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Subtyping of individuals undergoing treatment for cocaine dependence

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To identify subtypes among individuals undergoing treatment for cocaine dependence, we evaluated 115 people with regard to sociodemographic, drug-related and psychopathological characteristics. Ten variables were preselected as the basis for a two-step cluster analysis with the aim of identifying subtypes. Two subtypes were identified (Type A, N= 37, and Type B, N= 78 subjects). The variable that best discriminated the two subtypes was occasional heroin consumption. In addition, there were significant differences in mean age, mean age at onset of cocaine consumption, mean number of years consuming cocaine, and principal route of ingestion. None of the psychopathological variables considered significantly differentiated the two groups.

Subtipos entre las personas con dependencia de la cocaína en tratamiento. Evaluamos en 115 personas con dependencia de la cocaína, las características sociodemográficas, aspectos relacionados con el consumo de drogas y determinadas características psicopatológicas con el objetivo de identificar la existencia de subtipos entre las personas que están en tratamiento por dependencia de la cocaína. Seleccionamos diez variables para realizar un análisis de conglomerados en dos fases, identificándose dos subtipos (A, 37 sujetos, y B, 78 sujetos). La variable más importante para diferenciar entre los dos subtipos es el consumo de heroína alguna vez en la vida. Además, hay diferencias significativas en la media de edad, en la edad de inicio en el consumo de cocaína, en la media de años de consumo de cocaína y en la vía principal de consumo. Ninguna de las variables psicopatológicas utilizadas en el análisis resultó significativa para diferenciar entre los dos grupos.

The identification of subtypes among drug users began in alcoholism research (Jellinek, 1946). Babor et al. (1992) reported the existence of two subtypes of alcohol-dependent subject, denominated subtypes A and B. Subtype A is characterized by late onset of alcohol consumption, paucity of childhood risk factors, lack of familial antecedents, lower severity of dependence, low impulsivity and sensation-seeking scores, and high harm-avoidance scores. Subtype B is characterized by early onset of alcohol consumption, presence of childhood risk factors and/or familial antecedents, more severe dependence, consumption of other drugs, psychiatric comorbidity, and high impulsivity, sensation-seeking and antisocial behaviour scores. More recent is the research of Carpenter, Liu & Hasin (2006).

In the field of cocaine dependence, a noteworthy study was performed by Ball, Carroll, Babor and Rounsaville (1995), based on the alcoholic subtyping of Babor et al. (1992). These authors established two subtypes of cocaine user (independently of whether or not they were undergoing treatment), as a function of premorbid risk factors (age at onset of drug consumption, familial drug use, etc.), variables related to drug abuse (years duration, frequency, etc.), psychiatric problems (depression symptoms, personality disorders, etc.) and sociodemographic variables. In a sample of cocaine users, they found that 67% were subtype A and 33% subtype B. In line with Babor et al.'s classification, subtype-B subjects showed more premorbid risk factors, greater severity of drug and alcohol dependence, greater psychosocial decline related to drug abuse, and antisocial behaviour and psychiatric problems. The two most important variables explaining the differences between the two groups were severity of alcohol consumption and antisocial personality. The two subtypes did not differ as regards treatment compliance or abstinence rates.

Heil, Badger & Higgins (2001) classified cocaine users in terms of route of cocaine ingestion and presence or absence of concurrent alcohol consumption. They concluded that subjects who generally use the snorting route tend to have more problems with alcohol and consume alcohol mainly in social situations, whereas subjects who generally use the smoking route are less likely to have alcohol problems.

Although there have been few studies aimed at subtyping subjects undergoing treatment for cocaine dependence, the clinical evidence available suggests that relevant subtypes exist. Determination of subtypes among subjects undergoing treatment is likely to prove useful for optimizing the treatment strategy to be used in each case.

The aim of the present study was to identify subtypes among subjects undergoing treatment for cocaine dependence in the Centers of Drug Dependences in Galicia, NW Spain. Subtyping was based on the following variables: sociodemographic characteristics, aspects related to drug use, and psychopathological characteristics.

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On the basis of previous studies of cocaine users in Spain (Barrio-Anta, López-Gigosos, de la Fuente de Hoz, & Rodríguez-Artalejo, 1997; Bobes, Sáiz, González, & Bascarán, 2001; Calafat et al., 2000; Esparcia & Celorrio, 2005; García-Rodríguez et al., 2007; Lizosaín & Moro, 1998; López & Becoña, 2006; Muga, 2001; Muñoz, Navas, Graña, & Martínez, 2006; Rivera, 2005), we hypothesized that subjects undergoing treatment for cocaine dependence can be classified into three subtypes:

Subtype 1 - Age generally below 25 years. Consulting for treatment for drug abuse for the first time. Principal route of ingestion snorting; cocaine consumption generally associated with social recreational contexts, and thus with other drugs including alcohol. Have never used heroin. Psychopathological scores lower than in the other two subtypes.

Subtype 2 - Age generally 25 - 30 years. First or second consultation for treatment for drug abuse. Principal route of ingestion snorting; cocaine consumption generally commenced in a social recreational context, but in many cases has become a solitary habit. Consumption generally remains associated with alcohol use. Have never used heroin. Psychopathological scores higher than in the general population, and personality traits include dependence, histrionicism and narcissism.

Subtype 3 - Age generally more than 30 years. Have previously received treatment for drug abuse. Principal route of ingestion injection or smoking; cocaine consumption generally solitary. Consumption not generally associated with alcohol use, although alcohol problems may be present. Most subjects have taken heroin at some stage. Psychopathological scores high, with highly destructured functioning. Personality traits include antisocial behaviour.

Method

Participants

The participants in the study were 115 subjects (99 men, 16 women) under treatment in six public Centers of Drug Dependence in the region of Galicia in NW Spain. The sample was selected between 23 September 2003 and 28 April 2005 on the basis of the following criteria: under treatment for abuse of cocaine as principal drug; cocaine dependence as defined by DSM-IV-TR (SCID-I questionnaire of First, Spitzer, Gibbson and Williams, 1998); between 3 and 6 weeks abstinence from cocaine consumption at the onset of the study; absence of severe psychotic alterations; and capacity to respond to the evaluation instruments used. A total of 119 subjects were initially included in the study, but one subject was excluded because he did not meet criterion 2 (not cocaine-dependent) and three subjects were excluded because they did not meet criterion 3 (they had been abstinent for more than 6 weeks).

Instruments

The admission sheet of the drug dependence treatment programme, which collects diverse information about patients starting the programme, including sociodemographic information and various aspects related to drug consumption.

An instrument specially designed for the present study, designed to evaluate characteristics of cocaine consumption and its consequences.

A global evaluation of the patient performed by your therapist. For this evaluation, the therapist rated the patient's psychopathological, familial/social, work and judicial status on five-point (0 - 4) scales. In the case of psychopathological status, 0 indicated absence of symptoms, 1 mild symptoms, 2 moderate symptoms, 3 severe psychopathological disorder, and 4 severe psychopathological disorder with significant distortion of reality and/or communication deficit. In the case of familial/social status, 0 indicated normal functioning, 1 minor difficulties, 2 moderate difficulties, 3 severe difficulties, and 4 severe incapacity to maintain familial and social relations. In the case of work status, 0 indicated normal functioning, 1 minor difficulties, 2 moderate difficulties, 3 severe difficulties, and 4 severe incapacity for work. In the case of judicial status («problems with the law»), 0 indicated absence of judicial problems, 1 accusation of a minor offense, 2 accusation of a major offense, 3 on remand, and 4 currently in prison.

The Spanish version (First et al., 1998) of the *Structured Clinical Interview for DSM-IV* (SCID), for evaluation of cocaine dependence.

The Spanish version (Contel, Gual, & Colom, 1999) of the *Alcohol Use Disorders Identification Test* (AUDIT) of Saunders, Aasland, Babor, De la Fuente and Grant (1993), for evaluating the existence of excessive alcohol consumption and alcohol dependence.

The Spanish version (Vázquez & Sanz, 1997) of the *Beck Depression Inventory* (BDI) (Beck, Rush, Shaw, & Emery, 1979).

The Spanish version of the *State-Trait Anxiety Inventory* (STAI) (Spielberger, Gorsuch, & Luchene, 1971).

The Spanish version of the *Millon Clinical Multiaxial Inventory* (MCMI-II) for evaluating personality characteristics and certain clinical syndromes (Millon, 1999).

The Spanish version (Derogatis, 2002) of the *Symptoms Checklist Revised* (SCL-90-R), for evaluation of subjective feelings of malaise, and certain specific symptoms.

A 10-item self-administered scale to assess cravings, specifically designed for the present study (alpha coefficient= .86); hereinafter the *Cravings Scale*.

Procedure

Subjects were a consecutive series of patients consulting for psychological treatment in several publicly run Drug Dependence Centers in Galicia, NW Spain, between September 2003 and April 2005. For all patients thought to meet the criteria for inclusion in the study, an appointment was made for consideration by us. All subjects participating in the study gave written informed consent.

Data analysis

Subtypes were identified using two-step cluster analysis as implemented by SPSS for Windows version 12.0, with log-likelihood distance measure (as required for analyses considering both continuous and categorical variables) and automatic determination of number of clusters using the Schwartz Bayesian Criterion. A total of 10 variables were considered in this analysis:

Age. This is a key variable in drug dependence: younger people have generally been consuming drugs for less time, and the negative consequences of the drug use are generally less severe than in older drug users.

Aspects related to drug use. a) Age at which cocaine consumption commenced, negatively correlated with the severity of problems due to cocaine consumption. b) Time since onset of cocaine consumption (i.e. current age minus age at onset), positively correlated with the severity of problems due to cocaine consumption. c) Heroin consumption at some stage in life (in some cases heroin is consumed at the same time as cocaine with the aim of moderating the latter drug's intense stimulatory effects, while in other cases the subject was at one stage heroin-dependent but currently does not consume this drug); heroin consumption is generally associated with higher cocaine consumption, by the smoked or injected routes, and thus with more severe negative consequences (Leri, Bruneau, & Stewart, 2003; Ochoa, 2000; Weiss, Martínez-Raga, & Hufford, 1996). d) Frequency of consumption in the 6 months prior to treatment onset (subjects who consume cocaine every day can be expected to show more severe negative consequences than subjects who consume only once a week (Kasarabada, Anglin, Khalsa-Denison, & Paredes, 1998). e) Principal route of cocaine consumption in the 6 months prior to treatment onset, again expected to be related to the severity of negative consequences (smoking or injection is typically associated with higher consumptions, and higher risk of diseases related to needle sharing).

Psychopathological characteristics. a) AUDIT score: cocaine consumption is in many cases related to significant alcohol consumption, and in many subjects there is suspicion of alcohol dependence (Brown, Seraganian & Tremblay, 1994). Abuse of additional drugs like alcohol can be expected to be associated with more severe negative consequences (Carroll, Rounsaville, & Bryant, 1993; Gossop, Mardsen, & Stewart, 2002). b) BDI score: depressive symptoms in a recently abstinent subject are often initially related to the abstinence, but as abstinence symptoms decline may be increasingly attributable to the longer-term negative consequences of drug use, and subjects with drugs-related problems are likely to have high BDI scores. c) STAI-State score: the State subscale of this instrument measures anxiety at the moment of administration, reflecting the subject's current anxiety, and thus directly influenced by the negative consequences of cocaine abuse (O'Leary, Rohsenow, Martin, Colby, Eaton, & Monti, 2000). d) The General Symptomatic Index of the SCL-90-R evaluates the subject's general feelings of malaise over the preceding week, in terms of 90 symptoms; a high score indicates higher malaise.

Thus the ten variables considered in the cluster analysis were age (years), age at onset of cocaine consumption (years), time since onset of cocaine consumption (years), some-time heroin consumption (yes or no), frequency of cocaine consumption over the 6 months before start of treatment (daily, weekly, or occasional), principal route of cocaine administration (snorting, smoking, or injection), severity of alcohol abuse over the preceding year (AUDIT score), state anxiety (score on State subscale of the STAI), depressive symptoms (BDI score), and general malaise (score on General Symptomatic Index of SCL-90-R).

Results

Subtypes

In view of the variables considered, our results indicate that there are two subtypes of subjects undergoing treatment for cocaine dependence. Of the 115 subjects included in the present study, 37 fell into the first subtype (A), and 78 into the second subtype (B). Significant between-subtype differences were found in five of the ten variables considered (see tables 1 and 2, figure 1): mean age (34.2 years in subtype A, 29.4 years in subtype B; $t_{(113)}$= 4.02, p<.001); mean age at onset of cocaine consumption (18.4 years in subtype A, 20.5 years in subtype B; $t_{(113)}$= -2.23, p<.05); mean time since onset of cocaine consumption (16.0 years in

Table 1
Continuous variables considered in the cluster analysis for identification of subtypes, showing mean values for each variable in each of the subtypes obtained

	Subtype A (n= 37)	**Subtype B (n= 78)**	
	Mean S.D.	**Mean S.D.**	**t**
Age (years)	34.22 (5.58)	29.37 (6.22)	4.02***
Age at onset of cocaine consumption (years)	18.43 (2.72)	20.50 (5.31)	-2.23*
Time since onset of cocaine consumption (years)	16.03 (5.50)	8.88 (5.28)	6.68***
AUDIT score over preceding year	9.67 (8.08)	12.25 (8.43)	-1.55
State-anxiety (STAI-S) score	23.45 (15.36)	22.29 (11.62)	0.45
Depressive symptoms (BDI) score	15.86 (11.06)	12.62 (9.88)	1.58
General Symptomatic Index store	0.90 (0.57)	0.79 (0.56)	0.93

** p<.05; ** p<.01; *** p<.001*

Table 2
Categorical variables considered in the cluster analysis for identification of subtypes, showing number of subjects in each category in each of the subtypes obtained

	Subtype A (n= 37)		**Subtype B (n= 78)**		
	N	**%**	**N**	**%**	**χ^2 (1)**
Have you ever taken heroin?					
No	4	4.9	78	95.1	97.56***
Yes	33	100	0	0.0	
How often were you taking cocaine over the 6 months before treatment started?					
Less than once a week	4	26.7	11	73.3	4.54
Once or more a week	11	22.9	37	77.1	
Every day	22	42.3	30	57.7	
Principal route of consumption					
Snorting	11	12.5	77	87.5	66.69***
Smoking	11	91.7	1	8.3	
Injection	15	100	0	0.0	

** p<.05; ** p<.01; *** p<.001*

(1) Exact test of Fisher when indicated

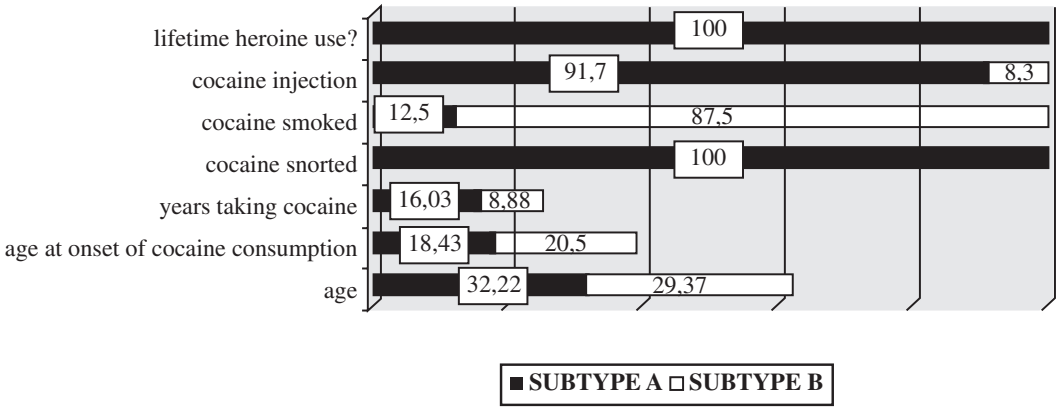

Figure 1. *Variables showing significant differences between the two subtypes, considering the ten variables used in the cluster analysis*

subtype A, 8.9 years in subtype B; $t_{(113)}$= 6.68, p<.001); some-time heroin consumption (89% of subjects in group A, 0% of subjects in group B; $\chi^2_{(1)}$= 97.56, p<.001); and principal route of administration (roughly 1/3 each route in group A, almost exclusively snorting in group B, see table 3; $\chi^2_{(2)}$= 66.96, p<.001).

Thus subtype-A subjects are generally older, started to consume cocaine younger, have consumed cocaine for longer, generally use the injection route, and have consumed heroin at some stage in their life.

There were no significant differences between the two subtypes in AUDIT score, STAI state-anxiety score, BDI score, General Symptomatic Index score, or frequency of consumption of cocaine over the six months prior to treatment.

We next compared the two subtypes as regards the remaining variables, with the results shown in tables 4 and 5 and summarized in what follows.

Sociodemographic variables

Principal source of income was work for only 49% of subtype-A subjects, versus 85% of subtype-B subjects ($\chi^2_{(2)}$= 22.06, p<.001). In line with this, only 32% of subtype-A subjects versus 59% of subtype-B subjects were in work at the start of treatment ($\chi^2_{(2)}$= 7.84, p<.05).

Of the subtype-A subjects, 84% had a partner at the start of treatment, versus only 62% of subtype-B subjects ($\chi^2_{(1)}$= 5.77, p<.05).

Variables related to drug use

Of the subtype-A subjects, only 32% requested psychotherapy on admission to the treatment programme, versus 64% of subtype-B subjects; admission to a therapeutic community was requested by 30% of subtype-A subjects, versus only 15% of subtype-B subjects.

Mean duration of previous treatment was 458 days in subtype A, versus 104 days in subtype B ($t_{(113)}$= 3.02, p<.01).

In subtype A, 67% of subjects had not at some time needed emergency hospital treatment related to drug use, versus 87% of subjects in subtype B. Mean lifetime number of emergency visits was 0.66 in subtype A versus 0.16 in subtype B ($t_{(113)}$= 2.92, p<.01).

In subtype A, 83% of subjects had previously been treated for problems related to drug abuse, versus 26.9% of subjects in subtype B ($\chi^2_{(1)}$= 32.75, p<.001). Mean number of previous treatments for drug dependence was 2.21 in subtype A, versus 0.43 in subtype B ($t_{(113)}$= 7.07, p<.001).

All subjects with confirmed HIV infection were in subtype A. However, it should be stressed that 51% of subtype-B subjects had not undergone HIV testing, versus only 19% of subtype-A subjects ($\chi^2_{(1)}$= 15.36, p<.001).

Since the start of the treatment programme, 68% of subtype-A subjects had not consumed alcohol, versus 44% of subtype-B subjects ($\chi^2_{(1)}$= 5.77, p<.05). The reasons for alcohol consumption behaviour likewise differed between the two subtypes ($\chi^2_{(1)}$= 19.69, p<.01): 16% of subtype-A subjects had never drunk alcohol, versus 6% of subtype-B subjects; 11% of subtype-A subjects were not drinking at the time of evaluation following medical advice, versus 26% of subtype-B subjects; 26% of subtype-A subjects were not drinking at the time of evaluation because they were in a therapeutic community in which drinking was banned, versus 4% of subtype-B subjects; 41% of subtype-A subjects were drinking alcohol at the time of evaluation, versus 62% of subtype-B subjects.

None of the subtype-B subjects was taking part in a methadone maintenance programme, versus 16% of subtype-A subjects ($\chi^2_{(1)}$= 5.77, p<.05); this is despite the fact that all subjects were cocaine-dependent and considered cocaine to be their principal problem drug.

The mean maximum reported amount of cocaine consumed in a single day was 6.47 g in subtype A, versus 3.88 g in subtype B ($t_{(113)}$= 3.43, p<.01). Mean reported financial outlay on cocaine before the start of the treatment programme was 2735 € in subtype A, versus 1325 € in subtype B ($t_{(113)}$= 2.33, p<.05).

Mean score on the Cravings Scale was higher in subtype A (3.86) than in subtype B (2.87) ($t_{(113)}$= 2.15, p<.05).

In the evaluation of impact of cocaine abuse on relationships with family, 76% of subjects in subtype A rated the impact as severe or very severe, versus 55% of subjects in subtype B ($\chi^2_{(2)}$= 8.02, p<.05). None of the subjects in subtype A rated the impact as zero or nearly zero.

There were also differences between subtypes as regards problems with the law: only 54% of subtype-A subjects reported little or no impact of cocaine abuse on problems of this type, versus 81% of subtype-B subjects ($\chi^2_{(2)}$= 9.04, p<.01).

Table 3
Categorical variables showing significant differences between subtypes A and B

		Subtype A		Subtype B		
		n	%	n	%	χ^2 (1)
Gender	Man	31	83.8	68	87.2	0.24
	Woman	6	16.2	10	12.8	
Treatment subtype requested	Psychotherapy	12	32.4	50	64.1	13.80**
	Therapeutic community	11	29.7	12	15.4	
	Other	8	21.6	4	5.1	
Principal source of income	Work	18	48.6	66	84.6	22.06***
	Family	8	21.6	10	12.8	
	Other	11	29.7	2	2.6	
Employment situation	Employed	12	32.4	46	59.0	7.84*
	Unemployed	18	48.6	26	33.3	
	Other	7	18.9	6	7.7	
Partner?	No	6	16.2	30	38.5	5.77*
	Yes	31	83.8	48	61.5	
Emergency hospital treatment ever required?	No	24	66.7	68	87.2	6.65*
	Yes	12	33.3	10	12.8	
Previous treatments for drug dependence?	No	6	16.2	57	73.1	32.75***
	Yes	31	83.8	21	26.9	
HIV infection?	No	27	73.0	38	48.7	15.36***
	Yes	3	8.1	0	0.0	
	Not known	7	18.9	40	51.3	
Consumption of other drugs during treatment: alcohol?	No	25	67.6	34	43.6	5.77*
	Yes	12	32.4	44	56.4	
Consumption of other drugs during treatment: methadone?	No	31	83.8	78	100	5.77*
	Yes	6	16.2	0	0.0	
Because of cocaine use problems, my relationships with my family have been affected…	Not at all or hardly at all	0	0.0	13	16.7	8.02*
	A little or quite a lot	9	24.3	22	28.2	
	A lot or a great deal	28	75.7	43	55.1	
Because of my cocaine use problems, I've had problems with the law…	Not at all or hardly at all	20	54.1	63	80.8	9.40**
	A little or quite a lot	11	29.7	8	10.3	
	A lot or a great deal	6	16.2	7	9.0	
Current alcohol consumption	Never drink alcohol	6	16.2	5	6.4	19.69**
	Drinking alcohol currently	15	40.5	48	61.5	
	Only drink alcohol when taking cocaine	2	5.4	2	2.6	
	Have stopped drinking alcohol	4	10.8	20	25.6	
	Alcohol prohibited in therapeutic community	20	25.6	3	3.8	13.91**
Therapist's evaluation of work/academic situation	Normal functioning	8	23.5	22	29.7	
	Some difficulties	7	20.6	28	37.8	
	Moderate difficulties	7	20.6	13	65.0	
	Major difficulties	7	20.6	11	61.1	
	Very severe alterations	7	100	0	0.0	

** p<.05; ** p<.01; *** p<.001*

(1) Exact test of Fisher when indicated

Psychopathological characteristics

Of the psychopathological variables evaluated in the present study, significant differences between subtypes A and B were observed only on four of the scales of the MCMI-II. Within the Moderate Personality Disorder scales, subtype-A subjects had a lower mean score than subtype-B subjects on the Dependent scale (52.8 versus 63.6; $t_{(100)}$= -2.36, p<.05), a higher mean score on the Antisocial scale (77.4 versus 67.5; $t_{(100)}$= 2.41, p<.05), and a lower mean score on the Compulsive scale (38.9 versus 50.6; $t_{(100)}$= 1.99, p<.05). Within the Moderate Clinical Syndrome scales, subtype-A subjects had a higher mean score than subtype-B subjects on the Drug Dependence scale (78.1 versus 71.7; $t_{(100)}$= 1.99, p<.05).

Differences were not observed in trait-anxiety, or in Positive Symptoms Total and Positive Symptoms Distress Index of SCL-90-R.

Table 4
Continuous variables showing significant differences between subtypes A and B

	Subtype A (n= 37)		Subtype B (n= 78)		
	Mean	**S.D.**	**Mean**	**S.D.**	**t**
Time since start of current treatment (days)	457.70	994.61	103.56	208.10	3.02**
Lifetime number of emergency hospital visits	0.66	1.33	0.16	0.49	2.92**
Number of previous treatments for drug dependence	2.21	1.85	0.43	0.84	7.07***
Maximum cocaine consumption in a single day (g)	6.47	5.14	3.88	2.92	3.43**
Total monthly outlay on cocaine (€)	2735.16	3659.87	1324.65	2686.62	2.33*
Dependent personality score (TB)	52.79	22.41	63.60	21.38	-2.36*
Antisocial personality score (TB)	77.35	19.93	67.49	19.26	2.41*
Compulsive personality score (TB)	38.88	26.22	50.62	18.65	-2.60*
Moderate Clinical Syndromes: Drug Abuse score (TB)	78.12	13.74	71.72	16.01	1.99*
Cravings Scale score	3.86	2.56	2.87	2.18	2.15*

** p<.05; ** p<.01; *** p<.001*

Therapist's evaluation

Therapists rated patients' psychopathological, familial/social, work and judicial status. Significant differences were observed only in work status, since all subjects showing major alterations in this area were of subtype A ($\chi^2_{(4)}$= 13.91, p<.01).

Discussion

The two-step cluster analysis performed in the present study indicates the existence of two subtypes among subjects undergoing treatment for cocaine dependence: subtype A (about 30% of subjects in the present study) comprises older subjects who typically started using cocaine at a younger age and who have been using it for longer, who typically ingest their cocaine by injection or smoking, who have at some time taken heroin, who have needed emergency hospital treatment related to drug use, and who have a relatively high risk of HIV infection. Subjects in this subtype are more likely to show antisocial personality. This finding is in line with Weiss et al. (1996), who found that combined cocaine and opiate users are more likely to show antisocial personality and to have been using cocaine for longer than cocaine-only users.

Subtype B (about 70% of 78 subjects in the present study) are typically younger, started cocaine consumption at a later age and have been consuming for a shorter period, and typically ingest their cocaine by snorting. These subjects are less likely to show negative consequences associated with cocaine abuse. Personality subtype is more likely to be dependent or compulsive.

Thus the differences between the two subtypes are basically sociodemographic and drug-use-related, with psychopathological variables showing only minor differences between the two groups. Similar results are obtained if we take into account the other variables considered in the study.

Subjects in subtype A typically request entry into a therapeutic community, or some other non-psychotherapy treatment, while subjects in subtype B typically request psychotherapy. Subjects in subtype A probably have a partner. In both groups the main source of income is work, but a higher proportion of subjects in subtype A have family or «other» as main source of income. Subjects in subtype A are more likely to be working.

Subjects in subtype A are more likely to have required emergency hospital treatment related to drug use, to have previously received treatment for drug use, and to be HIV-infected (although note that in the present study a higher proportion of subjects in subtype B had never undergone HIV testing). Subjects in subtype B are more likely to be alcohol drinkers (because a larger proportion of these subjects have never drunk, and a smaller proportion enter therapeutic communities in which drinking is prohibited). In the present study, all subjects in the methadone maintenance programme belonged to subtype A.

In general, subtype-A subjects consider their cocaine consumption to have had more severe effects on family relationships and problems with the law.

Subtype-A subjects are more likely to show an antisocial personality subtype than subtype-B subjects, who are more likely to show dependent or compulsive personality subtype.

Finally, the therapists' evaluation of subtype-A subjects is more likely to indicate severe impacts of drug abuse in the work/study sphere.

The two subtypes identified in the present study show a close correspondence with subtypes 2 and 3 proposed in the Introduction. However, there were no differences in psychopathological characteristics between subtypes A and B, in contrast with the subtyping hypothesized *a priori* and in contrast with the suggestions of previous studies (Bobes et al., 2001; Lizosaín & Moro, 1998; Muga, 2001).

A possible explanation for our non-identification of the subtype 1 hypotethesized, is that younger subjects have generally been consuming heroin for a shorter time and have not yet reached clinically diagnosed dependence (see Barrio-Anta et al., 1997); thus such subjects were not included in the present study.

In conclusion, the differences between the two subtypes identified in the present study are related to variables describing cocaine abuse, not psychopathological variables. These results indicate that cocaine-dependent subjects who have taken heroin at some stage in their life, and who generally ingest cocaine by smoking or injection, do not have more psychopathological

difficulties than cocaine-dependent subjects who have never consumed heroin and who ingest cocaine by snorting; this is despite the fact that *a priori* one would expect the former pattern to be more damaging (Leri et al., 2003; Ochoa, 2000; Weiss et al., 1996), and thus more likely to lead to psychopathological problems.

These results indicate that in the design and adaptation of assistance programmes for subjects undergoing treatment for cocaine dependence, it is important to take into account that sociodemographic characteristics and drug consumption behaviour may differ markedly between individuals. Independently of these characteristics, however, it is necessary to individually evaluate the psychopathological characteristics of all subjects.

In next studies, we must analyze variables like severity of dependence, impulsivity or sensation-seeking. Similar to studies of Babor et al. (1992) and Schuckit et al. (1995).

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