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Short communication

Mono- and polysubstance dependent subjects differ on social factors, childhood trauma, personality, suicidal behaviour, and comorbid Axis I diagnoses

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ABSTRACT

Background: The study aimed to examine the clinical correlates of polysubstance dependence.
Subjects and methods: Seven hundred and fifty two substance-dependent subjects were interviewed with the Mini-International Neuropsychiatric Interview, the Brown–Goodwin Assessment for Lifetime History of Aggression (BGLHA), and the Hamilton Depression Rating Scale (HDRS). Subjects completed the Childhood Trauma Questionnaire (CTQ), Eysenck Personality Questionnaire (EPQ), and Barratt Impulsivity Scale (BIS). Subjects found to have polysubstance dependence were compared with subjects with monosubstance dependence.
Results: Polysubstance dependence was found in 48.3% of the subjects. Subjects with polysubstance dependence were significantly younger, more were separated/divorced and unemployed, and they had significantly higher CTQ scores for childhood emotional and physical neglect, higher EPQ psychoticism scores, higher BGLHA aggression scores, and higher BIS impulsivity scores. Significantly more of the polysubstance dependent subjects had attempted suicide, self-mutilated, and exhibited aggressive behavior. Significantly more monosubstance dependent subjects had an Axis I psychiatric disorder and they had higher HDRS depression scores.
Conclusions: Polysubstance dependence is common among the groups studied and may be associated with certain socio-demographic, developmental, and personality factors.

1. Introduction

The diagnosis of polysubstance dependence refers to a type of substance-related disorder in which an individual during the same 12-month period uses at least three different classes of substances repeatedly (not including caffeine or nicotine) but no single substance predominates. Polysubstance abuse and dependence appears to be widespread among illicit drug users (Hammersley, Forsyth, & Lavelle, 1990; Kedia, Sell, & Relyea, 2007). It appears unusual for illicit drug users to restrict their drug use to one primary drug, the use of this being typically nested in a broader pattern of polydrug use. The synergistic interaction of multiple drugs has been shown to enhance the potential for negative consequences (Leri, Bruneau, & Stewart, 2003; Wechsler & Thum, 1973). Many studies have noted that cumulative multiple drug abuse is associated with poorer physical health, greater likelihood of addiction, overdose (Risser & Schneider, 1994), HIV risk-taking (Darke, Swift, Hall, & Ross, 1994), poor treatment outcome (Downey, Helmus, & Schuster, 2000) and other social and mental health problems (Bachman & Peralta, 2002; Kendall, Sherman, & Bigelow, 1995; Schensul, Convey, & Burkholder, 2005).

The abuse of cocaine by opioid-dependent individuals is a well-known "street phenomenon", that has received clinical and experimental attention (Leri et al., 2003). Additionally new patterns of polydrug use are becoming popular, as reported in qualitative studies concerning the dance and party culture (Forsyth, 1996; Parker, Aldridge, & Measham, 1998; Schifano et al., 2005). These 'designer' illicit and prescription drugs are used together strategically to produce, enhance, or mediate specific effects (Collin, 1997; Inciardi, Surratt, Kurtz, & Cicero, 2007; Wibberley & Price, 1998).

While there has been some research examining predictive variables associated with polydrug use, these studies have tended to focus on demographic characteristics (Kedia et al., 2007) or psychosocial factors (Galaif & Newcomb, 1999; Jaffe & Archer, 1987) such as support/bonding, social conformity, and psychological distress. Other studies have examined polydrug use as a predictor of other outcomes among illicit drug users, while little is known of the correlates of the polydrug use itself. Thus, it was decided to examine the correlates of polysubstance dependence by comparing them with monosubstance dependent subjects on socio-demographic factors, psychopathological characteristics, childhood trauma, impulsivity, suicidality, and aggressiveness. Comorbidity and personality were

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examined because they have been shown to be important determinants of substance abuse (Brady & Sinha, 2005; Cloninger, Svrakic, & Przybeck, 1993). Childhood trauma was examined as studies have reported that childhood abuse and neglect may predispose individuals to substance abuse as adults (Cohen, Brown, & Smaile, 2001; Mullen, Martin, Anderson, Romans, & Herbison, 1993). History of suicide attempts was examined because studies show that suicidal behaviour is frequent in substance-dependent subjects (Roy, 2001, 2002, 2003). The hypothesis tested was that polysubstance dependent subjects would differ on socio-demographic factors, have experienced more childhood trauma, be more impulsive and aggressive, and would have exhibited more suicidal behaviour.

2. Methods

A consecutive series of 752 subjects (M/F 4/1, mean age 40.3 ± 11.8; mean years of dependence 14.8 ± 6.7) meeting diagnostic criteria for Substance Dependence (DSM-IV-TR) were consecutively recruited from the Day-Hospital (DH) of Psychiatry and Drug Dependence of the University General Hospital 'A. Gemelli' in Rome (n = 204) and from five jails in the Penitentiary District (PD) of Abruzzo and Molise (n = 548). The DH and PD groups were not significantly different in either socio-demographic characteristics (apart for the employment condition), types of substances misused, or psychiatric comorbid diagnoses. Enrolment started in May 2005 and was completed in February 2008.

Inclusion criteria included age between 18 and 65 years, a DSM-IV-TR diagnosis of Polysubstance Dependence, Monosubstance Dependence (which consisted of Alcohol Dependence or other Substance Dependence), and the ability to speak and write Italian. Exclusion criteria included a lifetime history of schizophrenia or other psychosis, cognitive impairment, and current acute withdrawal symptoms. All potential subjects presenting a withdrawal syndrome were detoxified, if required, for a flexible period of 5 to 10 days according to established and validated protocols (Lejoyeux, Solomon, & Adès, 1998).

The protocol complied fully with the guidelines of the Ethics Committee of the Università Cattolica del Sacro Cuore (Rome, Italy) and was approved by the Institutional Review Boards of the University of Molise. All the subjects included did not receive any incentive for the participation in the study.

Subjects had an in-depth psychiatric interview by specifically trained psychologists or psychiatrists. The interview included administration of the Italian version of the structured Mini-International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998) and a semistructured interview enquiring about socio-demographic variables, lifetime history of suicide attempts and self-harm. Lifetime suicidal ideation was evaluated through the Paykel Suicide Items (Paykel, 1975). The Brown–Goodwin Assessment for Lifetime History of Aggression (BGLHA) interview (Brown, Linnoila, & Goodwin, 1992) and the Hamilton Depression Rating Scale (HDRS) (Hamilton, 1960) were completed.

Patients completed the Childhood Trauma Questionnaire (CTQ) (Bernstein, Ahluvalia, Pogge, & Handlesman, 1997) the Eysenck Personality Questionnaire (EPQ) (Eysenck, Eysenck, & Barrett, 1985), and the Barratt Impulsivity Scale (BIS) (Barratt & Slaughter, 1998).

In the sample from the Penitentiary District, after the psychiatric interview, the prisoner's prison file was examined. Data were recorded about the nature of the crime for which the prisoner was convicted, the presence of past convictions, about any convictions as a minor (under 18), and about disciplinary reports of aggressive behaviour while inside the prison. In the DH sample the same parameters were investigated in those cases where a previous legal problem was reported.

In the statistical analysis, subjects were divided into two groups depending on whether or not they had a poly drug dependence (DSM-IV-TR) or mono drug dependence. Between-group differences were examined using chi-square analysis for categorical variables and Student's *t* test for continuous variables. To examine the strength of the relationships between the presence of a diagnosis of Polysubstance Dependence and different variables, logistic regression was used. The putative risk factor was the dependent variable, the presence of polysubstance dependence was the independent variable.

Table 1
Comparison of polysubstance dependent and monosubstance subjects for socio-demographic variables.

	Polysubstance	Monosubstance
	N = 360	*N* = 392
Sex (males)	288 (80)	301 (77)
Age*	36.2 ± 8.4	38.9 ± 10.7
Marital status*		
Single	227 (63.1)	204 (52)
Married	76 (21.1)	122 (31.1)
Separated/divorced	52 (14.4)	57 (14.6)
Widowed	5 (1.4)	9 (2.3)
Level of education*		
None	3 (0.8)	4 (1)
Elementary school	103 (28.6)	72 (18.4)
Lower secondary school	218 (60.6)	207 (52.8)
High school education	35 (9.7)	95 (24.2)
Degree	1 (0.3)	14 (3.6)
Employment condition*		
Unemployed	201 (55.8)	171 (43.6)
Employed	138 (38.4)	191 (48.7)
Retired	21 (5.8)	30 (7.7)
Typology of substance dependence		
Alcohol dependence	–	165 (42)
Cocaine/stimulant dependence	–	137 (35)
Opiate dependence	–	47 (12)
Cannabis dependence	–	35 (9)
Benzodiazepines dependence	–	7 (2)

Percentage are given in brackets.
* $p < .05$ (differences between groups).

3. Results

Among the 752 addicted subjects 360 (48.3%) showed a polysubstance dependence and 392 (51.7%) a monosubstance dependence. Polysubstance dependent subjects were younger ($p < .001$), had a lower level of education ($p < .001$), were predominantly unemployed ($p < .001$), and divorced/separated ($p < .05$) (Table 1). In the group of addicts not reporting a polysubstance dependence, the specific diagnosis were: Alcohol Dependence (42%), Cocaine and/or Stimulant Dependence (35%), Opiate Dependence (12%), Cannabis Dependence (9%), Benzodiazepines Dependence (2%) (Table 1). Similar, and not significantly different, were the typologies of preferred substance used in the polysubstance dependent subjects: Alcohol (39%), Cocaine and/or Stimulant (38%), Opiates (16%), Cannabis (7%).

In relation to comorbidity, significantly more of the monosubstance dependent subjects had a comorbid Axis I psychiatric disorder ($p < .05$), with a larger number of them comorbid for Bipolar Disorder (58 (14%) vs. 27 (7.5%)) and Unipolar Depression (61 (18%) vs. 45 (12.5%). Monosubstance dependent subjects also had significantly higher HDRS scores (10.2 ± 6.9 vs. 8.8 ± 6.6; $p < .05$).

In relation to the questionnaires, polysubstance dependent subjects had significantly higher CTQ scores for childhood emotional ($p < .05$) and physical neglect ($p < .001$). On the EPQ the polysubstance subsample had significantly higher scores for psychoticism ($p < .001$) (Table 2). On the Barratt Impulsivity Scale (BIS) polysubstance dependent subjects had significantly higher scores for Impulsivity Self Assessment ($p < .05$), Risk Taking ($p < .05$), and Sensation Seeking ($p < .05$). Logistic regression confirmed that psychoticism was significantly associated with the diagnosis of Polysubstance Dependence ($p < .05$).

In relation to aggression, polysubstance dependent subjects had significantly higher BGHA aggression scores ($p < .001$) and more of

Table 2
Comparison of polysubstance dependent and monosubstance subjects for interview and questionnaire scores (Means, SD).

Psychometric scale	Polysubstance	Monosubstance	*p*
BGLHA	41.7 ± 10.7	37.6 ± 11.6	0.001
HDRS	8.8 ± 6.6	10.2 ± 6.9	0.05
CTQ			
EmotionalNeglet	24.1 ± 8.7	22.1 ± 8.1	0.05
PhysicalNeglet	13.9 ± 5.5	12.4 ± 4.5	0.001
EmotionAbuse	7.84 ± 4.1	7.44 ± 4.0	n.s.
PhysicalAbuse	8.03 ± 4.7	7.79 ± 4.4	n.s.
Sexual abuse	7.72 ± 3.4	7.77 ± 3.5	n.s.
EPQ			
Psychoticism	7.0 ± 3.1	5.8 ± 3.1	0.001
Extraversion	13.4 ± 3.8	13.5 ± 3.7	n.s.
Neuroticism	13.3 ± 4.4	12.9 ± 4.8	n.s.
BIS			
ImpSelfAss	19.6 ± 8.0	18.2 ± 8.1	0.05
InterpBehav	5.8 ± 3.2	5.9 ± 3.6	n.s.
MotorImp	11.6 ± 5.3	11.3 ± 5.3	n.s.
RiskTaking	9.3 ± 4.3	8.5 ± 4.3	0.05
Sens Stim	5.4 ± 2.6	4.7 ± 2.7	0.05

them had juvenile convictions (129 (36%) vs. 79 (20%); $p<.05$), a history of multiple crimes (273 (75%) vs. 226 (57%); $p<.001$), more than one incarceration (240 (66%0 vs. 197 (50%); $p<.01$) and, considering the PD group, more violent behaviours during detention (110 (39%) vs. 59 (23%); $p<.01$).

In relation to self-harm, subjects with polysubstance dependence more frequently had a history of one or more suicide attempts (90 (25%) vs. 54 (14%); $p<.01$) and episodes of self-mutilation (129 (36%) vs. 89 (23%); $p<.01$). Lifetime suicidal ideation, evaluated through the Paykel Suicide Items, was significantly higher in the polysubstance dependence subjects (7.52 ± 3.8 vs. 6.33 ± 3.2; $p<.001$).

4. Discussion

In the present study 48% of the substance-dependent subjects had a diagnosis of polysubstance dependence. This high percentage is identical to the 48% of the 69,891 admissions to a substance abuse treatment program over a 7 years period in the state of Tennessee (US) who had polysubstance dependence (Kedia et al., 2007), and similar to the percentages reported by others (Darke et al., 1994; Lauzon et al., 1994; Staines, Magura, Foote, Deluca, & Kosanke, 2001). Thus these data confirm the relevance of the problem of polysubstance dependence, which appears to be widespread among substance abusers. The present study is the first to describe this phenomenon in the Italian context.

In the present study subjects with polysubstance dependence were compared with subjects with one substance dependence. The results confirmed our hypothesis that there would be significant differences between the two groups on socio-demographic variables, developmental factors, personality features, aggression, suicidality, and comorbidity. In relation to socio-demographic factors patients with polysubstance dependence were significantly younger, had a lower level of education, more were unemployed, and more were divorced or separated. In relation to developmental factors subjects with polysubstance dependence had experienced significantly more childhood emotional neglect and childhood physical neglect as reported on the CTQ.

The monosubstance dependent subjects were found to have significantly more Axis I comorbidity than the polysubstance dependent subjects. This result was contrary to what we expected. In relation to comorbidity it is noteworthy that studies report that more than half of all individuals with Bipolar Disorder have a substance abuse problem at some point in their lifetime (Brow, 2005; Cassidy, Ahearn, & Carroll, 2001), while individuals with alcohol and substance abuse or dependence generally experience a twofold to threefold increased risk of mood disorders (Swendsen et al., 1998), and have a higher long-term risk of relapse when affected by Axis I disorders (Landheim, Bakken, & Vaglum, 2006). The high percentage of dual diagnosed monosubstance dependent subjects found in our study is consistent with other studies' findings of comorbidity between psychiatric disorders and substance abuse (Conway, Compton, Stinson, & Grant, 2006; Grant et al., 2004).

Although comorbidity with Axis II personality disorders was not directly assessed in the present study, the personality results suggest the possibility that the polysubstance dependent patients had more Axis II features than the monosubstance subjects. For example, the polysubstance dependent subjects had significantly higher psychoticism scores on the EPQ and psychoticism was the only factor in the logistic regression significantly associated with the development of a polysubstance dependence. These data suggest the possibility of an association between Cluster A of personality disorders and polysubstance dependence especially as the personality dimension of psychoticism encompasses aggressive, impulsive, and sensation-seeking factors. In this regard it is also noteworthy that the polysubstance dependent subjects had significantly higher aggression scores on the BGHA, higher impulsivity scores on the BIS, and had exhibited more aggressive behaviour.

These significantly higher scores for impulsivity and aggression may partly be related to the significantly increased rates of suicide attempts, self-mutilation, and suicidal ideation found among the polysubstance dependent subjects. This is because the personality dimension of impulsive-aggression is generally considered to be a distal personality risk factor for suicidal behaviour. The higher rates of suicidality in the polysubstance subjects may also be related to the significantly higher childhood trauma scores for childhood emotional and physical neglect found in these subjects. This is because suicidal behaviour is a multidetermined act and childhood traumas are considered to be a distal developmental risk factor for suicidal behaviour.

Strengths of the present study include the large sample of 752 substance-dependent subjects and that they were all abstinent at the time when studied and were therefore not influenced by alcohol or other substances when assessed. A limitation is that the subjects were recruited from two different types of site.

In conclusion, these data suggest the possibility that certain socio-demographic, developmental, and personality factors may be associated with polysubstance dependence, which appears to be widespread among substance abusers.

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