report and behavioral measures; a significant positive correlation between amount of MDMA consumed and level of impulsivity was also identified. In another study, Schifano, Di Furia, Forza, Minicuci, and Bricolo (1998) reported that 14% of MDMA users met *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition* criteria for an impulse control disorder.

To date, there is a paucity of studies that examine the relationship between meth use and impulsivity. In a study of HIV-positive meth-using men who have sex with men, our research team found higher levels of impulsivity among users of injectable meth as compared with their noninjecting counterparts (Semple, Patterson, & Grant, 2004a). We concluded that the association between meth use and impulsivity warrants further investigation in broader samples of meth users. An enhanced understanding of the relationship between impulsivity and behavioral characteristics of meth users has several possible clinical implications. First, patient screening and assessment of impulsivity may help clinicians identify individuals who are at risk for substance abuse and high-risk sexual behavior. Second, knowledge regarding the role of impulsivity in the initiation and maintenance of risk behaviors may help inform the content of drug treatment and sexual risk reduction intervention programs for this target population.

The purpose of the present study was to explore the relationship between meth use and impulsivity in a large community-based sample of HIV-negative heterosexually identified meth users. We examined impulsivity in relation to

four broad categories of variables including personal and social resources (e.g., education, income), substance use (i.e., drugs, alcohol), sexual risk behavior, and psychiatric health. Based on previous studies, we hypothesized that meth users who scored highest on a self-report measure of impulsivity would have fewer personal and social resources (e.g., lower education, lower income; Matthews, Flory, Muldoon, & Manuck, 2000); consume larger amounts of alcohol, meth, and other illicit drugs (Parrott et al., 2000; Sher & Trull, 1994); engage in higher levels of sexual risk activity (Semple et al., 2004a); and exhibit worse psychiatric health (Morgan, 1998).

2. Materials and methods

2.1. Sample selection

The present data were derived from the FASTLANE research project at the University of California (San Diego, CA, USA). The FASTLANE is an 8-session sexual risk reduction intervention based on a social cognitive theory (Bandura, 1986, 1989) and the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The intervention was designed specifically for HIV-negative heterosexually identified men and women who use meth. Eligibility was based on the following criteria: (1) self-identified as heterosexual; (2) reported having unprotected vaginal, anal, or oral sex with at least one opposite sex partner during the past 2 months; (3) reported using meth at least twice in the past 2 months; and (4) tested HIV negative at baseline assessment. HIV-negative serostatus was determined through use of an OraSure HIV-1 Oral Collection Specimen Device (OraSure Technologies, Bethlehem, PA) (George, Fitchen, Goldstein, & Hindahl, 1997). The sample consisted of 385 men and women who participated in the baseline interview and first counseling session. The present analyses used baseline data only.

2.2. Procedures

Data were collected by means of computer-assisted self-interviewing technology (audio-CASI). The audio-CASI interview took approximately 90 minutes to complete and covered a range of topics including sociodemographic characteristics, alcohol use, meth use patterns, use of other illicit drugs, sexual risk behaviors, social cognitive factors, social network factors, physical health variables, and psychiatric health variables. Upon completion of the baseline assessment, subjects participated in four 90-minute individual counseling sessions at weekly intervals, four 90-minute booster sessions at monthly intervals, and three follow-up assessments at 6, 12, and 18 months postbaseline. The individual counseling and booster sessions used motivational interviewing and social cognitive behavioral strategies to address four intervention domains, which included the

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