

CONCURRENT USE OF ALCOHOL AND COCAINE: DIFFERENCES IN PATTERNS OF USE AND PROBLEMS AMONG USERS OF CRACK COCAINE AND COCAINE POWDER

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Abstract — **Aim:** To investigate differences in alcohol and drug consumption behaviours and related problems among users of cocaine powder versus crack cocaine. **Methods:** The sample of concurrent users of alcohol and cocaine ($n = 102$) was recruited from clinical and community (non-clinical) settings in London. Those recruited in the community were contacted by means of snowball sampling methods. Data were collected by means of face-to-face structured interviews. **Results:** Heavy drinking was common. There were differences in alcohol consumption between users of cocaine powder and crack cocaine. Cocaine powder users reported more frequent heavy drinking than crack users. Heavy drinking often involved drinking excessive amounts over prolonged periods. Crack cocaine users reported more serious problems associated with cocaine, other illicit drugs, psychological and physical health problems, and acquisitive crime. **Conclusions:** Frequent heavy drinking represents a serious risk to the health of many cocaine users. The differences in alcohol consumption patterns confirm the importance of distinguishing between use of cocaine powder and crack cocaine. Few of the sample had received treatment for cocaine or alcohol problems. Healthcare professionals working in primary care or accident and emergency settings may need to be trained to detect, assess, and respond to concurrent alcohol and cocaine problems.

INTRODUCTION

Alcohol and cocaine are frequently used together (Caetano and Weisner, 1995; Martin *et al.*, 1996). The use of both cocaine and alcohol has been reported among clinical samples of substance abusers in the US (Craddock *et al.*, 1997; Brooner *et al.*, 1997; Stitzer and Chutuape, 1999), in the UK (Gossop *et al.*, 1998), and in other countries (Ferri *et al.*, 2004). Use of alcohol and cocaine has been reported among the general population (Grant and Harford, 1990) and among specific samples such as those attending dance music events (Sumnall *et al.*, 2004). Animal studies have also found a relationship between the self-administration of alcohol and cocaine (Mierzejewski *et al.*, 2003).

Multiple substance use is receiving increasing recognition as an important topic for research and may involve either concurrent or sequential use of different substances (Gossop, 2001; Flanner *et al.*, 2004). The reasons for multiple substance use may include enhancement of effect, modification of effect (combined use to counteract the unwanted effects of one or more drugs), substitution (if the preferred drug is not available), or social (influenced by the social setting and the behaviour of other users).

When taken together, cocaine and alcohol interact to produce cocaethylene, an active metabolite with a half-life three times that of cocaine and which is more cardiotoxic (McCance *et al.*, 1995). The combined use of alcohol and cocaine can produce increased and prolonged subjective euphoria compared with the use of either substance on its own (Harris *et al.*, 2003). This may be owing to alcohol enhancing the effect of cocaine upon extracellular dopamine concentrations in the nucleus accumbens (Lindholm *et al.*, 2001). The combined use of the two substances may also offset some of

the sedating effects of alcohol as well as reducing the discomfort when coming down from cocaine (Pennings *et al.*, 2002).

Although there is a substantial literature on the concurrent use of alcohol and cocaine, few studies have distinguished between the use of alcohol with different forms of cocaine. The most commonly used forms of cocaine are cocaine powder (typically, cocaine hydrochloride), and crack cocaine. These tend to be used by different routes of administration. Cocaine hydrochloride is generally taken either by intranasal use or by injection and cannot effectively be smoked because this destroys much of the active form of the drug. Crack cocaine is typically (but not invariably) smoked. Cocaine powder and crack are associated with different adverse effects and other problems (Gold, 1993; Pottieger *et al.*, 1992; Gossop *et al.*, 1994; Hatsukami and Fischman, 1996; Ferri *et al.*, 2004).

The present study investigates drug and alcohol consumption behaviours and problems among concurrent users of alcohol and cocaine, and, in particular, differences in substance use and problems between drinkers who were also users of cocaine powder or users of crack cocaine.

METHODS

The study sample was chosen for current (last month) use of both alcohol and cocaine. Specific inclusion criteria were (i) use of alcohol in the previous 30 days and (ii) use of cocaine in the previous 30 days. Study participants were 110 people recruited from both clinical and community (non-clinical) settings in the greater London area.

Participants from clinical settings were recruited at a treatment centre providing services for drug misuse problems, including opiate dependence, stimulant problems, cannabis problems, and which also offered needle exchange services.

The community sample was contacted using snowball sampling methods. This involved the identification of alcohol and cocaine using individuals who were known to the research interviewers. Each contacted person was asked to nominate

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another suitable participant. This procedure has been used successfully in other studies of drug users (Biernacki, 1986; Forsyth, 1996). Interviews with the community sample were conducted in a range of settings, including the participant's homes, pubs, clubs, and other social settings.

Data were collected by face-to-face structured interviews. Measures were taken of basic personal and social demographics, and of drug and alcohol consumption behaviours, with specific attention to frequency, quantity, and patterns of use for alcohol, crack cocaine, and cocaine powder.

The target assessment period was the previous month (past 30 days). Measures of alcohol consumption included quantity (recorded in terms of standard units of alcohol with 1 U = 8 g of ethanol). Duration of drinking or drug taking episodes was assessed in number of hours.

The Severity of Dependence Scale (SDS) was used to measure dependence upon both alcohol and cocaine. The SDS is an easily administered 5 item scale, which can be used to assess dependence upon a range of substances, and has known psychometric properties (Gossop *et al.*, 1995; Kaye and Darke, 2002).

Measures were taken of drug problems and criminal behaviour. Psychological (anxiety and depression) and physical health problems were assessed using scales from the Maudsley Addiction Profile (Marsden *et al.*, 1998).

Participants were informed that the information provided would be anonymous and confidential, and that their participation was voluntary. All interviews were administered by research psychologists.

RESULTS

Of the 110 participants, 8 subjects reported use of both forms of cocaine, 69 reported using cocaine powder, and 33 reported use of crack cocaine. The main purpose of the study was to make comparisons of the characteristics, substance use, and other problems of the crack and cocaine powder users. For this reason, the eight participants who used both forms of cocaine were excluded from subsequent analyses.

Demographics

The study sample ($n = 102$) comprised 53 men (52%) and 49 women (48%). The mean age was 30.3 (SD 6.0) years. There was no difference between the crack cocaine and the cocaine powder user groups in age, sex, or relationship status (see Table 1). Crack cocaine users were significantly less likely to have completed their education, had fewer years in education, and had been in paid employment for fewer days than the cocaine powder users during the month prior to the interview.

Table 1. Characteristics of crack cocaine and powder cocaine users

Variable	Crack	Cocaine powder	t/χ^2	P -value
Age	31.9	29.6	1.59	0.12
Sex (male) (%)	61	48	1.46	0.23
Education (% completed)	21	50	7.57	<0.01
Years of education	12.2	15.2	5.13	<0.001
Employment (days)	6.7	26.9	9.04	<0.001
In relationship (%)	52	62	0.90	0.34

Alcohol use

Users of cocaine powder reported more frequent consumption of alcohol than the crack cocaine users (mean scores of 20.3 and 15.3 days, respectively). Among cocaine powder users, almost two-thirds (64%) reported drinking on 20 or more days. More than half (55%) of the crack cocaine users reported drinking on 15 days or less in the previous month.

There was a statistically significant difference between cocaine powder and crack users in the maximum amounts of alcohol consumed during a heavy drinking episode (22.8 and 15.2 U, respectively). There was no statistically significant difference between the two groups in quantity of alcohol consumed on a 'typical' drinking occasion (see Table 2).

More than one-third (35%) of the sample reported heavy drinking at least weekly during the previous month. Cocaine powder users were more frequent heavy drinkers. Almost half (46%) of the cocaine powder users reported heavy drinking at least weekly during the previous month compared with 13% of the crack cocaine users. More than half (52%) of the crack cocaine users reported no episode of heavy drinking compared with only 1% of the cocaine powder users.

Cocaine powder and crack cocaine users differed in the reported duration of the last heavy drinking session ($t = 3.85$, $P < 0.001$). Among cocaine powder users, 42% reported that their last heavy drinking episode had lasted for more than 12 h compared with 10% of crack users. Sixteen percent of cocaine powder users reported that their last heavy drinking session had lasted for more than 24 h compared with only one of the crack cocaine users.

Drug use

All cocaine powder users reported using cocaine by intranasal administration during the previous month. The majority (86%) of crack users reported using crack by smoking/chasing, but 14% also reported injecting crack.

Crack users reported more frequent use of cocaine than cocaine powder users (means of 21.5 and 8.5 days, respectively). There was no difference between the two cocaine groups in amounts used, nor in maximum duration of cocaine using episodes (Table 2). Many users in both groups reported at least one prolonged period of cocaine use in the previous month. More than a third of both cocaine user groups (38% of the cocaine powder users and 36% of the crack users) reported that their longest recent episode of cocaine use lasted for 24 h or more. SDS scores for cocaine were higher among crack than powder cocaine users [means, 7.3 (SD 3.4) and 3.7 (SD 3.8), respectively, $t = 4.64$, $P < 0.001$].

Crack cocaine users tended to use more illicit drugs than cocaine powder users. The mean number of drugs used, in addition to cocaine and alcohol, was 2.3 by crack users, and 1.5 by cocaine powder users. Additional drugs most often used by crack cocaine users included heroin (used by 67% of this group compared with 1% of powder users), and non-prescribed benzodiazepines (36% versus 7%). Among the additional drugs used by the cocaine powder users, the most commonly reported were amphetamines (used by 43% of this group compared with 3% of crack users) and ecstasy or other hallucinogens (19% of cocaine powder users compared with 3% of crack users). Cannabis use was common among

Table 2. Alcohol use and other factors associated with use of crack cocaine or powder cocaine

Variable	B	Wald	P-value	Odds ratio	95% CI
Frequency of drinking (days/last month)	-0.06	6.30	0.01	0.94	0.90–0.99
Frequency of heavy drinking	-0.78	18.72	<0.001	0.46	0.32–0.65
Typical' alcohol quantity (U)	-0.58	2.44	0.12	0.94	0.88–1.02
Maximum alcohol quantity (U)	-0.52	5.98	0.014	0.95	0.91–0.99
Frequency of cocaine use (days/last month)	0.21	27.68	<0.001	1.23	1.14–1.33
Maximum duration of cocaine use (h/last month)	0.01	1.81	0.18	1.01	0.99–1.02
Maximum quantity of cocaine use	0.003	0.27	0.60	1.00	0.99–1.02
Polydrug use	0.68	9.37	0.002	1.98	1.28–3.06
Drug problem days	0.24	9.47	0.002	1.28	1.09–1.49
Troubled by drug problems	0.87	17.25	<0.001	2.38	1.58–3.59
Physical health problems	0.14	15.09	<0.001	1.15	1.07–1.24
Psychological health problems	0.20	23.42	<0.001	1.22	1.13–1.33
Crime (days/last month)	0.43	3.65	0.06	1.53	0.99–2.37

both groups (74% of cocaine powder users compared with 70% of crack users).

Substance misuse, health, and crime problems

For the full sample, 62% reported no worries about their drug use: 12% reported being 'considerably' or 'extremely' troubled by their use of drugs in the previous month. Crack cocaine users were more likely to report drug problems and worries about their drug problems. Crack users reported more days on which they felt that they had a drug problem (Table 2). Crack users reported higher distress scores than the cocaine powder users in terms of feeling more subjectively troubled by their drug problems.

Previous lifetime contact with alcohol treatment services was reported by only two (3%) of the powder cocaine users and five (15%) of the crack cocaine users. Previous contact with drug treatment services was reported by only one of the powder cocaine users and by 23 (70%) of the crack cocaine users. This was seldom for treatment of a cocaine or other stimulant problem (none of the cocaine powder users and two of the crack cocaine users).

Crack users scored higher than the cocaine powder users on measures of physical health problems and psychological health problems (Table 2). The mean physical health scores were 7.6 (SD 4.7) for the cocaine powder users and 14.0 (SD 8.8) for the crack cocaine users. The mean psychological health scores were 6.1 (SD 4.9) for the cocaine powder users and 15.9 (SD 8.9) for the crack cocaine users.

There was a statistically significant difference between the two cocaine user groups in terms of number of days during the previous month on which they reported acquisitive crimes, with crack users reporting more crime days (6.9) than the cocaine powder users (0.04) ($t = 3.01$, $P < 0.01$). For driving offences (e.g. driving under the influence of drink or drugs), cocaine powder users scored higher than the crack users (3.0 and 0.1, respectively; $t = 4.20$, $P < 0.001$).

DISCUSSION

Heavy drinking was found among many concurrent users of cocaine and alcohol. This is consistent with findings from other studies that have shown heavy drinking among cocaine users (Grant and Harford, 1990; Caetano and Weisner, 1995;

Craddock *et al.*, 1997). The results also show important differences in alcohol consumption between users of cocaine powder and crack cocaine. For both research and clinical assessment purposes, it is important to differentiate between types of cocaine use when assessing alcohol consumption among these multiple substance users.

Cocaine powder users reported more frequent drinking and more frequent heavy drinking than the crack cocaine users. Episodes of heavy drinking often involved drinking excessive amounts of alcohol over prolonged periods. Almost half of the cocaine powder users reported drinking heavily at least once a week during the previous month, with about one in six reporting a drinking episode that lasted for >24 h, and with peak alcohol consumption levels of as much as 23 U (equivalent to ~184 g of ethanol). The regular consumption of such large amounts of alcohol represents a serious risk to the health of these substance users. In view of the fact that just over half of the cocaine powder users were women, this gives greater emphasis to concerns about the adverse effects of heavy drinking among this group.

Although crack cocaine users were less likely than the cocaine powder users to be heavy drinkers, they reported more frequent use of cocaine and higher levels of dependence upon cocaine. Other studies have found severity of cocaine dependence to be related to route of administration with users of crack cocaine reporting higher levels of dependence than users of powder cocaine (Gossop *et al.*, 1994). However, both groups of cocaine users reported recent episodes of prolonged (>24 h) cocaine use.

Whereas cocaine powder users were more likely to report frequent heavy drinking, crack cocaine users were more likely to report other problems. For example, the crack users were more likely to use other illicit drugs in addition to their alcohol and cocaine—often drugs with powerful sedative-type effects, such as heroin and benzodiazepines. The concurrent use of alcohol with drugs such as opiates and benzodiazepines is associated with specific risks. Drug overdose, for instance, continues to be one of the most frequent causes of death among drug misusers (Frischer *et al.*, 1993; Hall and Darke, 1998), and the combined use of alcohol with heroin and benzodiazepines significantly increases the risk of overdose (Gossop *et al.*, 2002b). Where additional drugs were used by the cocaine powder users, this tended to involve other stimulants such as ecstasy and amphetamines.

The present study is subject to a number of limitations. The sampling procedures are opportunistic and neither the clinical nor the community samples can be regarded as representative. Also, there are known socio-economic and other differences between the crack and cocaine powder users, and it is possible that these may have influenced the observed patterns of alcohol and cocaine use. The use of crack cocaine has been found in other studies to be specifically related to poorer psychological health (Ferri and Gossop, 1999) and to poor health outcomes (Des Jarlais *et al.*, 1992; Gossop *et al.*, 2002a). It is unclear in the present study whether the higher levels of physical and psychological health problems among the crack cocaine users were associated with their lifestyles, their use of crack cocaine in particular, or more generally, with their polydrug use.

There may be pharmacological reasons for concurrent use of multiple substances. Insofar as cocaine users may be using other substances to counteract the agitation and other adverse effects which may occur during prolonged use of cocaine, it is possible that the heavy drinking of the cocaine powder users, and the heroin and/or benzodiazepine use of the crack cocaine users may be different pharmacological devices to produce the same effect. The reasons for concurrent use of alcohol or other drugs with cocaine deserve further research attention.

The findings of the present study confirm the importance of the differences in both user characteristics and in drug-related problems, which have been found between users of cocaine powder and crack cocaine (Gossop *et al.*, 1994; Hatsukami and Fischman, 1996). In addition to the differences in substance use reported above, the crack cocaine users tended to have poorer educational histories, they were less likely to be in formal employment, and they were more likely to report involvement in acquisitive crime. Other studies have shown high rates of criminal involvement among crack cocaine users (Ferri and Gossop, 1999; Gossop *et al.*, 2002).

Despite the frequent heavy drinking, cocaine use, and drug-related and other social problems reported by many study participants, the majority (61%) reported no concerns about their use of drugs. Few reported having received treatment for cocaine or alcohol problems. Contact with substance misuse treatment services was more common among the crack cocaine users. This tended to be with drug (rather than alcohol) treatment services and was generally for the treatment of problems involving drugs other than stimulants (typically for opiate problems).

Drug misuse treatment services in the UK are predominantly geared towards the needs of clients with opiate dependence, though stimulant misuse problems are also common among drug dependent patients (Gossop *et al.*, 2000). It remains unclear to what extent existing drug treatment services address the needs of multiple substance users who have problems related to the use of alcohol and cocaine. Although reductions in the use of crack cocaine have been found after drug misuse treatment (Gossop *et al.*, 2002a; Simpson *et al.*, 2002), drinking outcomes among drug misusers after treatment have been found to be relatively poor (Gossop *et al.*, 2003a). The continued heavy drinking of many clients after treatment contrasts with the improved outcomes for use of illicit drugs (Hubbard *et al.*, 1989; Lehman and Simpson, 1990; Chatham *et al.*, 1997; Gossop *et al.*, 2003b).

It is unclear what future developments might be expected for our sample in terms of their use of alcohol and cocaine. Some could be expected to give up or moderate their use of these substances. Treatment contact was rare in our sample, especially among the users of cocaine powder. It is possible that the greater social integration and resources of the cocaine powder users may, to some extent, have protected them from some of the consequences of their heavy alcohol and cocaine use. Many people, including those with relatively serious alcohol or cocaine problems may give up without treatment (Tuchfeld, 1981; Waldorf *et al.*, 1991). Others may go on to develop a more serious alcohol or cocaine problem which requires treatment.

Contact with treatment may be with primary care services, and GPs should be alert to problems related to the concurrent use of cocaine and alcohol. In view of their relatively frequent driving under the influence of drink or drugs, cocaine powder users are at increased risk of road traffic accidents and may also be seen in accident and emergency departments. Healthcare professionals working in such settings may need enhanced training to improve their ability to detect, assess, and respond to those with concurrent alcohol and cocaine problems.

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