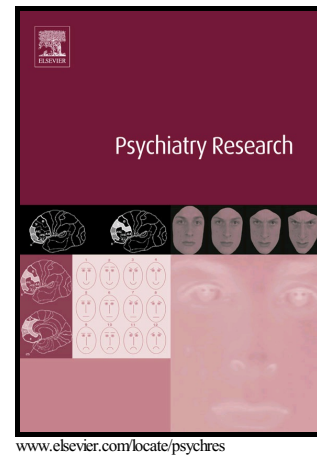


Author's Accepted Manuscript

Clinical differences between cocaine-dependent patients with and without antisocial personality disorder

Marina Comín, Santiago Redondo, Constanza Daigre, Lara Grau-López, Miguel Casas, Carlos Roncero



PII: S0165-1781(16)30820-4
DOI: <http://dx.doi.org/10.1016/j.psychres.2016.10.083>
Reference: PSY10087

To appear in: *Psychiatry Research*

Received date: 11 May 2016
Revised date: 26 July 2016
Accepted date: 21 October 2016

Cite this article as: Marina Comín, Santiago Redondo, Constanza Daigre, Lara Grau-López, Miguel Casas and Carlos Roncero, Clinical differences between cocaine-dependent patients with and without antisocial personality disorder *Psychiatry Research*, <http://dx.doi.org/10.1016/j.psychres.2016.10.083>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Clinical differences between cocaine-dependent patients with and without antisocial personality disorder

Marina Comín^{a,c*}, Santiago Redondo^b, Constanza Daigre^a, Lara Grau-López^{a,c,d}, Miguel Casas^{c,d}, Carlos Roncero^{a,c,d}

^aAddiction and Dual Diagnosis Unit. Psychiatry Department. Vall Hebron Hospital-ASPB. Universitat Autònoma de Barcelona. Spain. CIBERSAM

^bDepartment of Personality, Assessment and Psychological Treatment. Universitat de Barcelona. Spain

^cDepartment of Psychiatry, Hospital Universitari Vall d'Hebron, CIBERSAM, Universitat Autònoma de Barcelona. Spain

^dDepartment of Psychiatry and Legal Medicine. Universitat Autònoma de Barcelona, Spain

***Corresponding author:** Psychiatry Services. Hospital Universitari Vall d'Hebron. Passeig de la Vall d'Hebron, 119-129, 08035 Barcelona, Spain. Tel.: 934894294; fax: 934894587. mcomin@vhebron.net

ABSTRACT

The aim of this study is to compare the features of two groups of cocaine dependent patients in treatment, one of them with co-morbid diagnosis of antisocial personality disorder and the other not. Cross-sectional design, with 143 cocaine-dependent patients attending a drug unit, distributed in two groups: patients with and without Antisocial Personality Disorder. As results, we found that the 15.38 % of the sample were diagnosed with an Antisocial Personality Disorder. In relation to socio-demographic variables, Antisocial Personality Disorder patients have less probability of being working or studying (9.1% vs. 47.9%).

After multivariate analysis it was found that significantly Antisocial Personality Disorder patients have more opiates dependence (OR: 0.219; 95% IC 0.072-0.660), sedative dependence (OR: 0.203; 95% IC 0.062-0.644) and in more cases show Borderline Personality Disorder (OR: 0.239; 95% IC

0.077-0.746). This study highlights significant differences between cocaine addicts with or without an Antisocial Personality Disorder. All these differences are good indicators of the complexity of the patients with this personality disorder. Better knowledge of their profile will help us to improve the design of specific treatment programs.

Keywords

Antisocial personality disorder; cocaine dependence; PRISM; addiction; addiction severity; dual diagnosis.

1. Introduction

The co-morbidity between substance use disorders (SUD), personality disorders (PDs) and antisocial behaviour have been reported in the specialised literature (Pedrero et al., 2003; Comptom et al., 2005; Walsh et al., 2007; Fridell et al., 2008; Mariani et al., 2008; Arias et al., 2013; Roncero et al., 2013a; Ribas-Siñol et al., 2015; Sher et al., 2015). It is well documented that alcohol and drug abuse, in connection with some personality disorders, precede or are associated with many violent crimes (Kaye et al., 1998; Fridell et al., 2008; Redondo and Garrido, 2013). Kaye, in a cohort of 400 heroin users in Australia, found a significant relationship between the subjects' diagnosis of antisocial personality disorder (ASPD) and some socio-demographic features such as being younger and male, and having committed more violent crimes.

In clinical terms, the assessment of PDs in a drug-addict population should be made with caution, as there may eventually be concomitant drug abuse factors that could erroneously increase co-morbidity diagnoses (Vergara-Moragues et al., 2013).

The specific relationship between cocaine consumption and PDs has been extensively analysed, and, in general, the studies found that cocaine dependence is one of the factors most strongly associated with the ASPD (Kranzler et al., 1994; Bauer, 2001; Grella et al., 2003; López Durán et al., 2006; Paim et al., 2012; Arias et al., 2013; Roncero et al., 2013b; Araos et al., 2014). According to the DSM-IV-TR, ASPD is characterized by a pervasive pattern of disregard for and violation of the rights of others, as well as an inability or unwillingness to conform to societal norms (American Psychiatric Association, 2000).

Several studies show that the general prevalence of ASPD in SUD patients ranges from 7 to 53%. Particularly in the cocaine-dependent population this prevalence is between 11 and 20% (Herrero

et al., 2008; Mariani et al., 2008; Roncero et al., 2014a). In some studies, ASPD has been reported to have a negative impact on the prognosis of SUD, (Westermeyer et al., 2005; Fridell et al., 2008); but other analyses found no significant differences between substance consumers with and without a PD (Franques et al., 2000).

In parallel to ASPD, another frequent diagnosis in drug abusers is Borderline Personality Disorders (BPD). Co-morbidity of ASPD and BPD has been observed for heroin users, particularly for heroin overdose (Darke et al., 2004), and for female offenders (Chapman and Cellucci, 2007). Antisocial/Borderline co-morbidity has also been related to an increased risk of violent crimes and recidivism (Howard et al., 2013).

It has been proposed that antisocial personality disorder (ASPD) and borderline disorder (BPD) could have similar psychopathology bases (neglect and childhood abuse, impulsivity, emotional lability...) and for that at least partially overlap in terms of both their risk factor and symptoms (Beauchaine et al., 2009). In a recent longitudinal study with 2282 Norwegian twins, both personality disorders appear to be moderately stable between early and middle adulthood probably because the main influence on them of perhaps some similar genetic risk factors (Reichborn-Kjennerud et al., 2015). Contrary, other studies support the fact that ASPD and BPD are not equal but really distinct personality disorders (Paris et al., 2013). In this way, for example substance abuse shows in general a stronger relationship with the diagnosis of ASPD than with BPD diagnosis (Hatzitasko et al., 1999; Chávez et al., 2010).

However, the relationship between drug abuse and violent behaviour –in subjects with or without a diagnosis of ASPD– tends to be complex. In fact, the results of scientific research of the connection between ASPD and criminal conduct in substance abuser samples are mixed (Fridell et al., 2008): whereas some studies found that ASPD may be a strong predictor of criminal behaviour (Grella et al., 2003; Elbogen and Johnson, 2009), others did not find a consistent relationship between the two factors (Alterman et al., 1998; Hernández-Avila et al., 2000; Bovasso et al., 2002). In parallel, ASPD' diagnosis, in some cases, has proven to be a significant predictor of treatment dropout (Daughters et al., 2008) but not in other cases (Mariani et al., 2008).

Even so, the studies that have analysed broader samples of drug-addicts have generally found a positive association between ASPD and antisocial behaviour (Fridell et al., 2008; Mariani et al., 2008).

The contradictory results often obtained in this field might be attributed in many cases to methodological problems related to data validity, as many studies are exclusively based on self-

reported information (Fridell et al., 2008). But, in other cases, these mixed results may derive from the fact that drug consumption, PDs and antisocial behaviour are probably not completely independent. Contrariwise, all these variables may be parts or ingredients of a more general behavioural syndrome, which is a result of the combination of personality and early maladaptive schemes (influenced by possible childhood traumas) and environmental factors (Elzo et al., 1992; Farrington, 2003; Redondo and Garrido, 2013; Shorey et al., 2014; Karsinti et al., 2015).

According to the drug-addiction pharmacological model, the consumption of illegal substances is related to different violent crimes, and also to offences against property (Miller et al., 2006). It is frequent that the cocaine consumers display paranoid delusions, with visual and auditive hallucinations (Roncero et al., 2013b). These symptoms may be related to misinterpretation of the environmental stimuli, leading to the facilitation of aggressive and antisocial behaviours (Brady et al., 1991). Some authors have studied the relationship between ASPD and other specific cocaine-related symptoms, such as induced psychotic symptoms (Roncero et al., 2014b). Furthermore, violent people may consume drugs like cocaine in order to reduce their anxiety and inhibitions about breaking the law and injuring other people. Antisocial behaviours related to prostitution, stealing to pay for drugs, and revenge are other crimes often associated with illegal substance consumption (Paim et al., 2012; Duff et al., 2013).

Better assessment and knowledge of individual differences and characteristics of drug-dependent with ASPD, could have important implications for adjusting and improving future treatment programs, and to prevent worsening their condition and quality of life. Treating patients with an ASPD is a complex issue. There is limited evidence of the effectiveness of commonly used psychotropic drugs (Khalifa et al., 2010). The multidisciplinary team involved in the therapy should agree on the treatment, which should match the patient's characteristics.

Our study aims to provide knowledge by analyzing a specific population of patients who come to our public centre asking for treatment. This research attempts to describe and compare the individual and clinical characteristics of two groups of patients treated for cocaine dependence: subjects with and without ASPD. Our general hypothesis is that, as a function of whether or not they have ASPD, subjects will present different profiles in terms of socio-demographic and clinical data (age of onset and years of dependence, other co-morbid SUD and/or other Axis I and Axis II Mental Disorders).

2. Methods

2.1. Participants

The 143 participants in this study were patients who had received treatment at the Drug Unit of the Psychiatry Department of the University Hospital Vall d'Hebron in Barcelona (Spain). Inclusion criteria were: being over 18 years old, having a diagnosis of cocaine dependence, and being an outpatient and/or hospitalized in the hospital's detoxification unit. Each patient signed an informed consent form to participate in the study, which was approved by the university ethics committee. The patients received no financial compensation for participating in the research. Exclusion criteria were: having severe somatic disorders, and not having sufficient language proficiency in Spanish.

Over a period of three and one half years (February 2008 to September 2010), 304 patients came to our cocaine program, and all of them were invited to participate in the psychological assessment process. Of these, 51 refused to voluntarily be included in the study. 35 more subjects were discarded by exclusion criteria: Not having sufficient language proficiency in Spanish (20) or showing severe somatic disorders such as cognitive impairment or worsening of infectious diseases (15). Other 75 patients more have not been included in the data analysis, because they started the assessment but not finished it.

2.2. Assessment and measures

In addition to the socio-demographic (age, sex, studies, marital and work status and crime history) and drug consumption variables, participants were also assessed by means of the Spanish version (Torrens et al., 2004) of the Psychiatric Research Interview for Substance and Mental Disorders, PRISM (Hasin et al., 1996). This DSM-IV-based interview allows the diagnosis of approximately 20 Axis I and II disorders, including, among the latter, Borderline Personality Disorder (BPD) and Antisocial Personality Disorder (ASPD). The PRISM was specifically designed to identify primary mental disorders and induced effects of intoxication and withdrawal in subjects with high consumption of alcohol and other drugs. It includes specific guidelines to assess the frequency and duration of symptoms and provides disorder exclusion criteria, in order to determine the temporal

relationship between psychiatric symptoms and substance use. According to the individuals' scores on the ASPD section of this interview guideline, the analysed sample was divided into two groups: Group I, patients with ASPD; and Group II, patients without ASPD. The disorders with no representation in some of both groups were not analyzed

2.3. Design

This research is a cross-sectional observational study. Patients were assessed during two clinical interviews. Initially, they were evaluated by a psychiatrist who collected demographic and substance consumption data and, if applicable, made a diagnosis of cocaine dependence disorder according to DSM-IV-TR criteria. Subsequently, the subjects were assessed by a specialised psychologist trained in the administration of the diagnostic interview described below (PRISM).

2.4. Data Analysis

As ASPD was used to define the two groups of the study, this variable is simply described in terms of frequencies. We used F-tests for continuous variables and chi-square tests for categorical variables to compare the socio-demographic and clinical characteristics of the sample, as well as to detect the presence of co-morbidities in the subjects of both groups. When the chi-square test was not applicable, Fisher's exact test was conducted for categorical variables due to the expected small cell counts.

Bonferroni corrections for multiple tests were performed to reduce false positive effects, grouping socio-demographic variables, SUDs and other mental disorders. After Bonferroni correction, drawing on the previous bivariate analysis, a logistic regression model was carried out to analyze the following clinical variables: opiate and sedative abuse or dependence, ADHD in childhood, induced psychotic disorder and BPD. The variables retained statistical significance.

All statistical hypotheses were two-tailed. SPSS, version 18.0 for Windows was used for all the analyses.

3. Results

Socio-demographic data are presented in Table 1. Of the 143 evaluated subjects, 22 (15.38 %) were diagnosed with ASPD. Most of these patients are men (81.8%), with an average age of 34.27 years, single (18.2%), without having finished primary studies (40.9%), living alone (22.7%), imprisoned one or more times (72.7%) and only 9.1% are active (working or studying). The mean age of onset of drug consumption was 22.59 years old, and they have been cocaine-dependent for an average period of 10.95 years.

Statistically significant differences between the two study groups were found in the following variables: dependence duration, imprisonment status, not having finished primary studies, and “being active” (in terms of working or studying). Nevertheless, after Bonferroni correction, only the variable “being active” was statistically significant.

Co-morbidities can be observed in Table 2. Regarding other substances, statistically significant differences between the groups in terms of the co-morbid consumption of opiates and sedatives were found before and after Bonferroni correction. In relation to Axis I disorders, ADHD in childhood, Substance-Induced Mood Disorder and Substance-Induced Psychotic Disorder were initially significant, but after Bonferroni correction, factor Substance-Induced Mood Disorder was no significant. Concerning Axis II, BPD was statistically significant.

According to logistic regression analysis, the factors Dependence on opiates and sedatives and BPD were statistically significant. Thus, the diagnosis of ASPD appears to be related to these disorders.

4. Discussion

The present study assesses ASPD in a sample of cocaine-dependent patients, and explores the relationship between this PD and diverse socio-demographic factors and other co-morbid mental disorders.

Nearly 15% of the subjects of the sample were diagnosed with ASPD. This result is consistent with the outcomes obtained in other clinical studies, which have often reported a similar prevalence of ASPD (Mariani et al., 2008; Herrero et al., 2008; Arias et al., 2013). Some of the observed differences between the analysed groups could be a result of the sample selection method. For example, in our study, only subjects who sought treatment at a health centre were selected, whereas in other investigations, for example, cocaine users are recruited from non-clinical settings (Herrero et al., 2008).

The profile of cocaine-dependent patients with ASPD in this study is similar to that obtained in other previous research (Kaye et al., 1998; Comptom et al., 2005): most of the patients are young people, single, with a very low academic level, unemployed and with more probability of having been imprisoned. Our results about the age of onset of cocaine dependence also confirm those of previous studies (Mariani et al., 2008; Lewis, 2011). Furthermore, it makes sense that onset-age of cocaine dependence in the ASPD group is lower than in the non-ASPD group.

Regarding sex distribution, we did not find differences in ASPD among women and men. ASPD in women usually is under diagnosed. Anyway some clinical differences about have been described, for instance, women show more mental distress and men more addictions (Grella et al., 2003). Consistent with the results obtained in other analyses (Lewis, 2011; Cacciola et al., 1994), patients with ASPD have a significant longer history of imprisonment than patients without ASPD. It has been suggested that the use of stimulants could generate psychotic symptoms that trigger disruptive behaviour (Lapworth et al., 2009; Roncero et al., 2014b). This mental state can contribute to the perception of the environment as a hostile and threatening place, thereby, increasing the individual's impulsivity. As a consequence, cocaine consumption could be linked to different hostile and antisocial behaviours.

According to our results, the ASPD group obtained a higher score in the variable substance-induced psychosis, which makes us think about the severity of this patient profile. ASPD is also associated with opiate and sedative use disorders, which is consistent with prior research showing that cocaine-dependent individuals are frequently poly-drug addicted (Grella et al., 2003).

As well, according to previous studies linking ASPD to other Axis I mental disorders (Tang et al., 2007; Roncero et al., 2013a; Roncero et al., 2013b), our results also confirm that ASPD is related

to ADHD in childhood (Easton et al., 2007; Ribas-Siñol et al., 2015), Substance-induced Mood Disorder and Substance-induced Psychotic Disorder.

In relation to Axis II disorders, a connection between ASPD and Borderline Personality Disorder is observed. This result is also consistent with prior literature (Kranzler et al., 1994; López Durán et al., 2006; Darke et al., 2004; Chapman and Cellucci, 2007; Howard et al., 2013). According to the previously referred study of Reichborn-Kjennerud et al. (2015), ASPD and BPD overlap to a large extent the same genetic influences, which could essentially explain the generally observed co-morbidity between both personality disorders.

Comparing the subjects in the two evaluated groups, the ASPD group shows poly-drug use and longer drug dependence. Most of the individuals in this group had achieved a lower educational level and were unemployed, which increases their difficulties to resolve their daily problems satisfactorily. All these factors also seem to be good indicators of the severity of the patient's addiction.

Our results are coherent with other studies that describe more severity in ASPD patients. Some authors predict poorer adherence to treatment and worse therapeutic results for subjects diagnosed of ASPD (Westermeyer et al., 2005; Fridell et al., 2006). ASPD patients often begin treatment mainly to avoid legal and health problems arising from their drug consumption rather than because of a genuine desire to change and improve their behaviour. However, other studies have suggested that ASPD subjects could also benefit from therapeutic treatment (Franques et al., 2000; McKay et al., 2000; Messina et al., 2003; Easton et al., 2007).

Probably, the main limitation of this clinical research is that it is mostly based on patients' self-reported data, which precludes guaranteeing the validity of any information provided by patients. Also, 51 patients refused to voluntarily participate in the study, which can be a bias in the results. During the evaluation, it was not possible to know whether or not the amount of the cocaine consumed by the subjects was associated with their ASPD diagnoses. As well, our study did not specifically explore the relationship between the subjects' clinical and personality features and the specific types of crimes that they had committed. Future research of this topic should consider all these relevant shortcomings.

We can conclude that cocaine-dependent patients with an ASPD are more serious patients than cocaine dependents without ASPD, in terms of co-morbidity with other SUD (opiate addiction) and BPD relationship. So a better knowledge of the personal and behavioural characteristics of these

special and complex cocaine consumers can help us to develop a better adjusted therapy for them. In particular, well-defined assessment and treatment protocols could aid professionals to improve their chances of helping these patients to achieve a healthier and more pro-social future.

References

Alterman, A. I., Rutherford, M. J., Cacciola, J. S., McKay, J. R., Boardman, C. R., 1998. Prediction of 7 months methadone maintenance treatment by four measures of antisociality. *Drug and Alcohol Dependence* 49, 217-223

APA. American Psychiatric Association, 2000. *Diagnostic and Statistical Manual of Mental Disorders*. Vol. Fourth Edition, text revision, Washington, DC.

Araos, P., Vergara-Moragues, E., Pedraz, M., Pavón, F. J., Cloute, R. C., Calado, M., De Fonseca, F. R., 2014. [Comorbilidad psicopatológica en consumidores de cocaína en tratamiento ambulatorio]. *Adicciones* 26(1), 15–26.

Arias, F., Szerman, N., Vega, P., Mesias, B., Basurte, I., Morant, C., Babin, F., 2013. Alcohol abuse or dependence and other psychiatric disorders. Madrid study on the prevalence of dual pathology. *Mental Health and Substance Use* 6(4), 339–350.

Bauer, L. O., 2001. Antisocial personality disorder and cocaine dependence: their effects on behavioral and electroencephalographic measures of time estimation. *Drug and Alcohol Dependence* 63(1), 87–95.

Beauchaine, T. P., Klein, D. N., Crowell, S. E., Derbidge, C., Gatzke-Kopp, L., 2009. Multifinality in the development of personality disorders: A Biology x Sex x Environment interaction model of antisocial and borderline traits. *Development and Psychopathology* 21, 735-770.

- Bovasso, G. B., Alterman, A. I., Cacciola, J. S., Rutherford, M. J., 2002. The prediction of violent and nonviolent criminal behavior in a methadone maintenance population. *Journal of Personality Disorders* 16(4), 360–373.
- Brady, K. T., Lydiard, R. B., Malcolm, R., Ballenger, J. C., 1991. Cocaine-induced psychosis. *The Journal of Clinical Psychiatry* 52(12), 509–512.
- Cacciola, J. S., Rutherford, M. J., Alterman, A. I., Snider, E. C., 1994. An examination of the diagnostic criteria for antisocial personality disorder in substance abusers. *The Journal of Nervous and Mental Disease* 182(9), 517–523.
- Chapman, A. L., Cellucci, T. (2007). The role of antisocial and borderline personality features in substance dependence among incarcerated females. *Addictive Behaviours* 32, 1131-1145.
- Chávez, J. X., Dismore, J. A., Hof, D. D., 2010. Assessing the incidence rates of substance use disorders among those with antisocial and borderline personality disorders in rural settings. *International Journal of Psychology: A Biopsychosocial Approach* 6, 57-66.
- Compton, W. M., Conway, K. P., Stinson, F. S., Colliver, J. D., Grant, B. F., 2005. Prevalence, correlates, and comorbidity of DSM-IV antisocial personality syndromes and alcohol and specific drug use disorders in the United States: results from the national epidemiologic survey on alcohol and related conditions. *The Journal of Clinical Psychiatry* 66(6), 677–685.
- Darke, S., Williamson, A., Ross, J., Teesson, M., Lynskey, M. (2004). Borderline personality disorder, antisocial personality disorder and risk-taking among heroin users: findings from the Australian Treatment Outcomes Study (ATOS). *Drug and Alcohol Dependence* 74, 77-83.
- Daughters, S. B., Stipelman, B. A., Sargeant, M. N., Schuster, R., Bornovalova, M. A., Lejuez, C. W., 2008. The interactive effects of antisocial personality disorder and court-mandated status on substance abuse treatment dropout. *Journal of Substance Abuse Treatment* 34(2), 157–164.
- Duff, P., Tyndall, M., Buxton, J., Zhang, R., Kerr, T., Shannon, K., 2013. Sex-for-Crack exchanges: associations with risky sexual and drug use niches in an urban Canadian city. *Harm Reduction Journal* 10(1), 29.

- Easton, C. J., Babuscio, T., Carroll, K. M., 2007. Treatment retention and outcome among cocaine-dependent patients with and without active criminal justice involvement. *J Am Acad Psychiatry Law* 35(1): 83-91.
- Elbogen, E. B., Johnson, S. C., 2009. The Intricate Link Between Violence and Mental Disorder. *Archives of General Psychiatry*, 66(2) 152–161.
- Elzo, J., Lidon, J. M., Urquijo, M.L., 1992. [Drug abuse and crime]. Secretaria de la presidencia del Gobierno Vasco.
- Farrington, D. P., 2003. Advancing knowledge about the early prevention of adult antisocial behaviour. *Early Prevention of Adult Antisocial Behaviour*, 1-31.
- Franques, P., Auriacombe, M., Tignol, J., 2000. Addiction and personality. *L'Encephale* 26(1), 68–78.
- Fridell, M., Hesse, M., Johnson, E., 2006. High prognostic specificity of antisocial personality disorder in patients with drug dependence: results from a five-year follow-up. *The American Journal on Addictions / American Academy of Psychiatrists in Alcoholism and Addictions* 15(3), 227–232.
- Fridell, M., Hesse, M., Jæger, M. M., Kühlnhorn, E., 2008. Antisocial personality disorder as a predictor of criminal behaviour in a longitudinal study of a cohort of abusers of several classes of drugs: Relation to type of substance and type of crime. *Addictive Behaviors* 33(6), 799–811.
- Goldstein, P. J., Brownstein, H. H., Ryan, P. J., 1989. Crack and Homicide in New York City: A Conceptually Based Event Analysis. *Contemporary Drug Problems* 16 (4), 651-687.
- Grella, C. E., Joshi, V., Hser, Y. I., 2003. Followup of cocaine-dependent men and women with antisocial personality disorder. *Journal of Substance Abuse Treatment* 25(3), 155–164.
- Hasin, D. S., Trautman, K. D., Miele, G. M., Samet, S., Smith, M., Endicott, J., 1996. Psychiatric Research Interview for Substance and Mental Disorders (PRISM): reliability for substance abusers. *The American Journal of Psychiatry* 153(9), 1195–1201.

Hatzitaskos, P., Soldatos, C. R., Kokkevi, A., Stefanis, C. N. (1999). Substance abuse patterns and their association with psychopathology and type of hostility in male patients with borderline and antisocial personality disorder. *Comprehensive Psychiatry* 40(4), 278-282.

Hernandez-Avila, C. A., Bureson, J. A., Poling, J., Tennen, H., Rounsaville, B. J., Kranzler, H. R., 2000. Personality and substance use disorders as predictors of criminality. *Comprehensive Psychiatry* 41(4), 276–283.

Herrero, M. J., Domingo-Salvany, A., Torrens, M., Brugal, M. T., Gutierrez, F., 2008. Personality profile in young current regular users of cocaine. *Substance Use & Misuse* 43(10), 1378–1394.

Howard, R., McCarthy, L., Huband, N., Duggan, C. (2013). Re-offending in forensic patients released from secure care: the role of antisocial/borderline personality disorder co-morbidity, substance dependence and severe childhood conduct disorder. *Criminal Behaviour and Mental Health* 23, 191-202.

Karsinti, E., Jarroir, M., Zerdazi, E., Bloch, V., Dupuy, G., Belforte, B., Vorspan, F., 2015. Childhood trauma are not associated with the intensity of transient cocaine induced psychotic symptoms. *Psychiatry Research*, 228(3), 941-4.

Kaye, S., Darke, S., Finlay-Jones, R., 1998. The onset of heroin use and criminal behaviour: Does order make a difference? *Drug and Alcohol Dependence* 53(1), 79–86.

Khalifa, N., Duggan, C., Stoffers, J. M., Huband, N., Vollm, B. A., Lieb, K., Ferriter, M., 2009. Pharmacological interventions for antisocial personality disorder. *Cochrane Database of Systematic Reviews*. (1), 2009. Article Number: CD007667. Date of Publication: 2009, (United Kingdom LG - English PT - Journal: Review EM - 200900 DD - 20091130), CD007667.

Kranzler, H. R., Satel, S., Apter, A., 1994. Personality disorders and associated features in cocaine-dependent inpatients. *Comprehensive Psychiatry* 35(5), 335–340.

Lapworth, K., Dawe, S., Davis, P., Kavanagh, D., Young, R., Saunders, J., 2009. Impulsivity and positive psychotic symptoms influence hostility in methamphetamine users. *Addictive Behaviors* 34(4), 380–385.

- Lewis, C. F., 2011. Substance use and violent behaviour in women with antisocial personality disorder. *Behav Sci Law* 29(5):667-76
- Lopez Duran, A., Becona Iglesias, E., 2006. [Patterns and personality disorders in persons with cocaine dependence in treatment]. *Psicothema* 18(3), 578–583.
- Mariani, J. J., Horey, J., Bisaga, A., Aharonovich, E., Raby, W., Cheng, W. Y., Levin, F. R., 2008. Antisocial behavioral syndromes in cocaine and cannabis dependence. *The American Journal of Drug and Alcohol Abuse* 34(4), 405–414.
- McKay, J. R., Alterman, A. I., Cacciola, J. S., Mulvaney, F. D., O'Brien, C. P., 2000. Prognostic significance of antisocial personality disorder in cocaine-dependent patients entering continuing care. *The Journal of Nervous and Mental Disease* 188(5), 287–296.
- Messina, N., Farabee, D., Rawson, R., 2003. Treatment responsivity of cocaine-dependent patients with antisocial personality disorder to cognitive-behavioral and contingency management interventions. *Journal of Consulting and Clinical Psychology* 71(2), 320–329.
- Miller, T. R., Levy, D. T., Cohen, M. A., Cox, K. L. C., 2006. Costs of alcohol and drug-involved crime. *Prevention Science* 7(4), 333–342.
- Paim Kessler, F. H., Barbosa Terra, M., Faller, S., Ravy Stolf, A., Carolina Peuker, A., Benzano, D., Pechansky, F., 2012. Crack users show high rates of antisocial personality disorder, engagement in illegal activities and other psychosocial problems. *American Journal on Addictions* 21(4), 370–380.
- Paris, J., Chenard-Poirier, M.-P., Biskin, R., 2013. Antisocial and borderline personality disorders revisited. *Comprehensive Psychiatry* 54, 321-325.
- Pedrero Pérez, E., Puerta García, C., Lagares Roibas, A., Sáez Maldonado, A., 2003. [Prevalence and intensity of personality disorders in substance abusers under treatment in a care facility drug addiction]. *Trastornos Adictivos* 5(3), 241–255.
- Reichborn-Kjennerud, T., Czajkowski, N., Ystrøm, E., Ørstavik, R., Aggen, S. H., Tambs, K., Torgersen, S., Neale, M. C., Røysamb, E., Krueger, R. F., Knudsen, G. P., Kendler, K. S., 2015. A

longitudinal twin study of borderline and antisocial personality disorder traits in early to middle adulthood. *Psychological Medicine* 45, 3121-3131.

Redondo, S., Garrido, V., 2013. [Principios de Criminología]. Barcelona Ed. Tirant lo Blanch

Ribas-Siñol, M., Prado-Sánchez, N., 2015. Troubled adolescents : substance abuse and mental disorder in young offenders 43(6), 197–204.

Roncero, C., Daigre, C., Gonzalvo, B., Valero, S., Castells, X., Grau-López, L., Casas, M., 2013a. Risk factors for cocaine-induced psychosis in cocaine-dependent patients. *European Psychiatry : The Journal of the Association of European Psychiatrists* 28(3), 141–146.

Roncero, C., Daigre, C., Grau-López, L., Rodríguez-Cintas, L., Barral, C., Pérez-Pazos, J., Casas, M., 2013b. Cocaine-induced psychosis and impulsivity in cocaine-dependent patients. *Journal of Addictive Diseases* 32(3), 263–73.

Roncero, C., Daigre, C., Barral, C., Ros-Cucurull, E., Grau-López, L., Rodríguez-Cintas, L., Valero, S., 2014a. Neuroticism associated with cocaine-induced psychosis in cocaine-dependent patients: A cross-sectional observational study. *PLoS ONE* 9(9), 15–17.

Roncero, C., Comín, M., Daigre, C., Grau-López, L., Martínez-Luna, N., Eiroa-Orosa, F. J., Casas, M., 2014b. Clinical differences between cocaine-induced psychotic disorder and psychotic symptoms in cocaine-dependent patients. *Psychiatry Research* 216(3), 398–403.

Schubiner, H., Tzelepis, A., Milberger, S., Lockhart, N., Kruger, M., Kelley, B. J., Schoener, E. P., 2000. Prevalence of attention-deficit/hyperactivity disorder and conduct disorder among substance abusers. *Journal of Clinical Psychiatry* 61(4), 244–251.

Sher, L., Siever, L. J., Goodman, M., Mcnamara, M., Hazlett, E. A., Koenigsberg, H. W., 2015. Gender differences in the clinical characteristics and psychiatric comorbidity in patients with antisocial personality disorder. *Psychiatry Research*, 1–5.

Shorey, R. C., Anderson, S., Stuart, G. L., 2013. The relation between antisocial and borderline personality symptoms and early maladaptive schemas in a treatment seeking sample of male substance users. *Clinical Psychology and Psychotherapy* 21, 341-351.

Tang, Y. L., Kranzler, H. R., Gelernter, J., Farrer, L. A., Cubells, J. F., 2007. Comorbid psychiatric diagnoses and their association with cocaine-induced psychosis in cocaine-dependent subjects. *The American Journal on Addictions / American Academy of Psychiatrists in Alcoholism and Addictions* 16(5), 343–351.

Torrens, M., Serrano, D., Astals, M., Perez-Dominguez, G., Martin-Santos, R., 2004. Diagnosing comorbid psychiatric disorders in substance abusers: validity of the Spanish versions of the Psychiatric Research Interview for Substance and Mental Disorders and the Structured Clinical Interview for DSM-IV. *The American Journal of Psychiatry* 161(7), 1231–1237.

Vergara-Moragues, E., González-Saiz, F., Lozano, O. M., Verdejo García, A., 2013. Psychopathological stability of personality disorders in substance abuse patients treated in a therapeutic community. *Journal of Addictive Diseases* 32(4), 343–53.

Walsh, Z., Allen, L. C., Kosson, D. S., 2007. Beyond social deviance: substance use disorders and the dimensions of psychopathy. *Journal of Personality Disorders* 21(3), 273–288.

Westermeyer, J., Thuras, P., Carlson, G., 2005. Association of antisocial personality disorder with psychiatric morbidity among patients with substance use disorder. *Substance Abuse: Official Publication of the Association for Medical Education and Research in Substance Abuse*, 26(2), 15–24.

Appendix

Table 1: Socio-demographic data

	Total N=143		ASPD n=22 (15.38%)		NO ASPD n= 121(84.61%)		Significance	
	N	%/SD	n	%/SD	n	%/SD		
Age (years)	34.28	±8.01	34.27	±7.95	34.28	±8.05	F =0.28	p=0.594
Sex (men)	117	81.8	18	81.8	99	81.8	na	p=1
Stable couple status	35	24.5	4	18.1	31	25.61	$\chi^2=0.22$	p=0.633
Not finished primary studies	29	20.3	9	40.9	20	16.5	na	p=0.018
Active (employed or studying)	60	42.0	2	9.1	58	47.9	$\chi^2=9.99$	p=0.002
Living alone	16	11.3	5	22.7	11	9.1	na	p=0.074
Ever imprisoned	66	46.2	16	72.7	50	41.3	$\chi^2=6.17$	p=0.013
Age at onset of addiction (years)	24.78	±7.44	22.59	±7.90	25.17	±7.32	F=0.043	p=0.836
Duration of dependence (years)	7.69	±6.97	10.95	±8.30	7.09	±6.57	F=3.79	p=0.053

ASPD- Antisocial personality disorder

-na: Chi-square test was considered not applicable, Fisher's exact test was used.

-Minimum significance after Bonferroni adjustment: $0.05 / 9 = 0.005$

Table 2: Co-morbidities clinical data

		Total N=143		ASPD n=22 (15.38%)		NO ASPD n= 121(84.61%)		Significance	
		N	%/SD	n	%/SD	n	%/SD		
SUD (Abuse or dep.)	Opiates	33	23.1	1 2	54.5	21	17.4	$\chi^2=12.48$	p<.001
	Alcohol	109	76.2	2 0	90.9	89	73.6	$\chi^2=2.217$	p=0.137
	Sedative	25	17.5	1 1	50	14	11.6	na	p<.001
	Cannabis	64	44.8	1 2	54.5	52	43	$\chi^2=0.59$	p=0.441
	Other stimulants	23	16.1	7	31.8	16	13.2	na	p=0.062
	Hallucinogens	41	28.7	9	40.9	32	26.4	$\chi^2=1.26$	p=0.261
Any SUD (ex. cocaine)*		119	83.2	2 1	95.5	98	81	na	p=0.125
Axis I	Major depression	19	13.3	1	4.5	18	14.9	na	p=0.308
	ADHD childhood	42	29.4	1	4.5	41	33.9	na	p=0.004
	Substance induced mood dis.	40	28.0	1 1	50	29	24	$\chi^2=5.035$	p=0.025
	Substance induced psychotic dis.	59	41.25	1 5	68.2	44	36.4	$\chi^2=6.362$	p=0.012
Any axis I		66	46.2	1 2	54.5	54	44.6	$\chi^2=0.391$	p=0.531
Axis II	Borderline (BPD)	34	23.8	1 2	54.5	22	18.2	$\chi^2=11.65$	p=0.001

ASPD- Antisocial personality disorder

SUD- Substances use disorder

ADHD- Attention deficit and hyperactive disorder

BPD- Borderline personality disorder

- na: Chi-square test was considered not applicable. Fisher's exact test was used.

-* This includes any substance moreover of those presented above.

-Minimum significance after Bonferroni adjustment intra vble. SUD: $0.05 / 6 = 0.008$

-Minimum significance after Bonferroni adjustment intra vble. Axis I : $0.05 / 4 = 0.01$

Table 3: Logistical regression of clinical data.

	ASP vs. no ASP				
	Wald	Sig.	OR	95% IC	
SUD Opiates	7.275	0.007	0.219	0.072	- 0.660
SUD Sedative	7.332	0.007	0.203	0.062	- 0.644
ADHD childhood	0.616	0.433	1.635	0.479	- 5.582
Substance induced psychotic dis.	2.505	0.114	0.406	0.133	- 1.239
BPD	6.083	0.014	0.239	0.077	- 0.746

ASP- Antisocial personality disorder

SUD- Substances use disorder

ADHD- Attention deficit and hyperactive disorder

BPD- Borderline personality disorder

HIGHLIGHTS

- Treating patients a Cocaine Dependence co-morbid with an Antisocial Personality Disorder is a complex issue.
- There is limited evidence of the effectiveness of commonly used psychotropic drugs.
- Better assessment and knowledge of individual differences and characteristics of these people, could have important implications for adjusting and improving future treatment programs and to prevent worsening their condition and quality of life.