ORIGINAL ARTICLE

Changes in emergency consultations related to cocaine abuse during the period 2002 through to 2008

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None

Objective: To analyze the epidemiologic, clinical, and toxicologic characteristics of emergency consultations related to cocaine abuse.
Patients and methods: The 6-year study included patients seen in the emergency department (ED) for cocaine use in the hours prior to consultation. Epidemiologic, clinical, and toxicologic data were recorded.
Results: A total of 1755 patients were identified (292 patients per year, 70% male, mean age 31 years). Emergency consultations for cocaine abuse accounted for 0.76% of all medical emergencies, 15.3% of all toxic exposures, and 28.6% of all emergency consultations for substance abuse; these figures remained relatively stable over the 6-year study period. The drug was most commonly taken nasally (75%), for recreational use (91%), and usually in association with other substances (72%), particularly alcohol, cannabis, and amphetamine derivatives. The main reasons for consultation were anxiety (27%), agitation (20%), and palpitations (12%). The triage classification was level I in 3.6% of cases, and these patients were attended immediately in the ED resuscitation area. Hospital admission was required in 11% of cases, of which 45% were admitted to medical-surgical specialties, 44% to psychiatry, and 11% to intensive care. There has been no increase in the need for admission over the study period. Overall mortality was 0.17%.
Conclusions: Cocaine abuse, alone or combined with other substance abuse, generates a large number of consultations to ED. The main symptoms are neuropsychiatric and cardiovascular. There have been no significant changes in incidence or in the need for admission over the past 6 years. [Emergencias 2008;20:385-390]

Key words: Cocaine. Substance abuse. Overdose. Emergency department.

Introduction

The consumption of cocaine has progressively risen in Spain in the last decade and has gone from being a drug which 3.4% of the Spanish population between 15 and 64 years of age recognised having consumed at some time in the survey of the National Plan on Drugs in 1995, to 7% in the survey carried out in 2005[1]. It is therefore not surprising that care related to medical problems derived from its consumption has increased in the healthcare system in general and particularly in the emergency departments. At present, cocaine occupies the first place as the reason for consultation in hospital emergency departments (HED) in relation to the consumption of illegal drugs not only in Spain[2] but also in many other countries[3] and currently represents 10% of the toxicologic emergencies[4]. Cocaine is usually consumed with other drugs of abuse particularly ethylic alcohol and amphetamines thereby augmenting its toxicity, masking its manifestations and complicating the treatment. The aim of this study was to analyse the emergencies attended in a tertiary care urban hospital in the last 6 years in relation to the consumption of cocaine and particularly its epidemiologic and clinical characteristics and outcome.

Methods

A descriptive retrospective study was carried out in the Emergency Department of the Hospital Clinic of Barcelona which is a tertiary care, high technology, university hospital during the period

from January 1, 2002 to December 31, 2007. The total number of emergencies per year, toxicologic emergencies, emergencies for drugs of abuse and as the reason for consultation related to cocaine consumption in the previous hours were reported. Toxicologic emergencies were considered as all the consultations made to the HED related to exposure to a toxic product including medications, ethylic alcohol, other drugs of abuse, agricultural, domestic or industrial products, plants and mushrooms and venomous animals. These patients are mainly attended in the medical emergencies department together with other diseases which could be denominated medical (chest pain, stroke, cardiac insufficiency, fever,…) and which is differentiated from other areas of the emergencies (surgery, traumatology, otorhinolaryngology, ophthalmology, psychiatry, obstetrics and gynaecology). The data collection was possible because the emergency department has a section on clinical toxicology which routinely collects the toxicologic emergencies and extracts a series of pre-established data from the clinical histories. Patients who consulted in the HED for an abstinence syndrome or who wished to initiate a detoxication programme were excluded from the present study.

The epidemiological (day and time of consultation, sex, age, area of care), toxicologic (substances of abuse involved) and the final outcome data (discharge or admission) were registered. In cases requiring admission, it was specified whether this was made in a conventional medical-surgical, psychiatric or intensive care unit. In addition, the first 30 clinical histories of each year were reviewed to collect the reason for consultation, the symptomatology and the treatment administered in each case. The toxicologic analysis, when it was performed, included the quantitative determination of blood ethanol and the qualitative urinary values of cocaine, benzodiazepines, amphetamines, opiates methadone, cannabis and occasionally, also lysergic acid diethylamide (LSD), liquid ecstasy (GHB) and ketamine. The detection of cocaine was performed using a qualitative enzymoimmunoassay of benzoilecgonine with DADE reagent (Behring®). In the cases in which toxicologic analyses were not available, the data taken from the clinical history provided by the patient and/or accompanying person(s) were considered as correct.

The incidence of emergency consultations for cocaine were calculated in relation to the total visits to the emergency departments and to the total number of visits of toxicologic cause and those derived from the consumption of substances of abuse. The evolution of the need for hospital admission as well as the different hospital areas in which the patient was referred over the 6 years of the study were also calculated. The quantitative variables are expressed as means and standard deviation and the qualitative values as percentages. The homogeneity of the distributions has been contrasted using the chi-square test. The temporal evolution was analysed using linear regression with statistical significance being considered at a p value < 0.05.

Results

A total of 1,755 emergencies due to cocaine consumption were registered with the following annual distribution: 219 cases in 2002, 237 in 2003, 298 in 2004, 424 in 2005, 334 in 2006 and 243 in 2007. The epidemiologic and clinical characteristics of these patients are shown in Table 1 with the predominance of the male sex, a greater incidence of consultations due to cocaine in July and August, on the weekends and during the night shift, with the use of the drugs for predominantly recreational purposes and via nasal being of note. Twenty cases of drug entry via the digestive tract, 18 of which corresponded to cocaine trafficking (body packers) and 2 cases for precipitated occultation of the drug for arrest by the police (body-stuffers) are also worthy of mention. In 485 cases (27.6%), cocaine was the only substance consumed, while in the remaining 1,370 cases (72.4%) the concomitant use of other substances was reported, including ethylic alcohol. The reasons for consultation were predominantly neuropsychiatric or cardiovascular. In total 62 of the 1,755 patients (3.6%) received triage category 1 and were immediately attended in the cardiopulmonary emergency reanimation area. In the patients receiving treatment (39%), benzodiazepines were the most commonly used drugs.

During this same study period a total of 229,325 visits were registered to the medical emergency area (35,178; 38,451; 41,072; 38,913; 38,429 and 37,282 for each year, respectively), 11,672 of which were toxicologic emergencies (1,830; 1,763; 1,940; 1,734; 2,182 and 2,183 for each year, respectively) and 6,362 were caused by drugs of abuse (1,014; 948; 1,036; 831; 1,340 and 1,193 for each year, respectively). Thus, the global incidence of emergencies due to cocaine in our centre was of 0.76% of the medical patients visited, 15.3% of the toxicologic emergencies and

Table 1. Epidemiologic, clinical and toxicologic characteristics of the patients

Variable	Value
Age (mean±SD, in years)	31.6 ± 8.7
Sex ([n(%)]*	
– Female	525 (29.9%)
– Male	1.230 (70.1%)
Month of the year [n(%)]*	
– January	108 (6.2%)
– February	111 (6.3%)
– March	162 (9.2%)
– April	162 (9.2%)
– May	115 (6.6%)
– June	163 (9.2%)
– July	172 (9.8%)
– August	176 (10.1%)
– September	151 (8.6%)
– October	146 (8.3%)
– November	134 (7.6%)
– December	155 (8.8%)
Day of the week [n(%)]*	
– Monday	222 (12.6%)
– Tuesday	129 (7.4%)
– Wednesday	166 (9.4%)
– Thursday	203 (11.6%)
– Friday	204 (11.6%)
– Saturday	425 (24.2%)
– Sunday	406 (23.2%)
Time of day [n(%)]*	
– From 0:00 h to 7:59 h	628 (35.8%)
– From 8:00 h to 15:59 h	581 (33.1%)
– From 16:00 h to 23:59 h	546 (31.1%)
Via of cocaine consumption [n(%)]*	
– Nasal	1.297 (75.0%)
– Mixed	369 (21.3%)
– Intravenous	28 (1.6%)
– Digestive	20 (1.1%)
– Pulmonary	17 (1.0%)
– Not determined	24
Intentionality [n(%)]	
– Recreational	1.305 (91.2%)
– Suicide	108 (7.6%)
– Accidental	18 (0.2%)
– Not determined	324
Other substances consumed [n(%)] (n = 1370)	
– Alcohol	1.172 (85.5%)
– Benzodiazepines	362 (26.4%)
– Cannabis	360 (26.3%)
– Amphetamine derived	228 (16.6%)
– Heroine	179 (13.1%)
– GHB	140 (10.2%)
– Methadone	88 (6.4%)
– Ketamine	38 (2.8%)
– Different drugs	94 (6.8%)
Reason for consultation [n(%)] (n=180)*	
– Psychiatric	100 (65.5%)
Anxiety	48 (26.6%)
Agitation	36 (20%)
Delirium	9 (5%)
Hallucinations	5 (2.7%)
Insomnia	2 (1.1%)
– Cardiovascular	45 (25%)
Palpitations	22 (12.2%)
Chest pain	21 (11.6%)
Dyspnoea	2 (1.1%)
– Neurological	26 (14.4%)
Diminishment of consciousness	14 (7.7%)
Abnormal movements	6 (3.3%)
Convulsions	3 (1.6%)
Paresthesia	3 (1.6%)
– Worried about consumption [n(%)]	22 (12.2%)
– Attempted suicide [n(%)]	15 (8.3%)
Treatment [n(%)] (n=180)**	
– None	110 (61.1%)
– Benzodiazepines	67 (37.2%)
– Neuroleptics	16 (8.8%)
– Activated charcoal	4 (2.2%)
– Antiepileptics	2 (1.1%)
– Others	9 (5%)

*p < 0.001
**Corresponding to the first 30 cases of each year. The total sum is greater than 180 because some patients reported more than one reason for consultation and received more than one treatment.

28.6% of the emergencies generated by all the abuse substances (including ethanol). In the first case, the incidence showed an ascending, albeit not statistically significant, trend while the incidence in the remaining cases remained practically constant (Figure 1).

A total of 191 patients required admission (17, 31, 28, 26, 59 and 30 for each year, respectively) representing 10.9% of the patients attended in the HED for cocaine consumption. The admissions were made in conventional psychiatric hospitalisation wards in 85 cases (44.5%), conventional medical-surgical wards in 84 cases (44.0%) and in intensive care units in 22 cases (11.5%). The evolution of the global need for admission showed an ascending, albeit not statistically significant, trend during these years especially due to a greater number of admissions in medical-surgical wards (Figure 2). One patient died during the stay in the emergency department and another two patients died during hospital admission (mortality 0.17%).

Discussion

The present study confirms the relevance which cocaine consumption has acquired as the reason for consultation in a HED and the current leadership of illegal substance abuse among the toxicologic emergencies similar to what other authors have described[5]. However, ethylic intoxications continue to be the main cause of overdose in Spain[6,7]. An ascending trend was also observed in the percentage of emergencies due to cocaine in relation to the total number of medical emergencies attended, although the short time period analysed (2002-2007) probably did not allow this trend to achieve statistical significance. However, the participation of cocaine as a cause of toxicologic emergencies or by drugs of abuse has remained stable thereby confirming the social role that this drug has acquired in Spain in the last decade, even despite the continued appearance of new illegal substances such as ecstasy (MDMA), liquid ecstasy (GHB), poppers or ketamine[8-11].

A cocaine overdose may be mortal or induce severe organic, predominantly cardiovascular[12], neurological[13] or renal[14] disorders which justify admission in an intensive care unit or a conventional hospitalisation ward[15] after the first healthcare assistance has been provided. The most frequent consultations in the present study were for neuropsychiatric and cardiovascular manifestations with no statistically significant differences being

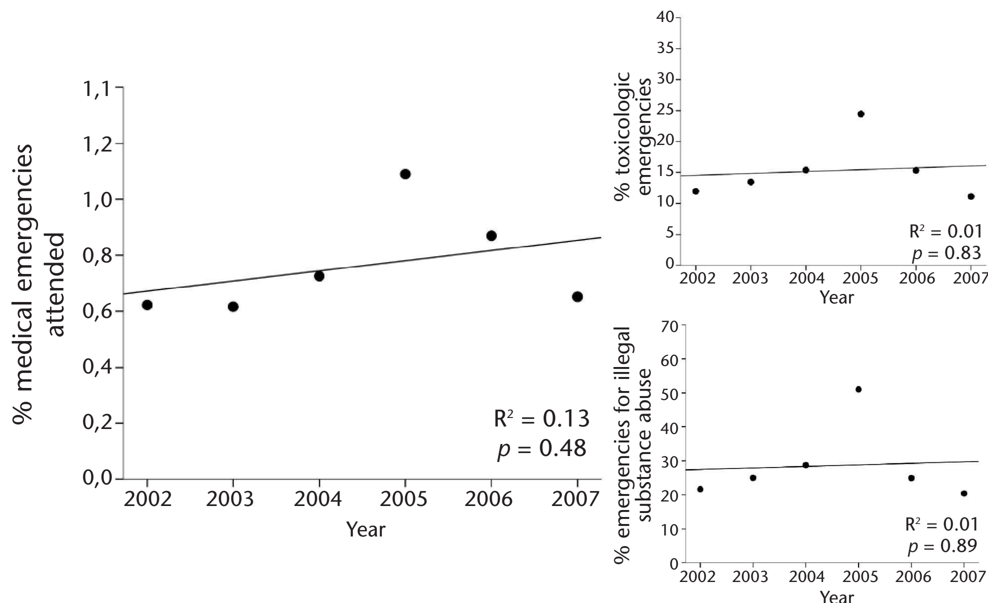

Figure 1. Evolution of the incidence of cocaine intoxications in relation to the total emergency department visits (left) and the toxicologic visits and those generated by illegal substance abuse (right).

observed over the study period in regard to the needs for admission of patients who consulted to the emergency department for symptoms derived from cocaine consumption. However, as previously suggested, the study period was not prolonged and should be followed controlling the outcome to determine whether the trends insinuated (greater need for admission in medical-surgical and psychiatric wards) are confirmed in the next years. On the other hand, the emergency observation units (28 beds in our HED), which have an increasingly higher number of better qualified and healthcare personnel and monitoring and treatment technology resources, have become a usual place to place a case of overdose under 24-48-hour observation and treatment or until resolution of the clinical picture. Thus, in the HED which do not have these units, the percentage of admissions is probably higher.

The clinical and demographic characteristics of the patients attended in the emergency department due to cocaine consumption showed a greater number of cases of males, coinciding with the data published by the National Plan on Drugs regarding the profile of consumers. On the other hand, the greater casuistic incidence in the summer months during the weekends and during the night-time confirm the recreational use of this drug[16,17].

Emergencies due to cocaine are occasionally not within the context of drug consumption but rather for trafficking: as in the body-packers or body-stuffers, which is a relatively frequent situation in large metropolises and in which patients undergo a great risk whether of intestinal obstruction by the drug packets located in the intestinal lumen or overdose because of rupture of any of the packets[18-20]. The consumption of cocaine within a depressive setting of the patient has also been detected, normally in association with over ingestion of medications with attempted suicide or parasuicide. The risk of suicide in psychotic patients is higher if they are consumers of cocaine or amphetamines[21].

In a very high number of cases (72.4%), cocaine was used with other abuse drugs which modify the clinical characteristics of a cocaine overdose and make therapeutic management difficult. This polyconsumption is very often seen in drug addicts and it is one of the factors which may induce sudden death[22,23]. Use via nasal is the most usual in cocaine addicts and is generating a new nasal disease normally associated with vascular changes in the mucosa or in necrosis of the nasal septum and is also occasionally a reason for consultation in the emergency department[24].

The mortality in the present series was relatively low (0.17%) although the need for admissions in the reanimation area of the emergency department (3.6%) and posterior admission in the intensive care unit (1.2%) shows the potential severity. On the other hand, it should not be forgotten that cocaine consumption is a recognised cause of sudden death and that in many of these patients the extrahospital emergency services do not arrive in time to initiate effective reanimation manoeuvres and thus the real mortality associated with

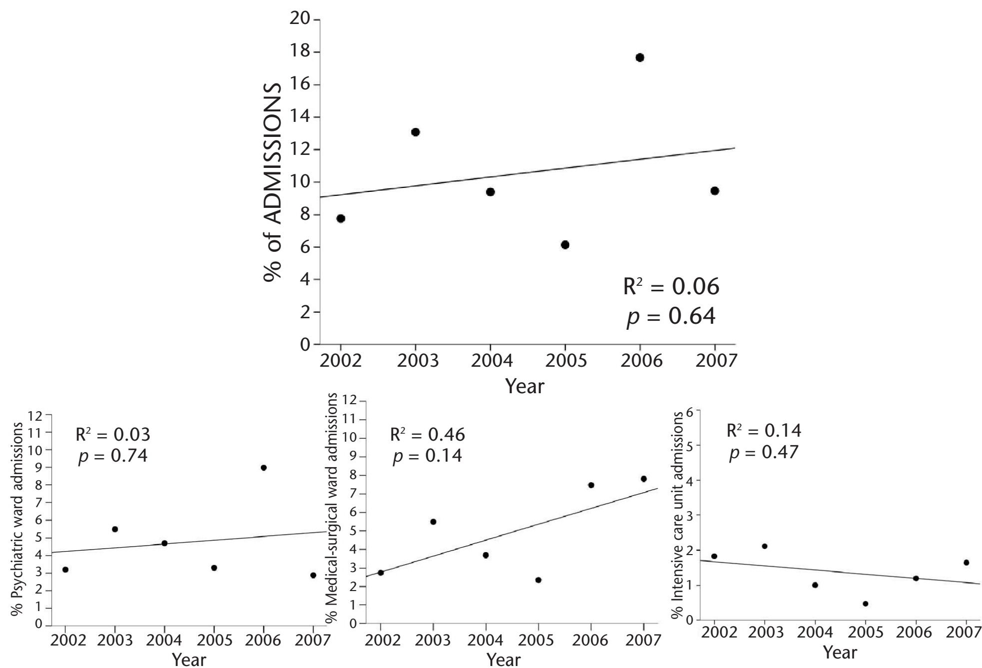

Figure 2. Evolution of the need for admission in emergencies due to cocaine consumption (upper graph) and broken down by the different hospitalisation wards receiving the admission (lower graphs).

cocaine consumption is probably higher than that reported in this study[25].

One limitation of this study is that it was performed in only one emergency department of a hospital situated in the centre of a large city with a reference area including a large number of clubs which may have magnified the incidence. On the other hand, despite weekly protocols, the review of the clinical histories was retrospective and, thus, some data in determined patients may be absent. In addition, the presence of cocaine was not analytically verified in all the cases. However, previous studies in our own hospital have shown that when the physician working in the emergency department suspects the consumption of drug of abuse as being the cause of the signs and symptoms of the patient, this suspicion was correct in 82% of the cases[26]. Finally, as we have already mentioned, the limited study period (6 years) may have conditioned the presence of a beta statistical error which did not allow statistical significance to be demonstrated in the trends in outcome observed. Nonetheless, the consumption of cocaine, alone or in combination with other substances of abuse, produces a notable number of consultations to the emergency departments and carries an important associated morbidity and the frequent need for hospital admission, although this need has remained stable over the last years.

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Evolución de las consultas urgentes relacionadas con el consumo de cocaína durante el periodo 2002-2007

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Objetivos: Analizar la evolución temporal de las características epidemiológicas, clínicas y toxicológicas de las consultas urgentes relacionadas con el consumo de cocaína.
Método: Pacientes que consultaron al servicio de urgencias durante un período de 6 años por síntomas relacionados con el consumo de cocaína en las horas previas. Se recogieron datos epidemiológicos, clínicos y toxicológicos.
Resultados: Se identificaron 1.755 pacientes (292 pacientes/año, 70% varones, edad media 31 años). Las urgencias por cocaína supusieron el 0,76% del total de urgencias médicas, el 15,3% de las urgencias toxicológicas y el 28,6% de las urgencias generadas por sustancias de abuso, porcentajes que se han mantenido relativamente estables a lo largo de los 6 años. La forma de consumo más habitual fue por vía nasal (75%), con intención recreativa (91%) y asociada a otras sustancias de abuso (72%), especialmente alcohol, cannabis y derivados anfetamínicos. Los principales motivos de consulta fueron la ansiedad (27%), la agitación (20%) y las palpitaciones (12%). El 3,6% de las consultas urgentes recibieron la categoría 1 de *triaje* y fueron asistidas en el área de reanimación de urgencias. El 11% requirió ingreso hospitalario: un 45% en áreas médico-quirúrgicas, un 44% en psiquiatría y un 11% en cuidados intensivos. No se ha observado un incremento de las necesidades de ingreso durante el periodo estudiado. La mortalidad global de la serie fue del 0,17%.
Conclusiones: El consumo de cocaína, sola o combinada con otras sustancias de abuso, genera un elevado número de consultas al servicio de urgencias, con predominio de manifestaciones neuropsiquiátricas y cardiovasculares, aunque no se objetivan cambios significativos en los últimos 6 años respecto a la incidencia ni a las necesidades de ingreso. [Emergencias 2008;20:385-390]

Palabras clave: Cocaína. Sustancias de abuso. Sobredosis. Urgencias.