Crack Cocaine Use in Adolescents:
Clinical Characteristics and Predictors of Early Initiation

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ABSTRACT

Objective: To describe the clinical characteristics of adolescents with crack cocaine dependence and possible predictors of transition from drug experimentation to crack cocaine dependence.

Methods: This cross-sectional study enrolled a consecutive sample of 90 adolescents admitted to a psychiatric inpatient unit in the city of Porto Alegre in southern Brazil for crack cocaine detoxification between May 2011 and November 2012. Comorbid psychological conditions were assessed using the Kiddie-SADS-Present and Lifetime Version, and severity of drug use was assessed using the Teen Addiction Severity Index (T-ASI). Comorbidities were compared with those in a community sample of non–drug using controls (n = 81).

Results: Patients' mean age was 15.6 years (85.6% boys, 14.4% girls). Seventy-nine (93.2%) met criteria for cocaine dependence (*DSM-IV-TR*), while 78 (91.8%) had symptoms consistent with cocaine abuse. All patients had experimented with at least 1 other addictive substance before crack cocaine: 61.4%, tobacco (mean age at first use = 11.61 years); 44.3%, alcohol (age at first use = 12.43 years); and 54.5%, cannabis (age at first use = 12.15 years). Patients had used crack cocaine 23.2 days in the last month, and the mean age at first use of crack cocaine was 13.38 years. The most common psychiatric comorbidity was conduct disorder (81.8%), followed by oppositional defiant disorder (52.3%) and attention-deficit/hyperactivity disorder (44.3%), all of which were more prevalent in the patient population than in controls ($P < .001$). The T-ASI questionnaire showed severe consequences of drug use in most areas of life assessed. The mean time between onset of drug experimentation and crack cocaine dependence was 2.53 (SD = 1.96) years. When Cox regression models were applied, we found that predictors of earlier progression to using crack cocaine were age at first use of any drug (hazard ratio [HR] = 0.79 [95% CI, 0.71–0.88]; $P < .001$) and age at admission (HR = 0.7 [95% CI, 0.57–0.87]; $P = .001$).

Conclusions: Patients were found to have a multitude of comorbid conditions, which supports the idea of treatment by a multidisciplinary health care team. For each year of delay in the age at first drug use, the chance of crack cocaine initiation is reduced by 18%. Prevention programs aimed at delaying experimentation with addictive substances, especially "gateway" drugs, could delay the progression to crack cocaine dependence.

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Substance misuse often begins in adolescence, and early experimentation is a critical factor in the development of substance abuse disorders (SUDs) in adulthood.[1,2] Cocaine is a powerful stimulant, and its use, especially in the smoked form (crack cocaine), is a major public health problem in many countries.[3–5] In the last 2 decades, crack cocaine use in Brazil has increased to an extent that has led some authors to question whether the trend should be classified as an epidemic.[6] Identifying the factors associated with the development of dependence on crack cocaine is crucial in determining the origin of this epidemic. A longitudinal study on the use of alcohol, tobacco, and marijuana[7] demonstrated that the earlier the age at use of any addictive substance, the greater the probability of developing a dependency for that same substance. However, this study did not investigate the evolution toward the use of other drugs, including crack cocaine.

Crack cocaine is a major cause of psychiatric hospitalizations in adolescents in Brazil.[8] However, little is known about the characteristics of adolescents hospitalized for crack cocaine use, or the pattern of comorbidity with other mental disorders. A systematic review[9] of adolescents treated for various SUDs reported high rates of psychiatric comorbidities ranging from 61% to 88%, the highest prevalence of which was *DSM-IV-TR* externalizing disorders. The 10 studies discussed in the review were based on patient samples and included a variety of settings (inpatient, outpatient, and residential programs) and substances of abuse. The use of cocaine, or crack cocaine, was absent in some of the studies and corresponded to less than one third of the population sample in others. While there has been research associating the use of crack cocaine with impairment on

Clinical Points

- Adolescent crack cocaine dependence is an important problem worldwide, and there is a need for greater knowledge of the clinical profile of teenage crack cocaine users.
- Adolescents who present with crack cocaine dependence have a very high prevalence of psychiatric comorbidities and functional impairments in multiple areas of daily living.
- Earlier initiation of any substance use predicted earlier progression toward crack cocaine abuse and dependence.

multiple levels in adults,[10,11] little is known about the extent of comorbid impairments in adolescent crack cocaine users.

The objectives of this study were to (1) describe the clinical and sociodemographic characteristics of a sample of adolescents hospitalized for problems related to crack cocaine use, compared to a control group of non–drug using adolescents; (2) analyze the level of severity of drug use in adolescent crack cocaine users in the spheres of substance use, school, family, social relationships, work, legal, and psychiatry; and (3) determine whether an earlier age of first use of addictive substances influences the age at first use of crack cocaine.

METHODS

This was a cross-sectional study, in which patients (crack cocaine addicts) were consecutively enrolled from 2 psychiatric inpatient units for adolescents in the city of Porto Alegre, in southern Brazil, from May 2011 to September 2012. The control subjects were selected from a low-income neighborhood in the city of Canoas, Rio Grande do Sul, Brazil. The study protocol was approved by the Research Ethics Committee of the Hospital de Clínicas de Porto Alegre and by the hospitals where the patients were hospitalized. All participants assented to participate in the study, and their legal guardians consented to their participation by signing an informed consent form.

Participants

Patients. Inclusion criteria were as follows: patients between the age of 12 and 18 years, referred for psychiatric hospitalization as a result of problems related to crack cocaine use in 1 of the 2 inpatient units that specialize in psychiatric care of adolescents in the city of Porto Alegre, Brazil; urine drug screen (UDS) positive for cocaine metabolites. Exclusion criteria were as follows: UDS negative for cocaine; psychotic symptoms or other problems that may hinder clinical evaluation. Overall, 4 potentially eligible patients were not included: 1 for psychosis, 2 for UDS not confirming recent crack cocaine use, and 1 for refusal to participate.

Controls. Controls were selected from a community sample in the same area as the hospital units cited above. They were recruited from the files of a public health clinic that have data from all families living inside that neighborhood, even those who never had a consultation on that clinic. Adolescents (12–18 years of age) residing in that area were randomly selected to be interviewed. Sampling method was described in a report of another study from our group.[12] The only exclusion criterion for controls was self-reported use of psychoactive substances. Only 1 individual was excluded for this reason. Controls were not matched with the patients by demographic characteristics.

Diagnostic Procedures

The presence of psychiatric diagnoses for both patients and for controls were assessed by the following process: (1) a semistructured interview—the K-SADS-PL (Kiddie-SADS-Present and Lifetime Version),[13,14] conducted by trained medical assistants (κ average for all diagnoses = 0.79); (2) discussion of the interview results with a child and adolescent psychiatrist (T.G.P.); and (3) diagnosis of psychiatric disorders (other than SUD) confirmed by clinical interview with T.G.P. Only the resulting diagnosis from this third step was considered. The patients were reviewed in their respective hospital units and the controls were reviewed in their homes. All diagnoses were made using *DSM-IV-TR* criteria.

The Brazilian Portuguese version of the Teen Addiction Severity Index (T-ASI) was used in the patient group only.[15,16] T-ASI assesses the characteristics and the severity of drug abuse in the context of 7 life areas (substance use, school, family, social relationships, work, legal, and psychiatric status). To summarize the severity of substance use in the past 30 days, the interviewer assigns a severity rating to each life area. This instrument provides scores from 0 to 4, 50% of which corresponds to the objective data assessed during the patient interview and the other 50%, to the evaluation of the patient in regard to the severity of the respective problem. We also calculated the weighted score for each assessed life area by utilizing the procedure described by Brodley et al.[17] Data on the first use of each drug were collected based on the age at first use (AFU), as reported by the patients in the T-ASI. Demographic variables—age, gender, ethnicity, education, social class, and others—were systematically collected.

Statistical Analysis

The normality of the variables was assessed using the Shapiro-Wilk test. Comparisons between groups were performed using the Student *t* test or Mann-Whitney *U* test, according to whether the respective distribution of scores was normal or nonnormal. χ^2 Test was used for categorical variables.

Evaluation of possible predictors of early drug use was performed using the Cox survival analysis. Variables related to clinical and demographic characteristics were tested in univariate analyses regarding their association with the outcome variable (AFU of crack cocaine). Variables associated with a $P < .2$ were entered in the final multivariate model. All analyses were performed with PASW v18.0 (IBM Co, Armonk, New York).

Table 1. Sociodemographic Data of Adolescents Hospitalized for Crack Cocaine Use (n =) and Community Controls (n = 81)[a]

	Cases (n = 90)	Controls (n = 81)	Test Statistic	P
Gender			$\chi^2 = 14.67$	< .001
Male	77 (85.6)	33 (40.7)		
Female	13 (14.4)	48 (59.3)		
Race				
Caucasian	47 (52.2)	67 (82.7)	$\chi^2 = 20.854$	< .001
Non-Caucasian	43 (47.8)	12 (14.8)		
Socioeconomic status				
High income	7 (7.7)	23 (28.4)	$\chi^2 = 10.241$	< .001
Middle income	56 (64.4)	51 (63.0)		
Low and lowest income	24 (27.5)	7 (8.6)		
Parents living together	13 (15.9)	35 (64.8)	$\chi^2 = 34.176$	< .001
Age, mean (SD), y	15.6 (1.4)	14.7 (1.5)	$U = 2{,}401$	< .001
Years of school completed, mean (SD)	4.23 (1.7)	6.99 (2.2)	$U = 5{,}618$	< .001

[a]Categorical data presented as n (%).

Table 2. Use of Other Psychoactive Substances in Adolescents Hospitalized for Crack Cocaine Use (n = 85)

Substance	Current, n (%)[a]	Lifetime, n (%)[b]	Age at First Use, Mean (SD), y	Days of Use, Mean (SD)[c]
Alcohol	37 (43.5)	71 (83.5)	12.4 (2.3)	8.8 (9.7)
Tobacco	79 (92.9)	80 (94.1)	11.6 (2.5)	27.4 (7.2)
Cannabis	52 (61.2)	77 (90.6)	12.1 (2.4)	13.6 (12.3)
Inhalant	5 (5.9)	29 (34.1)	12.4 (2.1)	8.2 (12.3)
Hallucinogens	0	4 (4.7)	13.7 (2.7)	0
Ecstasy	0	2 (2.4)	16 (1.4)	0

[a]Use in the last 30 days prior to the hospitalization.
[b]Any drug use in previous years.
[c]Number of days of use in the 30 days prior to hospitalization.

RESULTS

A total of 90 patients and 81 controls were included. There were more males (85.6% vs 40.7%, $P < .001$) and non-Caucasians (47.9% vs 14.8%, $P < .001$) in the patient group compared to the control group. Other demographic characteristics are described in Table 1.

Clinical Description of the Crack Cocaine Group

Drug use. In the past 30 days, crack cocaine was smoked on a mean of 23.36 days (SD = 1.1), and the majority of the sample (63/85, 72.4%) had smoked crack cocaine in more than 20 of the last 30 days. No use of amphetamines or derivatives of opiates was reported. Two patients reported lifetime, but not current, ecstasy use. Regarding the use of cocaine and crack cocaine, 55 patients (64.7%) reported both snorting and smoking cocaine in the same period of time. All patients had experimented with at least 1 other addictive substance before crack cocaine: 61.4%, tobacco, 44.3%, alcohol; and 54.5%, cannabis. Current use prevalences and age of initiation are shown in Table 2. Among those who smoked tobacco, 84% reported smoking more than 10 cigarettes per day. Among those who smoked tobacco, 84% reported smoking more than 10 cigarettes per day.

The mean AFU of any psychoactive substance was 10.8 (SD = 2.2) years. On average, patients took 2.52 (SD = 1.96) years to progress from that point to experimenting with crack cocaine.

Table 3. Comorbidity Profile in Adolescents Hospitalized for Crack Cocaine Use (n = 88) Compared to Community Controls (n = 81)[a]

	Current			Lifetime		
Disorder	Cases	Controls	P	Cases	Controls	P
ADHD	35 (39.8)	8 (9.9)	< .001	39 (44.3)	8 (9.9)	< .001
ODD	45 (51.1)	8 (9.9)	< .001	46 (52.3)	8 (9.9)	< .001
Conduct disorder	66 (74)	1 (1.2)	< .001	72 (81.8)	1 (1.2)	< .001
Any mood disorder	13 (14.8)	1 (1.2)	< .001	20 (22.7)	2 (2.5)	.001
Major depression	12 (13.6)	1 (1.2)	.002	16 (18.2)	2 (2.5)	.001
Dysthymia	0	0		1 (1.1)	0	
Bipolar disorder	3 (3.4)	0		6 (6.8)	0	
Any anxiety disorder	27 (30.7)	11 (13.6)	< .001	41 (46.6)	12 (14.8)	.008
Generalized anxiety disorder	10 (11.4)	0		10 (11.4)	0	
Simple phobia	7 (8.0)	6 (7.4)	.912	9 (10.2)	6 (7.4)	.536
Social phobia	5 (5.7)	4 (4.9)	.845	6 (6.8)	4 (4.9)	.619
OCD	5 (5.7)	0		6 (6.8)	0	
Panic disorder	2 (2.3)	1 (1.2)	.617	3 (3.4)	1 (1.2)	.359
PTSD	5 (5.7)	3 (3.7)	.546	12 (13.6)	3 (3.7)	.023
Alcohol use disorder	12 (13.6)	0		14 (15.9)	0	
Enuresis	2 (2.3)	1 (1.2)	.617	11 (12.5)	4 (4.9)	.089
Tic disorder	1 (1.1)	1 (1.2)	.952	2 (2.3)	1 (1.2)	.610
Any comorbidity	77 (87.5)	17 (21.0)	< .001	87 (98.9)	18 (22.2)	< .001

[a]Values expressed as n (%) unless otherwise noted.
Abbreviations: ADHD = attention-deficit/hyperactivity disorder, OCD = obsessive-compulsive disorder, ODD = oppositional defiant disorder, PTSD = posttraumatic stress disorder.

Considering the diagnoses derived from *DSM-IV-TR*, 79 patients (92.9%) met the criteria for crack cocaine dependence (mean of 4.7 of 8 symptoms, SD = 1.8), while 78 (91.8%) had symptoms consistent with crack cocaine abuse (mean of 2.28 of 6 symptoms, SD = 1.02). Two patients denied having symptoms of abuse or dependence for this substance, despite their positive UDS and being hospitalized for this reason. In terms of subspecifiers for these diagnoses, 54 (62.1%) reported significant physiological dependence.

Psychiatric diagnoses. A comorbid psychiatric diagnosis was present in 87.5% of cases at the time of the evaluation, and 98.9% had a lifetime psychiatric diagnosis. The most prevalent comorbidities among the patients were conduct disorder (CD), oppositional defiant disorder, and attention-deficit/hyperactivity disorder. See Table 3 for a complete description, including controls' comorbidities and *P* values. Those comparisons are uncontrolled. We also analyzed the pattern of comorbidity adjusting for demographic variables (gender, race, age, socioeconomic status, education). Significance of findings did not change (available upon request).

T-ASI in the Patient Group

Selected findings of the T-ASI are detailed in Table 4. There were significant correlations between the interviewer severity rating and the weighted scores in the areas of substance use ($r = 0.210$, $P = .05$), school ($r = -0.234$, $P = .028$), family ($r = 0.448$, $P < .001$), social relationships ($r = 0.507$, $P < .001$), legal ($r = 0.880$, $P < .001$), and psychiatric status ($r = 0.615$, $P < .001$). There was

Table 4. Results From T-ASI Interview (n = 88)

Item	Value
Categorical data	n (%)
Currently in school	13 (14.8)
Has a profession	30 (33.7)
Neither studying nor working	16 (18.2)
Lives with both parents	10 (11.4)
Was beaten at home	19 (21.6)
Was sexually abused at home	1 (1.3)
Has friend who uses cocaine	28 (41.8)
Has been arrested	35 (39.8)
Had previous psychiatric treatment	15 (17)
Problems with controlling aggressive behavior	14 (15.9)
Had suicidal ideation	10 (11.4)
Attempted suicide	9 (10.8)
Continuous data	Mean (SD)
Age at drug use onset, y	10.8 (2.22)
Days of crack cocaine use in the last month	23.36 (10.3)
Age at crack cocaine initiation, y	13.3 (2.20)
Years of crack cocaine use	2.16 (1.64)
Years of any drug use	4.65 (2.21)
Years from first drug use to onset of crack cocaine use	2.52 (1.96)
Time since leaving school, mo	27.8 (18.26)
% of earnings that are illegal	56.38 (43.5)
Days of skipping school (last 30 days)[a]	18.48 (13.5)

Life area	Composite Score, Mean (SD)	Severity Score, Mean (SD)	Spearman Correlation	*P*
Substance use	0.23 (0.08)	3.92 (0.27)	0.210	.05
School	0.98 (0.21)	3.33 (1.26)	−0.23	.028
Employment	NA	1.33 (1.74)	NA	NA
Family	0.36 (0.18)	2.53 (1.48)	0.448	< .001
Social relationship	0.29 (0.15)	0.75 (1.28)	0.507	< .001
Legal	0.17 (0.24)	1.35 (1.55)	0.880	< .001
Psychiatric	0.15 (0.23)	0.9 (1.4)	0.615	< .001

[a]For subjects currently in school.
Abbreviations: NA = not applicable, T-ASI = Teen Addiction Severity Index.

a high prevalence of problems with the law (n = 35, 39.8%) and illegal activities, which accounted for an average of 56.38% (± 43.5) of the family income.

Age at First Use of Any Drug and of Crack Cocaine

The AFU of any drug was related to AFU of crack cocaine in the univariate Cox regression model (hazard ratio = 0.79; 95% CI, 0.71–0.88; $P < .001$). In the multivariate model (Table 5), besides AFU of drugs (independent variable), the following potential confounders were selected using the statistical criteria explained above ($P < .2$ for associations with both AFU of drugs and AFU of crack cocaine): current age, presence of early-onset CD (before 10 years of age), presence of any anxiety disorder before the start of drug use, and marijuana as the first drug used. This second model showed hazard ratios of 0.82 (95% CI, 0.7 to 0.97; $P = .018$) for the AFU of drugs and 0.7 (95% CI, 0.57–0.87; $P = .001$) for current age, while the remaining variables were not considered significant. That is, for each year of delay in the age of first use, the chance of crack cocaine initiation is reduced by 18%.

Table 5. Cox Regression for Age at First Crack Cocaine Use (n = 85)[a]

	HR	95% CI	*P*
Model 1: Unadjusted			
Age at first use of drugs	**0.79**	**0.71–0.88**	**< .001**
Model 2: Adjusted for covariates listed			
Age at first use of drugs	**0.82**	**0.7–0.97**	**.018**
Age of the patient when hospitalized	**0.7**	**0.57–0.87**	**.001**
Early conduct disorder	0.92	0.51–1.67	.81
Cannabis use before crack	0.83	0.48–1.44	.52
Any anxiety disorder before crack	1.1	0.69–1.187	.61

[a]Boldface indicates statistical significance.
Abbreviation: HR = hazard ratio.

DISCUSSION

In this study, we evaluated a sample of hospitalized adolescent crack cocaine users. We found a high prevalence of psychiatric comorbidities and significant drug-related impairments, comparable to those found in adults.[10,18] Adolescents also reported an earlier age at onset for use of any type of drug, as well as an earlier transition to crack cocaine, than reported in comparable data from adult samples.[19] There is no consensus on what constitutes early age at onset of drug abuse. It has been defined as onset prior to 13 years of age,[20] between 13 and 16 years of age,[21] before 14 years of age,[22] and before 15 years of age.[23,24] By any of those definitions, patients in our sample started using drugs at a very early age.

The early AFU of any drug has been associated with progression to cocaine and crack cocaine abuse. Kandel and Yamaguchi[1] showed that adolescents who progressed from alcohol and tobacco to crack cocaine and cocaine began using legal addictive substances on average 2 years before those who continued the use of only alcohol or tobacco. In line with this study, most of our patients began using alcohol, tobacco, or marijuana before using crack cocaine. In Brazil, alcohol and tobacco use is illegal under 18 years of age, and marijuana is illegal at any age. We noted that 71% of our patients had smoked other substances before smoking crack cocaine. This suggests that history of smoking any substance may facilitate crack cocaine use, possibly because of the process and effort involved in learning how to smoke and the desensitization to the noxious effects of smoke inhalation. Additionally, 69.3% of patients had used some type of legal addictive substance before using crack cocaine, potentially because of the greater availability and lesser stigma associated with legal substances. Unlike that of Kandel and Yamaguchi,[1] our sample had a significant proportion (30.7%) of adolescents who used marijuana, without having used alcohol or tobacco, before they began smoking crack cocaine. There were no patients in our sample who started using cocaine or crack cocaine without having first used another substance. This reinforces the hypothesis that the use of so-called hard drugs is usually preceded by the use of other substances and drugs of abuse, such as alcohol, tobacco, or cannabis, often considered "gateway drugs."[25–27] Whether this association is due to the gateway phenomenon or is a consequence of differential availability of such substances remains a subject of active research.[28,29]

We found that earlier onset of any drug use corresponded to earlier first use of crack cocaine. Several

reports in the literature have shown that earlier AFU relates to a higher probability of developing dependence and other impairments. A cross-sectional study[30] showed that drug use before the age of 15 was related to the diagnosis of SUD in early adulthood and was also associated with a more severe degree of dependence. A study of twins demonstrated that the use of marijuana before age 17 was predictive of an up to 4 times higher risk of cocaine dependence, when compared to that in twins who did not use until 17 years of age.[26] A longitudinal study[7] on the use of tobacco, alcohol, and cannabis showed that early use of these substances predicted a greater chance of developing dependence on those same drugs. Our study differs from that study in its cross-sectional design and in its evaluation of the relationship between different drugs, ie, the first use of other drugs in relation to crack cocaine dependence, which was not assessed in the longitudinal study. In addition, an important contribution of our study was the ability to control our findings in regard to the presence of psychiatric comorbidities (CD and the presence of any anxiety). However, these psychiatric comorbidities did not show any significant influence on predicting the first use of crack cocaine in adolescents. Another study indicated that the first use of cocaine or crack cocaine during adolescence was responsible for a 50% increase in the risk of developing dependence in the subsequent 2 years.[31] The early use of cocaine and crack cocaine was related to a higher number of sexual partners in the subsequent years, along with a lower probability of using condoms,[32] which may also influence the incidence of clinical comorbidities.

We found a higher prevalence of psychiatric comorbidities than has been previously reported in comparable populations.[9] Almost all patients had a lifetime psychiatric diagnosis (98.9%), while prior studies of hospitalized patients found the prevalence of psychiatric comorbidities to be between 64% and 78%.[33–38] Some studies found a higher prevalence of mood disorders than we did (up to 65% in some,[9] vs 23.4% in ours). However, certain important methodological differences may limit the comparability of these data. An important distinction between our study and others cited here is that the other studies evaluated samples in which only a small portion of the patients had used cocaine or crack cocaine. In this regard, it is noteworthy that our study is the first to select a consecutive sample composed exclusively of patients who used crack cocaine. Selecting patients based on their drug of choice seems to be the logical approach, if the aim is to enhance scientific knowledge of this specific patient profile in order to assist in their clinical treatment. In this scenario, we can see crack cocaine–using adolescents as individuals with a myriad of psychiatric needs; treatment should be tailored to their comorbid conditions as well. Another important difference in our study design is the diagnostic methodology. We used a semistructured interview followed by a clinical interview. The methods used for psychiatric diagnosis in the cited studies were as heterogeneous as the results presented, ranging from clinical interviews to the use of structured interviews.

There are still relatively few published studies on drug dependence in adolescents that used the T-ASI questionnaire to measure the degree of severity of SUD and the respective consequences in the different areas assessed. When compared to the data obtained in the study that validated T-ASI in this population by Sartes et al,[16] we found higher scores in the areas of substance use and school in our sample of adolescent crack cocaine users compared to users of other substances reported in Sartes et al, while all other areas had similar scores. Poor academic performance has been already extensively associated with drug use in general,[37,38] but our study shows even higher academic impairment in patients with crack cocaine dependence.

Our study has several limitations. Its cross-sectional design precludes us from establishing causality between AFU of any drug and age at crack cocaine initiation. We used retrospective data to establish AFU of substances; however, the time that elapsed between the AFU and the time of data collection was brief, minimizing a potential recall bias. Diagnosis of comorbidities did not incorporate third-party information from parents and teachers (school dropout was high in the patient group). However, we believe that this does not compromise the results, as psychiatric examination of the patient is usually the primary source of diagnostic information in adolescent psychiatric diagnosis.[39] The control group was not matched to patients on relevant demographic characteristics. Additionally, comparisons to a control group of adolescents who use other substances would allow for greater insight as to the differential impairment and psychiatric comorbidity profiles.

In conclusion, adolescent crack cocaine users have significant impairment in multiple aspects of life, requiring multidisciplinary and specialized approach to treatment. The influence of age at onset of any drug use on the onset of crack cocaine use suggests that primary prevention of any substance abuse is key to reducing the incidence of crack cocaine abuse and dependence in this population.

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