High mortality among young crack cocaine users in Brazil: a 5-year follow-up study.

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Abstract

Aims: Follow-up studies show that smokers, alcoholics and heroin addicts have high mortality rates, but there is little information on crack users. We have investigated the mortality rate among this population, including its risk factors and causes of death. **Design**: A five-year follow-up study. **Participants and Setting**: A cohort of 131 crack dependent patients, admitted to a public detoxification unit in Sao Paulo between 1992 and 1994. **Measurements**: Data collected from a structured personal interview and from a review of patients' hospital records, confirming the deaths from records held at the Municipal Offices. **Findings**: Of the 124 (94.6%) patients located 23 (18.5%) had died (a mortality ratio of 7.6). Homicide was the commonest cause of death (n=13). Observed mortality rate, adjusted for age and sex, was 24.92 per 1000, whilst the expected all-cause mortality rate in São Paulo, also adjusted for age and sex, was 3.28 per 1000, giving an excess mortality rate of 21.64 per 1000. Survival analysis showed that the probability of being alive 5 years post-treatment was 0.80 (95% CI = 0.77 to 0.84). Cox's proportional hazards regression showed 3 factors predicted mortality: history of intravenous drug use (hazard ratio 3.28, 95% CI 1.42 – 7.59), unemployment at index admission (hazard ratio 3.48, 95% CI 1.03 – 11.80) and premature discharge from index admission (hazard ratio 2.21, CI 0.94 – 5.18).

Conclusions: Community-based and tailored interventions should be considered to improve those patients' social support and permanence in treatment.

Keywords

Crack cocaine; mortality; drug abuse; addiction; follow-up study

People who misuse licit or illicit substances have higher mortality rates[1-5]. Most research has been done with other drugs and little is known about mortality in crack users. In the present study 131 consecutive crack dependent patients, admitted to the detoxification ward of a public hospital with a city-wide catchment area in São Paulo between 1992 and 1994, were followed-up 5 years later.

Participants, methods and results

The sample was predominantly young (mean age = 23.6 years, SD=6.7), male (88.5%) white (75%), single (67%), of low educational attainment (56%) and unemployed (69%) – see table 1. All met DSM-IV criteria for cocaine dependence. Sixty percent of the sample had been using crack for more than one year and 28.7% (n=35) had ever injected an illicit substance. Only 2 patients reported ever having used heroin. Just under 50% of patients had had previous episodes of treatment.

(TABLE 1 NEAR HERE)

Between 1998 and 1999, 124 (94.6%) of the original cohort were located (mean follow-up 44.3 months) and interviewed using a structured questionnaire. The project was approved by the local ethics committee. Death certificates were verified from records held at the Municipal Offices. Seven patients (5.4%) and their families could not be traced. Of the 124 patients for whom information was available, 23 (18.5%) had died: 3 were due to accidents (2 cocaine overdoses and

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1 drowning), 7 attributed to infectious complications of intravenous drug use (6 AIDS-related and 1 of hepatitis B) and 13 had died from gunshot injures. Relatives reported that these latter deaths were related to turf fights, punishment meted out by drug dealers for unpaid debts or police repression. Mean age at death was 27 years (range: 18 to 40). It is possible that some of the patients who died of non-HIV related causes were HIV positive but this information was not recorded on the death certificate.

Survival analysis showed that the probability of being alive 5 years post-treatment was 0.80 (95% CI = 0.77 to 0.84), see Figure 1. Observed mortality rate, calculated by the direct standardisation method, adjusted for age and sex, was 24.92 per 1000. The expected all cause mortality rate in São Paulo, adjusted for age and sex, was 3.28 per 1000 inhabitants, giving an excess mortality rate of 21.64 per 1000 – a mortality ratio of 7.60.

(FIGURE 1 NEAR HERE)

Seventeen variables were tested as predictors of mortality using Cox's proportional hazards regression. These included: demographic data, level of schooling, drug use variables, criminal history, treatment history and pre-admission psychosocial assessment. Three variables were identified as predictors of mortality: a history of intravenous drug use (hazard risk = 3.28, 95% CI = 1.42 to 7.59, $p = 0.005$), unemployment at index admission (hazard risk = 3.48, 95% CI = 1.03 to 11.80, $p =$

0.045) and premature discharge during index admission (hazard risk = 2.21, 95% CI = 0.94 to 5.18, p = 0.068).

Comment

This is one of the first studies of mortality in crack users. Follow-up studies of this population are rare and tend not to have mortality as their main focus[1], making comparisons with other data difficult. The nearest comparable group is opiate addicts for whom more data are available. These follow-up studies usually report death rates between 6 and 22 deaths per 1000[2-5]. In these countries overdose, AIDS, accidents and suicide are the principal causes of death among opiate addicts As opiate use is extremely rare in Brazil, corresponding mortality data are not available. In our study homicide was the main cause of death accounting for 56% of all deaths. The age adjusted homicide ratio for our sample was 7.74, suggesting that crack use substantially increases the risk of a violent death. In Hser et al's[5] study 19.5% of deaths were due to homicide, suicide or accidents. In the USA, which has similar gun laws to Brazil, it has been argued that violence surrounding emerging crack markets led to an increase in the homicide rate[6].

A limitation of our study is that patients came from just one hospital, albeit one that admitted patients from all parts of São Paulo City and one of just 2 hospitals with specialist detoxification units at the time the study began. This limits the generalisabity of the results.

The three predictors of death identified in the regression analysis (premature discharge from hospital, past intravenous drug use and unemployment) should be studied further in other cohort or case-control studies, as these factors could help inform future changes in treatment delivery. Elucidation of why some patients leave hospital prematurely is needed, so that we can develop services that better engage these high-risk individuals. Needle exchange schemes have become increasingly available in Brazil, but they were still illegal at the time of the study. This harm reduction intervention may already have had an impact on the incidence of new cases of HIV among intravenous drug users. Unemployment may be a proxy for other variables that are more directly related to the risk of death in cocaine users, for example, social deprivation. Tackling this will require a political solution.

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Table 1. **Sociodemographic details of 131 crack dependent patients at the time of admission to a detoxification unit between 1992- 94.**		
Variables*	**N**	**%**
Gender: (n=131)		
male	116	88.5
female	15	11.5
Age [years]: (n=131)		
10 – 14	3	2.3
15 – 19	35	26.7
20 – 24	48	36.6
25 – 29	20	15.3
30 – 34	12	9.2
35 – 40	8	6.1
40 – 45	5	3.8
Race: (n=130)		
white	97	74.6
black	33	25.4
Civil status: (n=130)		
single	87	66.9
married	35	26.9
divorced	8	6.2
Schooling: (n=102)		
less than 8 years	57	55.9
8 years or more	45	44.1
Employed/studying (n =124)		
Yes	38	30.6
No	86	69.4

* Missing data for some variables are due to the absence of this information in the case-notes.
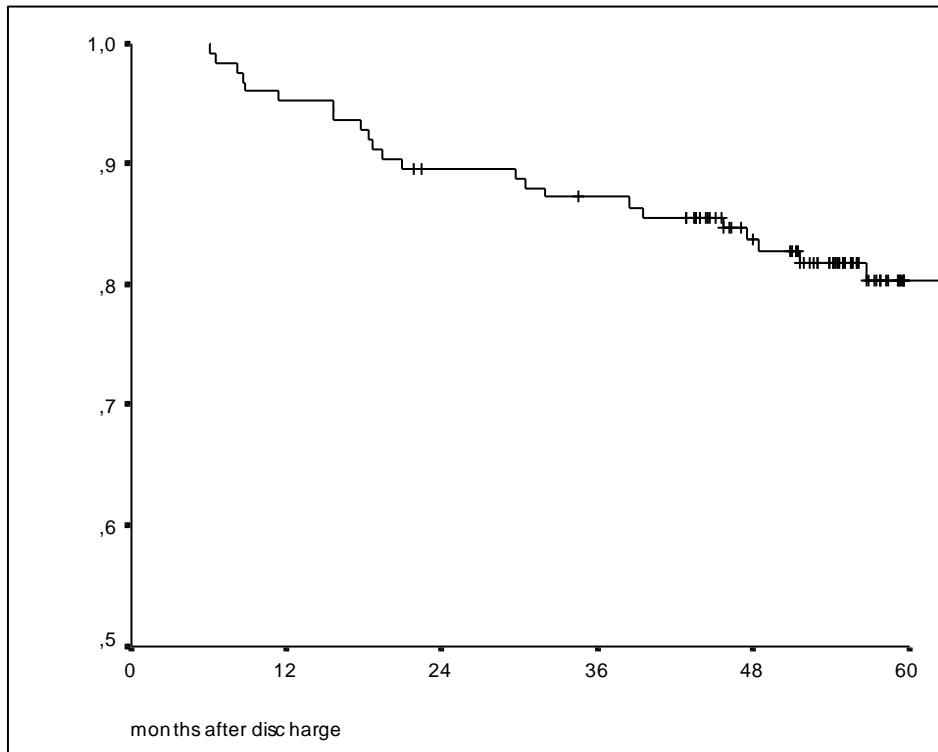
Figure 1: Survival curve of a sample of 126 crack dependent patients followed-up over 5 years in São Paulo, Brazil. The number of patients in risk, from the beginning of each interval was 126, 120, 111, 107, 86 and 39, respectively. The survival chance each year was 0,95 (CI 95% 0,91 – 0,99); 0,90 (CI 95% 0,84 – 0,94); 0,87 (CI 95% 0,81 – 0,93); 0,84 (CI 95% 0,77 – 0,91) and 0,80 (CI 95% 0,72 – 0,87).