

Differences in Criminal Activity Between Heroin Abusers and Subjects Without Psychiatric Disorders—Analysis of 578 Detainees in Bilbao, Spain

REFERENCE: Morentin B, Callado LF, Meana JJ. Differences in criminal activity between heroin abusers and subjects without psychiatric disorders—analysis of 578 detainees in Bilbao, Spain. *J Forensic Sci* 1998;43(5):993–999.

ABSTRACT: The association between drug abuse and criminal activity has been deeply established, but the nature of this relationship is controversial. The incidence and types of criminal activity were analyzed in 837 arrests of 578 subjects who were also interviewed for psychiatric diagnosis and evaluation of criminal responsibility. There was a significant prevalence of heroin abuse/dependence (50.5 %) in the sample. Another 124 subjects (21.5 %) in whom no psychiatric disorder could be observed were considered as the control group. Heroin abusers were younger (26 years, SD 5.9) than controls (29 years, SD 11.2) and showed some different ethnic characteristics. Heroin abuse/dependence was the most important risk factor (O.R. = 10.15) for criminal recidivism. Females were more related to nonviolent criminal activity than males. There was a higher incidence of offenses against property among heroin abusers (burglary 57.8%; robbery 19.5%) than in the control group (burglary 15.3% robbery 4.8%). In contrast, aggression or resistance to police authorities and nonfatal offenses against persons were more frequent among controls (12% and 13.7%, respectively) than among heroin abusers (3.7% and 3%, respectively). The results of this study confirm the hypothesis of a relationship between criminal activity and heroin abuse/dependence, probably based on financial needs. However, the association seems not to be a single and direct cause-effect relationship, as other factors show influence on the criminal activity.

KEYWORDS: forensic science, forensic psychiatry, substance abuse, heroin dependence, delinquency, criminal behavior

A high prevalence of abuse and/or dependence on illegal drugs in samples of criminal offenders has been described (1–4). At the same time, an important number of arrests have also been observed among users of illegal drugs and especially among opioid users (5–15). Although the association between substance abuse and criminal activity is widely recognized, the nature of the association is still under debate. Demographic characteristics such as age, sex and ethnic origin seem to exercise an important influence on the incidence and type of criminal activity among subjects who are consumers/abusers of illegal drugs (5,8–10,16–18). The hypothesis of a cause-effect relationship between drug dependence and

criminal activity is based on the evidence of a greater level of criminal activity among drug addicts during phases of active addiction, whereas this level decreases during periods of abstinence (8,9). In relation to this hypothesis, a decrease in the level of criminal activity has been described following the beginning of methadone treatment among heroin addicts (10,11). However, other authors maintain that there is no sole and direct causality relation between the consumption of illegal drugs and crime (12–14,19). This hypothesis maintains that both conducts are contemporary in time and that they emerge from a series of factors and from certain particular personality features (12–14,19).

The study of the association between drug abuse/dependence and criminal activity has encountered important methodological problems, such as the difficulty of measuring the level of criminal activity, the finding of a significant sample of substance abusers and the absence of suitable control groups. Thus, most studies have exclusively examined drug users/abusers in prison (1–4,18,22–24) or drug-dependent subjects undergoing treatment (6–11). In this regard, it has also been advised that the criminal activity of heroin users should be compared with control groups of nonconsumers of illegal drugs showing criminal activity (12).

The purpose of this study was initially to analyze the prevalence of heroin abuse/dependence in a sample group of criminal offenders arrested in Bilbao, Spain. The criminological characteristics of the heroin-abusing criminal offenders were compared with those of a group of detainees arrested during the same period and who had no psychiatric disorders. Demographic variables such as age, sex and ethnic origin were analyzed between the different groups for the purpose of studying the possible influence on the criminological aspects evaluated.

Subjects, Materials and Methods

This study was based on 837 interviews carried out over a period of seven months in the geographic area of Bilbao, Spain. This area, of an urban-industrial nature, has an approximate population of 520,000. The interviews were conducted in the Bilbao Clinic of Forensic Medicine when the subject, having been arrested for an offense was presented before the Bilbao Duty Magistrate's Court (*Juzgado de Guardia*). In the period, between 95% and 98% of those arrested gave their consent and were later interviewed by a forensic doctor for a psychiatric examination and evaluation of criminal responsibility state, as well as for medical examinations in the event of allegations of police ill-treatment. The following variables were noted for this study: demographic (sex, age, racial/ethnic origin), psychiatric (principal psychiatric diagnosis) and criminological (number of times arrested previously, number

¹ Clinic of Forensic Medicine, Bilbao, Spain.

² Department of Pharmacology, University of the Basque Country, Leioa, Bizkaia, Spain.

³ Institute for Drug Dependence, University of Deusto, Bilbao, Spain.

Received 8 July 1997; and in revised form 2 Oct. 1997 and 5 Dec. 1997; accepted 17 Dec. 1997.

of times examined during the seven months of the study and type of offense for which they were arrested).

The principal psychiatric diagnosis was based on the DSM III-R diagnostic criteria (20) and was made on the basis of a psychiatric interview and the medical history filed in the Bilbao Clinic of Forensic Medicine. When there were doubts as to the diagnosis, the diagnosis was complemented with information obtained from the medical centers where the arrestee was under treatment (mainly detoxification treatment centers and mental health centers) and a toxicological urine analysis for abuse drugs. In cases in which there coexisted a heroin abuse/dependence disorder (heroin alone or heroin in association with other drugs) and a personality disorder, in general the former was considered to be the principal diagnosis. Among subjects who had been arrested/interviewed on more than one occasion, in four cases there was no homogeneity of diagnosis at the data gathering phase. In these cases a later evaluation was made of the diagnoses, as shown in the Results section.

Evaluation of the number of previous arrests was based on information provided by the detainee and on records in the archives of the Clinic of Forensic Medicine. Unlike the legal criterion, a recidivist was considered to be a person who had been arrested on at least five previous occasions (21). Since the study took place over a period of time, there were cases of persons who were arrested on more than one occasion during the study period and although at the first interviews they were not recidivists, at the next one they were. In all such cases, the subject was registered as a recidivist.

The offenses were categorized in accordance with the Spanish Criminal Code, which in relation to this study, specifies the following offenses:

1. Offenses against the person
 - Murder
 - Sexual offenses
 - Nonfatal offenses (assault, battery)
2. Offenses against property
 - Robbery with assault or battery, (use of force against persons or threatened use of force in order to steal)
 - Burglary (theft, breaking and entering, house breaking)
 - Theft not involving the use of violence, threat or force (larceny, pick-pocketing)
 - Taking a conveyance without authority (not intention permanently to deprive)
 - Fraud
3. Drug distribution (sales of all illegal drugs or dealing, buying for others or supplying; mere drug use or possession is not included)
4. Offenses against public order
5. Aggression/resistance to police authorities (resisting arrest, assault of police officers in the course of their duties)
6. Others (selling or receiving stolen goods, illegal use of arms, arson, etc.)

In this study, the 578 detainees were separated into different groups. One of the groups included subjects with heroin abuse/dependence (in association with other drugs or not). In order to study whether this group has distinct socio-demographic and criminological characteristics it was compared with another group which

included subjects in which, on the basis of the interview and medical records, no mental disorder or abuse of psychoactive substances was detected. A third group consisted of subjects showing evidence of psychiatric disorders other than heroin abuse/dependence.

The results are expressed as means (standard deviation) of individual values or as percentages. The age variable was coded into three groups: 16 to 20 years, 21 to 30 years and over 30. Three groups of racial/ethnic origin were distinguished: Caucasians of Spanish origin, Gypsies of Spanish origin, and non-Spanish nationals (mainly from Northern and Central Africa). In Spain, Gypsies and foreigners from the Third World constitute the two main ethnic minorities subjected to marginality.

The χ^2 test was used in the statistical study in order to evaluate the different demographic and criminological characteristics between the heroin abuse/dependence and the nonmental disorder groups. The quantitative variables (age, total number of arrests, and number of each offense committed by each subject) were compared using Student's *t* test. The recidivism parameter was studied using logistic regression (i.e., odds ratio not contained in 95% confidence interval). The multiple variance method was used to analyze the types of offense and the total number of offenses/interviews. Only offenses representing a frequency of over 5% of the total were analyzed. The statistical significance level chosen was $p < 0.05$. All analyses were carried out using the SPSS (Statistical Package for Social Sciences) program.

Results

The sample shown in this study was made up of 578 persons examined by a forensic doctor when the arrestee was presented before the Court. Of the subjects, 50.5% (292 persons) followed a pattern of heroin abuse/dependence (heroin alone or heroin associated with other types of drugs); in 21.5% of the subjects (124 persons) there was no drug abuse/dependence or other mental disorder; and 102 subjects were diagnosed for some other type of mental disorder (including abuse/dependence or intoxication related to other types of drugs and ethanol). In another 60 subjects, a clear diagnosis could not be obtained. In four cases, due to the fact that different examinations by forensic doctors had provided different diagnoses, a review of the diagnostic criteria was made. Two subjects had been diagnosed as having no psychiatric disorder in one examination and abuse of multiple substances (including heroin) in others. Given that in none of these cases was withdrawal syndrome or tolerance phenomenon observed and the urine toxicology proved negative to heroin, these subjects were not included in the group of heroin abusers/dependants. Another subject was considered in two examinations to have a principal diagnosis of paranoid schizophrenia and in another two was given a diagnosis of heroin dependence. Given that in no examination were signs of psychotic disturbance observed, the principal diagnosis was considered to be heroin dependence and the secondary diagnosis to be remitting paranoid schizophrenia. Another subject received a diagnosis of heroin abuse in two examinations and of antisocial personality disorder in another. In this specific case, for this study the antisocial personality disorder was considered to be the principal diagnosis on the basis of the severity of the disorder.

The demographic characteristics of the overall sample are shown in Table 1. There is a high frequency of males (86.3%) and Caucasians (74.9%) (as would correspond to the general population of the area studied) and there is a relatively low average age (28; standard deviation [SD] = 8.7 years).

A comparison of the demographic characteristics of the group

TABLE 1—Demographic, psychiatric and criminological variables of the groups.

	Total Examined N	Heroin Abuse/Dependence n (%)	No Psychiatric Disorder n (%)	χ^2 (P)	Other Mental Disorder or Unknown n (%)
Sex				0.79 (n.s.)	
Male	499	249 (49.8)	102 (20.4)		148 (29.7)
Female	79	43 (54.4)	22 (27.8)		14 (17.8)
Age(years)				9.69 ($p < 0.01$)	
16–20	115	59 (51.3)	27 (23.5)		29 (25.2)
21–30	282	165 (58.5)	51 (18.1)		66 (23.4)
>30	162	61 (37.6)	41 (25.3)		60 (37.0)
Not indicated	19	7	5		7
National/Ethnic Identity				42.97 ($p < 0.001$)	
Spanish Caucasian	433	215 (49.7)	85 (19.6)		133 (30.7)
Spanish Gypsy	68	56 (82.4)	5 (7.3)		7 (10.2)
Non-Spanish nationals	73	18 (24.6)	34 (46.6)		21 (28.7)
Not indicated	4	3	0		1
Recidivism				81.05 ($p < 0.001$)	
Yes	210	165 (78.6)	11 (5.2)		34 (16.2)
No	366	127 (34.7)	113 (30.9)		126 (34.4)
Not indicated	2	0	0		2
Interviews Per Person				29.97 ($p < 0.001$)	
One	473	206 (43.6)	118 (25.0)		149 (31.4)
2–4	84	68 (81.0)	6 (7.1)		10 (11.9)
5–16	21	18 (85.7)	0		3 (14.3)

N and n represent the absolute number of persons in each group. The percentage in each psychiatric group is calculated as percentage ($n \times 100/N$) of the total number of subjects examined (N) for this demographic or criminological characteristics. P represents the probability value obtained by a χ^2 analysis on comparing the demographic and criminological variables between the group with heroin abuse/dependence and the group without psychiatric disorders. n.s. = no significant differences between groups.

of arrestees with heroin abuse/dependence disorder and the group of arrestees without mental pathology is shown in Table 1. No statistically significant differences on gender grounds may be observed. The average age of subjects with heroin abuse/dependence was significantly less (26, SD = 5.9 versus 29, SD = 11.2 years; $t = 3.01$; $p < 0.01$). The age range in the first group was 16 to 47 years whereas among those not suffering psychiatric disorder its was from 16 to 70 years. There were also statistically significant differences in racial/ethnic origin between the two groups (Table 1). A very high rate of heroin abuse/dependence among racial gypsy subjects was observed, while the frequency of detainees without mental pathology was quite high in the non-nationals group. For the purpose of analyzing whether the differences observed in age and ethnic origin between the two groups might be due to a simple association between the two demographic factors or whether on the contrary they were unrelated variables, a stratified (sequential) analysis was made using χ^2 . When subjects of Caucasian origin were considered on their own, statistically significant differences were found between the ages of the groups analyzed ($\chi^2 = 13.26$, $df = 2$; $p < 0.01$). The average age of Caucasian subjects with heroin abuse/dependence was 27 (SD 5.8) and for Caucasian subjects without psychiatric pathology it was 30 (SD 12.1) ($t = 2.44$; $p > 0.05$). Among subjects of other ethnic identities, there was no significant difference in age between the two groups analyzed. In summary, for the majority ethnic group in this study (Caucasians), subjects with heroin abuse/dependence interviewed were relatively younger than the group without psychiatric disorder used as control. The high level of heroin abuse/dependence among subjects of gypsy ethnic origin does not seem to be due to the existence of younger individuals in this group.

There was an overall frequency of recidivism of 36.3% (210 arrestees). Comparison of this percentage among the two groups analyzed shows it to be considerably higher among subjects with

TABLE 2—Risk factors for recidivism.

Risk Factor	Odds Ratio	95% Confidence Interval
Sex		
Male	3.09	1.54–6.18
Female	1.0	...
Age(years)		
16–20	0.94	0.53–1.70
21–30	1.0	...
>30	0.53	0.31–0.95
National/Ethnic Identity		
Spanish Caucasian	1.0	...
Spanish Gypsy	1.52	0.80–2.91
Non-Spanish nationals	0.47	0.20–1.11
Psychiatric Diagnosis		
Heroin abuse/dependence	10.15	5.11–20.19
No psychiatric disease	1.0	...

Risk factor values have been obtained using application of multiple logistic regression analysis (method of backward stepwise). The analysis was carried out on the 416 subjects included in the heroin abuse/dependence group and the group with no psychiatric disorder.

heroin abuse/dependence than among the group of arrestees without psychiatric pathology (56.5% compared to 8.9%; $p < 0.001$) (Table 1). An analysis using multiple logistical regression in order to evaluate the influence of demographic and psychiatric variables indicated that the main risk factor for recidivism was the fact of belonging to the heroin abuse/dependence group (Table 2). Thus the fact of suffering a heroin abuse/dependence disorder presents a variable risk of recidivism 10.15 times higher for those who suffered no psychiatric disorder. Another risk factor in recidivism was that of being male, with a risk 3.09 times higher than for females (Table 2). The influence of the age variable was less decisive and only indicated that belonging to the group of individuals

over 30 may be a factor of relative protection against recidivism. No special risk of recidivism was associated with the different ethnic groups (Table 2).

The number of interviews per person is shown in Table 1. It is worth noting that subjects with heroin abuse/dependence represented more than 80% of detainees evaluated on more than one occasion. By contrast, subjects without psychiatric disorders had a low presence in the group of those interviewed and examined between 2 and 4 times and were not represented among the group of those interviewed and examined on five or more occasions (Table 1). The 578 subjects detained were assessed on a total of 837 occasions, representing an average of 1.44 (SD = 1.38) offenses (or examinations/interviews) per person. This figure was noticeably higher among the group with heroin abuse/dependence than among the group with no psychiatric disorder (1.75, SD = 1.80, compared to 1.07, SD 0.37; $t = 6.17$; $p < 0.001$).

In order to ascertain the influence of the different demographic and psychiatric variables on the number of offences committed, taking into account in all cases possible interaction between these variables, a multi-factorial analysis was conducted. This analysis was carried out on the 416 subjects included in the two diagnostic groups under consideration and demonstrated that the main variable associated with the number of arrests/interviews per person was the psychiatric diagnosis (Table 3). Thus, subjects with heroin abuse/dependence showed a higher criminal frequency than the group of subjects without psychiatric disorder. Statistically significant differences were also observed on the basis of sex, with a higher level of offences among men than women (Table 3). Significant differences were not encountered in the number of offences committed on the basis of age or ethnic/racial origin (Table 3).

The criminal typology of the totality of the groups is shown in Fig. 1. Overall, crime is generally nonviolent, with burglary predominating (47.3%). The percentage of more serious offenses against persons (sexual offenses, murder) was very low (0.6%). Criminal typology on the grounds of psychiatric diagnosis is shown in Fig. 2 and Table 3. Statistically significant differences can be seen between the two groups studied in the offenses of burglary, robbery, offenses against police authority and nonfatal offenses against persons. It is particularly interesting to note that 58% of the subjects with heroin abuse/dependence were detained on some

occasion for burglary, compared to 15% of the subjects in the other group (Fig. 2). The percentage of arrestees/interviewees for robbery was also considerably higher among the group with heroin abuse/dependence than among subjects with no psychiatric disorder (Fig. 2). For the other two offenses, the inverse phenomenon occurred with statistically significant differences (Fig. 2, Table 3). The average number of offenses of burglary type per person was seven times higher and robbery four times higher in subjects with heroin abuse/dependence than in the group of subjects with no psychiatric disorder (Table 3). The average number of nonfatal offenses against persons per detainee was five times higher and offenses against authority four times higher among the group of subjects with no psychiatric disorder than among subjects with heroin abuse/dependence (Table 3).

A multi-factor analysis of the variance to study the influence of the demographic factors and of the psychiatric disorders and their possible interactions for each of the offenses showed that the psychiatric diagnosis was the most decisive variable in most of the offenses (Table 3).

Discussion

The general prevalence of mental disorders among criminal subjects has shown wide variations in the different populations studied. In the same way, the frequency of each of the mental disorders in these populations has also proved to be variable in the different studies (1–4,22,23). The frequency of abuse/dependence on illegal drugs was shown to be over 50% in several of the studies on psychiatric disorders among criminal offenders (1,3), while in other studies the frequency was below 12% (22–24). In the sample given here, there is a significantly high frequency (50.5%) of heroin abuse/dependence disorder (heroin on its own or associated with other drugs) among the subjects interviewed. In the same geographic area, the prevalence of heroin abuse/dependence among the general population has been reported to be 0.1 to 0.3% during the collection period (May to November, 1994) (25,26). Thus, the finding shows a possible association between criminal behavior and drug use, especially heroin (12,13). The predominance of the use of heroin and other opiates was also seen in studies of drug misusers in police custody (16) and in prison (2,24). However, a

TABLE 3—Analysis of criminal typology according to demographic and psychiatric variables.

	Total Offenses	Burglary	Drug Distribution	Robbery	Theft	Against Police	Against Persons
Sex	*	***	**	n.s.	**	n.s.	n.s.
Male	1.62	0.91	0.14	0.17	0.10	0.07	0.06
Female	1.15	0.15	0.26	0.23	0.23	0.05	0.08
Age (years)	n.s.	*	***	*	n.s.	n.s.	n.s.
16–20	1.84	1.10	0.0	0.34	0.13	0.02	0.05
21–30	1.59	0.84	0.15	0.17	0.12	0.07	0.06
>30	1.28	0.46	0.25	0.10	0.09	0.08	0.08
National/Ethnic Identity	n.s.	n.s.	***	***	n.s.	n.s.	n.s.
Spanish Caucasian	1.50	0.85	0.10	0.12	0.11	0.06	0.05
Spanish Gypsy	2.07	1.02	0.16	0.56	0.15	0.03	0.08
Non-Spanish nationals	1.29	0.21	0.46	0.10	0.15	0.10	0.12
Psychiatric Diagnosis	***	***	n.s.	*	n.s.	**	***
Heroin abuse	1.75	1.07	0.14	0.24	0.12	0.04	0.03
No psychiatric disease	1.07	0.15	0.19	0.06	0.11	0.12	0.15

The statistically significant values of the multi-factorial analysis are presented for the total number of offenses and for each type of offense in relation to demographic or psychiatric variables. Only offenses with a frequency over 5% are included. n.s. = no significant influence of the factor. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.0001$. The values represent the average number of offenses per subject in each of the groups studied. The analysis was carried out on the 416 subjects included in either the heroin abuse/dependence group or the group with no psychiatric pathology.

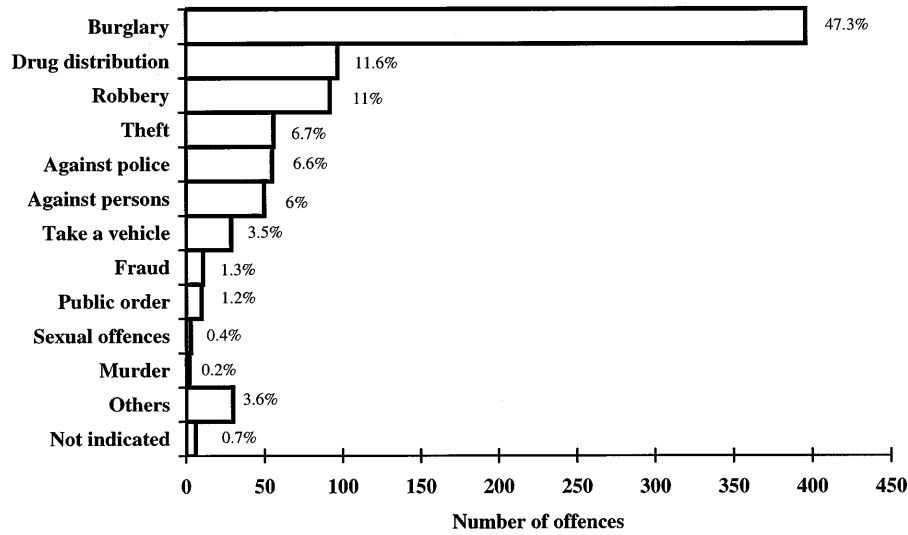


FIG. 1—Distribution of the different categories of offenses. The relative frequency of each offense is shown as a percentage of the total number of offenses (total number = 837). “Offenses against police” represents aggression/resistance offenses to police authorities. “Offenses against persons” represents nonfatal offenses against the person.”

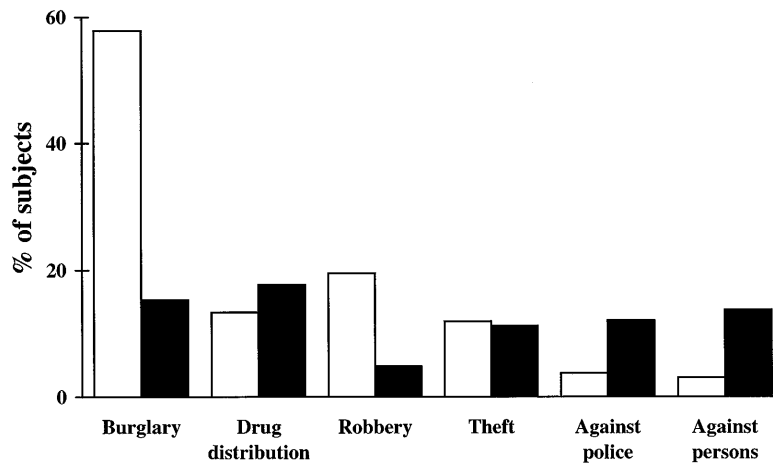


FIG. 2—Distribution of the percentages of subjects classified according to the diagnostic category (heroin abuse/dependence in white columns and no psychiatric disorder in black columns) and the type of offense. The percentage of subjects was calculated in relation to the total number of subjects in their own group (292 subjects in heroin abuse/dependence group and 124 subjects in the group without psychiatric disorder). Given that each subject could have committed different types of offense, the total of the percentages in each diagnostic group exceeds 100%. Only offenses with a frequency over 5% are shown.

direct cause-effect relationship between heroin abuse/dependence and criminal activity cannot be drawn from the present data due to the methodological characteristics (retrospective analysis of subjects with criminal activity) of the study.

The results of this study show that the demographic characteristics of heroin abusers were in some aspects different to those of other criminal offenders. The group of heroin addicts was younger than the control group (26 compared to 29 years) (Table 1). The phenomenon of criminality among the general population and even more among heroin addicts, is associated with juveniles and young adults (16,27). The reasons for this phenomenon would appear to lie in various factors: (a) higher mortality among substance abusers because of the prevalence of AIDS in their environment; (b) possible evolution with age to other types of criminal activity less susceptible to police control (for example, drug distribution); and (c)

the process of “maturing” among habitual substance-using criminal offenders by which an individual’s control of addiction is related to the achievement of an adequate level of maturity and personal stability, which is more likely to occur with increasing age (5,9,28). This last factor is supported by studies which show a reduction in criminal activity in successive periods of addiction (9). The finding of a certain protection against recidivism among subjects of over 30 years (Table 2) would seem to confirm this hypothesis.

In this study a high prevalence of heroin abuse/dependence was observed among criminal subjects of gypsy origin (82% compared to 40.7% in criminal subjects of Caucasian origin). These data suggest a greater presence of heroin addiction among socially marginal population groups (5).

Quantification of the parameters measuring habitualness in

criminal activity showed that the fact of being a heroin addict was, among the other factors studied, the main factor associated with this criminal habitualness. The average number of examinations per detainee during the study period made it clear that this parameter was mainly influenced by heroin addiction and to a lesser degree by sex (Table 3). In fact, the average number of examinations among subjects with heroin abuse/dependence was 1.75, while the group of subjects with no psychiatric pathology was 1.07. The recidivism variable showed similar findings (Table 2). The main factor of risk associated with recidivism was heroin abuse/dependence (O.R. = 10.15), followed by the factor of maleness (O.R. = 3.09). The average number of examinations per person during the study period and the higher level of recidivism among the heroin-addict group suggest that the consumption of illegal drugs (principally heroin in this case) should be considered as an essential factor in the maintenance of criminal conduct. The high level of recidivism among populations of drug abusers in police custody has been indicated previously (16). Using confidential surveys among heroin addicts a high level of habitualness in criminal activity has also been described previously (8,9,12,13).

One point worth highlighting in this study is the statistically significant differences found between the group of heroin addicts and the group with no psychiatric pathology in terms of the type of offense committed. Offenses against property (burglary, robbery) appear clearly associated with heroin abuse/dependence. On the other hand, offenses of a noneconomic nature (nonfatal offenses against persons, offenses against police authorities) are more frequent among the group with no psychiatric pathology than among heroin addicts. Previous studies which have analyzed the criminal typology of drug-addicted criminal offenders have shown a high proportion of offenses against property (between 50% and 66%) (12,14,16,19). In our study this percentage was somewhat higher (82% of the total number of offenses committed by the group). Among subjects with heroin abuse/dependence a predominance of one particular offense against property—burglary—was observed (Fig. 2), with a frequency of 61% of the total number of offenses committed by this particular group. The high presence of this offense when the group of heroin addicts is compared to the group of arrestees with no psychiatric pathology is one of the main findings of this study (Fig. 2 and Table 3). There was also a higher incidence of robbery among heroin addicts. However, for this offense the differences compared with the group of subjects with no psychiatric pathology were less (Fig. 2 and Table 3). The important association between certain offenses against property, such as burglary, and heroin abuse/dependence has already been pointed out elsewhere (27). In contrast, the frequency of offenses against the person among heroin abusers was low (19) and, unlike other studies (29,30), none of the heroin addicts were arrested for murder. In overall terms, these findings on criminal typology suggest that, at least in part, criminal activity of heroin addicts results from a need to finance their habit and that, once heroin dependence is established, it will condition the rate of criminal activity and the type of offense committed. However, due to the complex interaction of other variables such as sex, age and racial/ethnic origin (Table 3), it may not be affirmed that this is a single and direct relationship of cause and effect.

The influence of other variables on some types of offense is notable. The multi-factorial analysis showed that robbery and drug distribution offenses are closely associated with ethnic factors (Table 3). Analysis of the gender factor also seemed to suggest an association of women with offenses against property of a less destructive nature (Table 3).

In conclusion, the findings on criminality presented here confirm, by means of the use of a control group, traditional hypotheses which defend a relationship between criminal activity and heroin abuse/dependence (31). The results also make it possible to confirm that this relationship may not be generalized to all types of offenses and that there exist other factors with a marked influence on criminal conduct.

Acknowledgments

The authors wish to thank the medical staff members of the Clinic of Forensic Medicine, Bilbao, Spain for their collaboration in data collection.

References

- Chiles JA, Von Cleve E, Jemelca RP, Trupin EW. Substance abuse and psychiatric disorders in prison inmates. *Hosp Commun Psychiatry*, 1990;41:1132–4.
- Herrman H, McGorry P, Mills J, Singh B. Hidden severe psychiatric morbidity in sentenced prisoners: an Australian study. *Am J Psychiatry* 1992;148:236–9.
- Bland RC, Newman SC, Dyck RJ, Orn H. Prevalence of psychiatric disorders and suicide attempts in a prison population. *Can J Psychiatry* 1990;35:407–13.
- Daniel AE, Robins AJ, Reid JC, Wilfley DE. Lifetime and six-month prevalence of psychiatric disorders among sentenced female offenders. *Bull Am Acad Psychiatry Law* 1988;16:333–42.
- Alcades P, Vlahov D, Anthony JC. Characteristics of intravenous drug users by history of arrest and treatment for drug use. *J Nerv Ment Dis* 1992;180:48–54.
- Austland M, Batey R. Criminality of heroin users presenting to an Australian hospital-based drug and alcohol unit. *Br J Addict* 1990;85:795–801.
- Hammersley R, Morrison V. Effects of polydrug use on the criminal activities of heroin-users. *Br J Addict* 1987;82:899–906.
- Nurco DN, Shaffer JW, Ball JC, Kinlock TW, Langrod J. A comparison by ethnic group and city of the criminal activities of narcotic addicts. *J Nerv Ment Dis* 1986;174:112–6.
- Hanlon TE, Nurco DN, Kinlock TW, Duszynski KR. Trends in criminal activity and drug use over an addiction career. *Am J Drug Alcohol Abuse* 1990;16:223–38.
- Anglin MD, Hser Y. Addicted women and crime. *Criminology* 1987;25:359–97.
- Bell J, Hall W, Byth K. Changes in criminal activity after entering methadone maintenance. *Br J Addict* 1992;87:251–8.
- Hammersley R, Forsyth A, Morrison V, Davies J. The relationship between crime and opioid use. *Br J Addict* 1989;84:1029–43.
- Hammersley R, Alasdair F, Lavelle T. The criminality of new drug users in Glasgow. *Br J Addict* 1990;85:1583–94.
- Bean PT, Wilkinson CK. Drug taking, crime and the illicit supply system. *Br J Addict* 1988;83:533–9.
- Hinojal J. Estrés, agresividad y criminalidad. *Rev Esp Med Legal* 1988;54:53–66.
- Payne-James JJ, Dean PJ, Keys DW. Drug misusers in police custody: a prospective survey. *J R Soc Med* 1994;87:13–4.
- Spunt BJ, Goldstein P, Bellucci PA, Miller T. Race/ethnicity and gender differences in the drugs-violence relationship. *J Psychoact Drugs* 1990;22:293–303.
- Van Hoeven KH, Stonebumer RL, Rooney WC. Drug use among New York City prisons inmates: a demographic study with temporal trends. *Int J Addict* 1991;26:1089–105.
- Risser D, Bönsch A, Schneider B. Does drug abuse lead to criminal behavior? An analysis based on criminal registers of 117 drug-related deaths, examined in 1992 at the Institute of Forensic Medicine in Vienna, Austria. *J Forensic Sci* 1995;40:378–81.
- American Psychiatry Association. *Diagnostic and statistical manual of mental disorders*, 3rd rev. ed. Washington DC: American Psychiatry Association, 1987.
- Wolfgang ME, Figlio RM / Sellin T. *Delinquency in a birth cohort*. Chicago: University of Chicago Press, 1972.
- Gunn J, Maden A, Swinton M. Treatment needs of prisoners with psychiatric disorders. *Br Med J* 1991;303:338–41.
- Joukamaa M. Psychiatric morbidity among Finnish prisoners with

- special reference to socio-demographic factors: results of the Health Survey of Finnish Prisoners (Wattu Project). *Forensic Sci Int* 1995; 73:85–91.
24. Maden A, Swinton M, Gunn J. Drug dependence in prisoners. *Br Med J* 1991;302:880.
 25. Plan Nacional sobre Drogas. Memoria 1995. Madrid, Spain: Secretaría General Técnica del Ministerio del Interior, 1995.
 26. Plan Trienal de Drogodependencias. Gobierno Vasco. Vitoria-Gasteiz, Spain: Departamento de Justicia, Economía, Trabajo y Seguridad Social, 1996.
 27. Mott J. Opioid use and burglary. *Br J Addict* 1986;81:671–7.
 28. Winick C. Maturing out of narcotic addiction. *Bull Narc* 1962;14: 1–7.
 29. Lindquist P. Homicides committed by abusers of alcohol and illicit drugs. *Br J Addict* 1991;86:321–6.
 30. Leong GB, Silva JA. Psychiatric-legal analysis of criminal defendants charged with murder: a sample without major mental disorder. *J Forensic Sci* 1995;40:858–61.
 31. Nurco DN. Drug addiction and crime: a complicated issue. *Br J Addict* 1987;82:7–9.

Additional information and reprint request:
 J. Javier Meana, M.D., Ph.D.
 Department of Pharmacology
 University of the Basque Country
 E-48940 Leioa, Bizkaia, Spain