

Cocaine-related admissions to an intensive care unit: a five year study of incidence and outcomes.

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Summary

Cocaine misuse is increasing and it is evidently considered a relatively safe drug of abuse in Ireland. To address this perception, we reviewed the database of an 18-bed Dublin intensive care unit, covering all admissions from 2003 to 2007. We identified cocaine-related cases, measuring hospital mortality and long-term survival in early 2009.

Cocaine-related admissions increased from around one annually in 2003-05, to 10 in 2007. Their median age was 25 years and 78% were male. The median Acute Physiology and Chronic Health Evaluation (APACHE) II score was 16 and median length of intensive care stay was 5 days. Ten patients died during their hospital stay. A further five had died by the time of follow-up, a median of 24 months later. One was untraceable.

Cocaine toxicity necessitating intensive care is increasingly common in Dublin. Hospital mortality in this series is 52%. These findings may help to inform public attitudes to cocaine.

There are obvious, inherent challenges in measuring recreational and illicit drug use in society [1]. Since self-reporting of these activities is rare, a reliance on indirect measurements inevitably ensues. These include criminal convictions, admissions for rehabilitation and the seizure of drugs by law enforcement agencies. Various sources of evidence suggest that cocaine use has become more widespread in Ireland in recent years. Official reports show that, under the misuse of drugs act, offences related to cocaine increased from 11 cases in 1990, to 297 in 2001, and over 1,200 in 2005. The number of seizures of cocaine increased from 157 in 1997 to 968 in 2005 [2, 3]. A recent analysis of banknotes in Ireland demonstrated detectable levels of the drug on 100% of euro notes examined [4].

One of these reports, while describing the growing use of cocaine in Ireland, concluded that it “is perceived as a safe drug that does not lead to dependency in the same way that other drugs such as heroin do” [2]. This is consistent with the authors finding that few users regard cocaine as their primary problem; even when seeking admission for rehabilitation, they are typically more concerned about the dangers of co-ingested drugs. While it is likely that such users are aware of the long-term consequences of its misuse, cocaine has immediate cardiac and extra-cardiac adverse effects which may be acutely life-threatening [5, 6]. It is of particular concern that in managing these effects there is no

reliable antidote: although severe hypertensive crises often arise, beta blockers are contraindicated, and control of agitation and temperature constitute the mainstay of therapy [7]. Furthermore, cocaine is usually mixed by dealers with other substances or drugs, depending on local availability. This complicates diagnosis, toxicity, and treatment [8-11]. It is not known what adulterants are used for this purpose by Irish drug traders.

Despite such compelling evidence of a major increase in cocaine use in Ireland over recent years, little has been written about severe overdoses. Notably, though, one recent article described a series of four out-of-hospital cardiac arrests attributable to the drug [12]. It is unclear how these acute episodes correlate with the underlying trend in long-term cocaine use, as the study only describes a two-year period. It is likely however that Intensive Care Unit (ICU) admission data will reflect significant trends in cocaine use in society. We therefore reviewed data on ICU admissions over a five-year period to evaluate patterns in acute cocaine toxicity. We also measured outcomes, including short and long-term survival, to inform the societal perception of cocaine as “a safe drug”.

Methods

Following local ethics committee approval, we analysed the prospectively recorded database of the 18-bed ICU in the Mater Misericordiae University Hospital, Dublin, an inner-city teaching hospital. During 2008 we reviewed all admission data covering the period from January 1st 2003 to the 31st of December 2007 to identify all instances of admission attributed to cocaine consumption. From this we recorded baseline demographic data including age, sex and Acute Physiology and Chronic Health Evaluation (APACHE) II score as a measure of the severity of their admitting illness. We also recorded whether they had taken other drugs noted in the admission records. From their ICU discharge documentation we recorded length of stay in ICU and survival status at that point. The hospital database provided information on hospital survival. In February 2009 we attempted to trace those patients discharged to ascertain their present survival status. We attempted to contact the patients themselves in the first instance, followed by their next-of-kin as identified on the hospital records, and finally their general practitioners.

Results

During the 5 years studied a total of 19 patients were admitted to the ICU with diagnoses of cocaine toxicity. All of the 19 patients were admitted through the emergency department of our hospital and were then transferred to the intensive care unit. The reasons for intensive care admission included resuscitation following cardiac arrest, and management of coma, seizures and pulmonary aspiration (see Table 1). All patients required tracheal intubation and mechanical ventilation. The annual rate of admission showed a strongly increasing pattern from about one case per year in the first three years to 10 cases in 2007 (see Figure 1). The patients had a median age of 25 years (range 17-47 years) and 78% of the group were male. Most of the patients were previously healthy: there was one asthmatic and one diabetic patient, both conditions being previously well controlled. The cohort included one body-packer, i.e. an individual who was transporting cocaine packages by internal concealment presumably to elude customs officials. This patient underwent an exploratory laparotomy to remove these packages, one of which had ruptured. The others had all taken the drug for personal use. None of the other patients required surgical intervention at any point during their intensive care stay. Their median APACHE II score of 16 (range 5-36), indicated significant physiological disorder. Their median length of stay in ICU was 5 days (range 1-16 days). Of the 19 admitted, nine died in the ICU and one more of the 10 discharged died subsequently on a hospital ward. Thus hospital mortality for the group was 52.6%.

Follow-up data was sought in early 2009, a median of 24 months (range 11-50 months) after admission. Of the nine patients who survived to hospital discharge, one, the body-packing patient, was untraceable. Regarding those on whom data were obtained, a further five of this eight had died in the intervening period. Thus only three of the original 19 patients were known to be alive at this time.

From their original admission data, nine of the group were known to have taken other substances, while ten were believed to have taken cocaine in isolation. Though the numbers are too small for detailed statistical analysis, it appears that hospital mortality was higher in those who had taken only cocaine, of whom six died in hospital (see table 2). The mortality in the group who had co-ingested sedative and hypnotic agents, in contrast, is low.

Discussion

Our data show a marked increase in ICU admissions for the management of cocaine poisoning over the period from 2003 – 2007. This is consistent with other measures of cocaine use in Ireland. The patients were typically male and young, and required relatively long ICU stays. They were severely unwell by APACHE II criteria. More than half of the patients died during their hospital admission. We were unable to gather follow-up data on one individual, a body-packer, who according to local police (Garda) records has left the country after serving a custodial sentence.

It is quite likely that many of the patients in this series are inclined to high-risk and criminal behaviour, in view of the mechanism of their initial presentations. The low survival rate at the time of follow-up is nonetheless striking amongst the nine patients who were discharged from hospital alive. That such low survival could be observed in a modern western economy in a group of patients with a median age of 25 is in itself a remarkable finding. Whether this can be attributed to ongoing cocaine use, or addiction, is outside the scope of this report. A further limitation of our study is that it is confined to a single centre, albeit a large urban one. It is also possible that other patients were admitted with undiagnosed cocaine toxicity over the period, perhaps as trauma victims or with acute coronary syndromes. We do not have any whole-hospital data on cocaine-related admission. It would of course be difficult to vouch for the quality of such data given the obvious reluctance of patients to admit to illicit drug ingestion.

The mortality rate we describe is high even for the level of illness at presentation.

Prediction models based on APACHE II scores indicate that the group would have a predicted mortality rate of around 25% (for scores of 15-19) [13]. While the numbers we have studied are small, these findings are nonetheless of concern. Previous researchers have suggested that in the overdose population, APACHE II criteria may be poorly reflective of severity of illness and mortality risk [14].

Our data on the effects of co-ingested drugs is consistent with the known neuro-protective effects of benzodiazepines and opioids. It also further validates the role of benzodiazepines in the treatment of cocaine toxicity. This may be useful in advising habitual cocaine users on safer strategies for its use if they are reluctant or unable to desist from it.

Our findings contrast markedly with data from other countries, which do not suggest that cocaine is particularly lethal in overdose compared with other drugs of abuse. A Spanish study of deaths attributable to opiate or cocaine abuse found that “opiates in the absence of cocaine were found 49 times more often among people dying from acute reactions ... than cocaine in the absence of opiates”. The authors furthermore suggested that “cocaine has not been a major contributing factor in deaths ... in Spain” despite the fact that “the prevalence of cocaine consumption (was) higher than that of heroin” [15]. A possible explanation for our contrasting findings is that the adulterants used to “cut” cocaine in Ireland are significantly more toxic than elsewhere.

While the underlying causes of our findings may remain unclear, it is apparent that severe cocaine toxicity is becoming more common in Ireland and that affected patients often die as a result. It appears to be more lethal than other drug overdoses treated in this ICU [16]

and also more lethal than cocaine overdoses described in other countries. Recent reports of major consignments of cocaine entering Ireland, in some cases measured in tonnes, are consistent with a body of evidence that cocaine use in the British Isles is now the highest in Europe, having recently exceeded that of Spain [17]. We suggest therefore that our findings should be urgently publicised to address perceptions of the drug's risk profile and of its adverse effects.

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Table 1. Patient characteristics and outcome data for cocaine-related intensive care admissions from 2003 -2007.

Case	Age	Length of stay (days)	Sex	Apache II score	Hospital outcome	Current status	Reason for intensive care admission
1	19	4	male	10	Survived	Dead	Cardiac arrest
2	44	10	male	22	Died	Dead	Cardiac arrest
3	24	8	female	27	Died	Dead	Cardiac arrest
4	28	2	female	13	Died	Dead	Cardiac arrest
5	17	16	male	16	Died	Dead	Comatose
6	29	5	male	12	Died	Dead	Comatose
7	21	5	male	5	Survived	Dead	Comatose
8	33	2	female	16	Survived	Alive	Aspiration injury
9	24	8	male	29	Survived	Dead	Comatose
10	18	1	female	27	Died	Dead	Comatose
11	25	2	male	9	Died	Dead	Aspiration injury
12	21	5	male	16	Survived	Dead	Comatose
13	27	3	male	26	Died	Dead	Comatose
14	21	9	male	36	Survived	Alive	Seizure
15	43	2	male	22	Died	Dead	Cardiac arrest
16	47	4	male	21	Died	Dead	Comatose
17	23	7	male	6	Survived	Dead	Cardiac arrest
18	36	9	male	28	Survived	Unknown	Seizure
19	41	13	male	5	Survived	Alive	Seizure

Figure 1. Cocaine-related admissions to intensive care from the period 2003 – 2007.

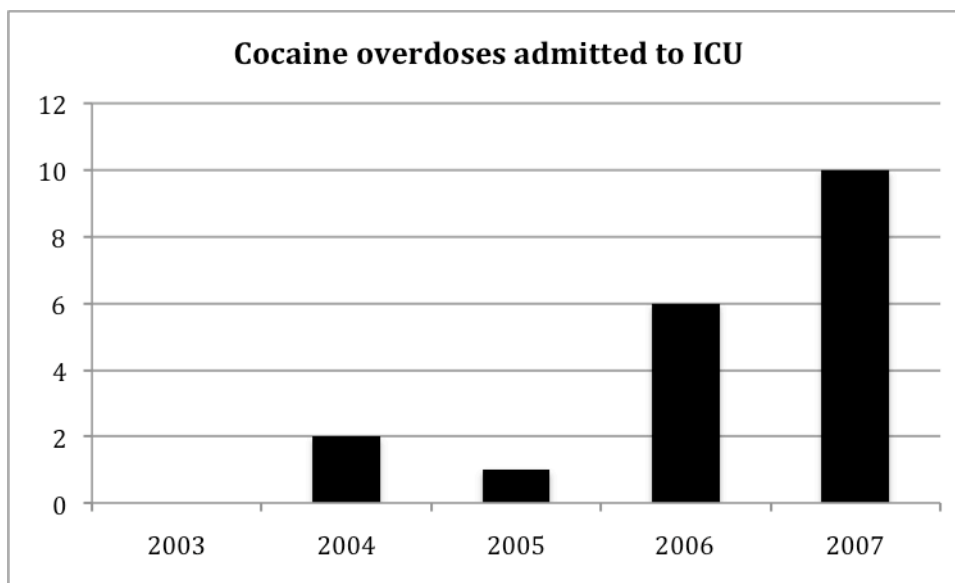


Table 2. Outcomes from the use of cocaine with or without other co-ingested drugs.

Drug	Number	Hospital mortality (%).
Cocaine only	10	60
Opioids	5	20
Benzodiazepines	6	16
Alcohol	4	25
Amphetamines	2	50
Phencyclidine	2	50