CRACK-COCAINE USERS AS VICTIMS OF PHYSICAL ATTACK

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This study evaluates the correlates of physical attack among people who use crack cocaine in Dayton, Ohio. Using a retrospective and prospective natural history design, data from baseline and 1-year follow-up interviews were used to calculate the prevalence of physical attack and the annual rate of physical attack suffered by 440 not-in-treatment crack-cocaine users. Logistic regression was used to determine the correlates of physical attack. The lifetime prevalence of physical attack was 63.0%; the annual rate was 36.8%. At baseline, daily crack users were more likely to report a previous attack since they began using crack (odds ratio [OR], 1.81; 95% confidence interval [CI], 1.18–2.77). Longer duration of crack use was also associated with experiencing an attack (OR, 1.09; 95% CI, 1.04–1.14). Between baseline and 12-month follow-up, the odds of men being attacked were significantly less than those for women (OR, 0.48; 95% CI, 0.23–0.99). Physical attack is widespread among crack-cocaine users, and does not vary by ethnicity. Injuries often result in the need for medical care. Over the short term, women are at increased risk. Accessible and effective drug abuse treatment is needed to diminish the harm this population suffers. (J Natl Med Assoc. 2000;92:76–82.)

Key words: substance abuse ◆ violence ◆ crack

Survey research on the epidemiology of drug use in the United States estimates that more than 4 million people have used crack cocaine at least once in their lifetimes and 1.3 million individuals use it annually.[1] Crack cocaine has been linked to violence in the popular as well as the scientific press.[2] Having a large number of people involved with a drug that is often associated with violence presents a major concern for public health. A review of the literature comparing the effects of crack and cocaine hydrochloride concluded that violence is more often associated with crack rather than powdered cocaine, although the reasons for such differ-

ences are not clear.[3] A study of homicides committed in New York City suggested that the high mortality rates among young minority group members were related to the victim's involvement with cocaine and firearms.[4] Ethnographic research conducted inside as well as outside of New York City has characterized the crack life as a violent one.[5–8]

Explanations for the crack-violence nexus have ranged from the pharmacologic to the cultural and economic. One model that has gained some acceptance is the tripartite model.[3,9] It posits that the complex relationship between illicit drug use and violence can be understood partially by examining the interrelationship among psychopharmacologic, economic, and sociologic factors.[9] In a study comparing violence among cocaine users and nonusers in New York City, the developers of the tripartite model found that the amount of violence was similar among users and nonusers, although users were more likely to have reported that their violence was drug and alcohol related.[10]

Although crack, violence, and even homicide have been linked, little is known about the epidemiology of violence among crack users. The data presented here are from an on-going, 5-year natural history study of crack-cocaine users. The sample is composed of 440 not-in-treatment crack users who were recruited in the Dayton, Ohio, area. The paper presents data on the prevalence of being a victim of a physical attack since crack use was initiated, the incidence of victimization over a 12-month follow-up period, the use of medical care after suffering an attack, and weapon carrying. The relationship between sample characteristics and victimization at baseline and at 12-month follow-up is also examined.

MATERIALS AND METHODS
Sampling

Dayton, a medium-sized city with 173,000 inhabitants, is located in a metropolitan area of 950,000 people in southwestern Ohio. Individuals in this study were 269 men and 171 women who, between July 1996 and August 1997, entered a natural history study designed to examine crack-cocaine smokers' use of health services. A targeted sampling plan was developed to recruit participants.[11] Targeted sampling has been recommended for use in studies involving "hidden" populations to increase the representativeness of samples, because random sampling among active street drug users is not possible.[12,13] The plan employed a triangulation methodology that used independent data sources (i.e., drug treatment admissions, arrests, the incidence of sexually transmitted diseases, and ethnographically collected field indicators, such as drug selling areas) to estimate the relative density of crack users in all zip codes in Montgomery County. Proportional sampling quotas were then based on the estimated density. Outreach workers searched areas designated by the targeted sampling plan where they identified potential participants and explained the project to them. Interviews were conducted at the project site office, after eligibility was verified. Obviously, intoxicated individuals were not interviewed.

To be eligible for the study, subjects had to: 1) be at least 18 years old; 2) not be in a drug abuse treatment program; 3) not be living in a homeless shelter; 4) have no history of injection drug use; 5) have no criminal charges pending; and 6) be a current user of crack cocaine. Recent use was corroborated by a positive result on Roche's OnTrak™ urine screen for cocaine. The absence of a history of drug injection was established by self-report and interviewer observation of the subjects' arms for the presence or absence of track marks or recent injection sites.

Informed consent following a protocol that was approved by Wright State University's Institutional Review Board was obtained in writing from all participants. Participants received nominal compensation for the time spent responding to the interview.

Interviews

All subjects responded to a baseline questionnaire that was administered by trained interviewers. The questionnaire, lasting an average of 2 hours, contained items generated by the authors as well as questions taken from other well-known instruments. Data were collected on a variety of areas, including sociodemographic characteristics, the frequency and duration of nonmedical drug use, the history of being physically attacked, the use of medical care after such an attack, and weapon carrying. Follow-up interviews, using a questionnaire comparable to the baseline instrument, were conducted at 6-month intervals over a 12-month period.

At baseline, history of physical attack was determined by asking: "Since you have been using crack, have you ever been physically attacked by someone?" with "yes" and "no" response options. In addition, participants were also asked: "Since you have been using crack, have you ever been forced to have vaginal, oral, or anal sex against your will?" with "yes" and "no" response options. In the follow-up interviews, "Since your last interview here . . . " replaced "Since you have been using crack. . . . " In all interviews subjects were asked if they went for medical care subsequent to an attack.

Frequency of drug use was determined by asking: "During the past 6 months how often would you say that you used [drug in question]?" The response options were: 1) no use (for drugs other than crack at baseline and all drugs at follow-up); 2) less than 4 times per month; 3) about 1 time a week; 4) 2 to 6 times per week; 5) about 1 time a day almost every day; 6) about 2 to 3 times per day almost every day; and 7) 4 or more times per day almost every day. Duration of drug use was determined by asking:

"About how many total years would you say you have used [drug in question]?"

Weapon carrying was assessed at baseline and follow-up by asking: "Do you ever carry a weapon?" If affirmative, respondents were asked if they carried a gun, knife, or something else.

Follow-up Rates

At 6-month follow-up, 378 (85.9%) subjects returned to the project field office for an interview; 371 (84.3%) returned for the 12-month interview. Our prospective analyses focused on the 348 (79.1%) participants who returned for both follow-up interviews.

Analysis

Univariate statistics were used to describe the characteristics of the sample. Regarding drugs, the analysis was limited to crack cocaine and alcohol, since they are the most widely used drugs that traditionally have been associated with violence.[14] Frequency of alcohol and crack use was collapsed into daily and nondaily categories. While the frequency of use reported at baseline determined the categorization for the retrospective analysis, at the follow-up interviews an individual had to report having used crack or alcohol on a daily basis for both 6-month periods to be considered a daily user for the prospective analysis. Physical attack was defined as having sustained either a physical attack or a sexual assault and was measured dichotomously.

Statistical analyses were carried out using SAS software.[15] Logistic regression analyses were used to:

1. Assess the relationship between sample characteristics and physical attacks that occurred before the baseline interview, since crack use was initiated; and
2. Determine the predictors of physical attacks that occurred in the 12-month period after baseline.

The annual rate of physical attack was calculated by determining the number of people who reported suffering either a physical attack or a sexual assault between their baseline and 12-month interviews and dividing this by the number of people exposed to the risk of attack—348. This was the number of subjects who completed both 6- and 12-month interviews. The overall prevalence of attack since

crack use was initiated was calculated in the following manner. The number of individuals who reported experiencing a physical attack prior to baseline was added to the number of subjects who reported an attack for the first time between baseline and 12-month follow-up. This sum was then divided by the total sample size ($n = 440$).

The association between attack and weapon carrying was explored using bivariate statistics.

RESULTS

The characteristics of the sample are displayed in Table 1. Men made up 61.1% of the sample. The mean age for men was 38.4 years, for women 35.9 years. Ethnically, 61.8% of the subjects were black. Nearly 50% reported less than a high school education; 13% reported full-time employment. Being married or living as married was reported by 27.5% of the participants. In the 6 months prior to the baseline interview, 60.5% of the sample used crack daily, and 42.3% used alcohol daily. The mean duration of crack use was 7.9 years (mode = 10 years; median = 8 years).

At baseline, experiencing a physical attack since crack use was initiated was reported by 231 (52.5%) people. Of these, 49 (21.2%) people were victims of a sexual assault; 44 of these individuals were women. About 45% of those people who experienced a physical attack sought medical care. Guns and/or knives were carried by 32.0% of the sample; 7.5% carried a gun only, 4.5% carried a gun and knife, and 20% carried a knife only. An additional 13 people (3.0%) carried weapons such as garrotes, brass knuckles, or hammers. As such, 35% of the sample reported being armed.

Over the 12-month follow-up period, 128 (36.8%) people were attacked ($n = 348$). Of these, 46 people had no prior history of victimization. In addition, 20 of the 128 people attacked since baseline were sexually assaulted; 15 of these people were women. Medical care was sought by 33.6% of those people who suffered a physical attack. Since crack use was initiated, the lifetime prevalence of physical attack through the 12-month follow-up period was 63.0%. Similar to the baseline findings, at 12-month follow-up, guns and/or knives were carried by 29.6% of the sample.

Table 2 shows the results of the baseline logistic regression on physical attacks that occurred since crack use was initiated. Daily crack users were more

Table 1. Baseline Characteristics of Crack-Cocaine Users (n = 440)

	No. (%)
Gender	
Women	171 (38.9)
Men	269 (61.1)
Age	
<30 years	63 (14.3)
30–39 years	214 (48.6)
40+ years	163 (37.0)
Ethnicity	
White	168 (38.2)
Black	272 (61.8)
Education*	
<High school	217 (49.4)
High school	121 (27.6)
College	101 (23.0)
Employment	
Unemployed	383 (87.0)
Employed	57 (13.0)
Marital status	
Single/separated/divorced	319 (72.5)
Married/living as married	121 (27.5)
Frequency of crack use	
Daily	266 (60.5)
Nondaily	174 (39.5)
Frequency of alcohol use	
Daily	186 (42.3)
Nondaily	254 (57.7)
Duration of crack use	
<5 years	109 (24.8)
5–10 years	168 (38.2)
10+ years	163 (37.0)
Physically attacked	
Yes	231 (52.5)
No	209 (47.5)
Medical care after attack	
Yes	103 (44.6)
No	128 (55.4)
Carries gun/knife	
No	299 (68.0)
Yes	141 (32.0)

*Missing data.

Table 2. Results of the Logistic Regression: Determinants of Previous Attack (n = 440)

	OR (95% CI)
Gender	
Male	1.10 (0.72–1.67)
Female	1.00
Age	0.98 (0.95–1.01)
Ethnicity	
Black	0.72 (0.46–1.12)
White	1.00
Education	1.24 (0.97–1.60)
Employment	
Employed	1.27 (0.69–2.32)
Unemployed	1.00
Marital Status	
Married	0.72 (0.46–1.13)
Single	1.00
Frequency of crack use	
Daily	1.81 (1.18–2.77)
Nondaily	1.00
Frequency of alcohol use	
Daily	1.90 (1.25–2.88)
Nondaily	1.00
Duration of crack use	1.09 (1.04–1.14)

Goodness of fit statistic = 12.43, 8 df, p = 0.13.
Note: age, education, and duration of crack use were treated as continuous variables.

likely than nondaily users to report a previous attack (OR, 1.81; 95% CI, 1.18–2.77), and daily alcohol users were more likely to report an attack (OR, 1.90; 95% CI, 1.25–2.88). In addition, individuals with longer periods of crack use were more likely than those with shorter durations of use to report a history of attack (OR, 1.09; 95% CI, 1.04–1.14).

Table 3 shows the results of the logistic regression that examined the predictors of physical attacks that occurred between baseline and 12-month follow-up. Only gender was found to have a significant effect on attack. The odds of men being attacked were significantly less than those for women (OR, 0.48; 95% CI, 0.23–0.99).

The results of the bivariate analyses showed a positive association between physical attack and weapon carrying at baseline (χ^2 = 7.05, df = 1, p = 0.008), and a similar association was found at 12-month follow-up (χ^2 = 11.11, df = 1, p = 0.001).

DISCUSSION

To our knowledge, this is the first study to assess the occurrence of physical attack experienced by crack-cocaine users. The results demonstrate that violence is very common among this population and does not vary by ethnicity. At baseline, more than half of the sample (52.5%) reported having experienced a physical attack since they became involved with crack. It appears that many of the attacks were serious, since 44.6% of the victims reported seeking medical care for their injuries.

Table 3. Results of Logistic Regression: Predictors of Attack (n = 348)

	OR (95% CI)
Gender	
Male	0.48 (0.23–0.99)
Female	1.00
Age	0.99 (0.95–1.04)
Ethnicity	
Black	0.52 (0.23–1.19)
White	1.00
Education	0.97 (0.60–1.57)
Employment	
Employed	0.85 (0.27–2.67)
Unemployed	1.00
Marital status	
Married	1.11 (0.51–2.42)
Single	1.00
Frequency of crack use	
Daily	1.36 (0.55–3.34)
Nondaily	1.00
Frequency of alcohol use	
Daily	1.62 (0.66–3.98)
Nondaily	1.00
Duration of crack use	1.62 (0.66–3.98)

Goodness of fit statistic = 3.51, 8 df, p = 0.90.
Note: age, education, and duration of crack use were treated as continuous variables.

Between the baseline and the 12-month follow-up interviews, 128 subjects reported a physical attack, pushing the overall prevalence rate to 63.0% since crack use was initiated. The annual rate of physical attack was 36.8%. Of those who were attacked during the 12-month prospective follow-up period, 33.6% sought medical care.

In all likelihood, the rates of attack reported here are underestimated. This study used data from individuals who returned for both 6- and 12-month follow-ups, thereby excluding data from individuals who returned for only 1 of the follow-ups and those who were not recaptured.

The results of the multivariate analysis on physical attacks that occurred prior to baseline show that individuals who were daily users of crack or alcohol were significantly more likely than nondaily users to have reported a history of physical attack. In addition, people with longer histories of crack use were more likely to have been the victims of physical violence. As such, the longer a person is a part of the crack life, the more likely he or she will become

the victim of physical violence. Unfortunately, the causal relationship between drug use practices at baseline and the history of physical attack cannot be ascertained because of the time-order issue. In other words, the frequency of crack-cocaine use reported at baseline may or may not have been the frequency with which the drug was being used at the time the user suffered the attack. Consequently, the drug use practices reported at baseline cannot be linked causally to attack. However, if the alcohol and crack use patterns that were reported at baseline reflect past use patterns, then it is not unreasonable to suggest that a high frequency of crack or alcohol use may predispose individuals to the risk of physical victimization. At the same time, high frequencies of crack or alcohol use may reflect a response to being a victim, particularly of sexual assault.[16]

The findings from the logistic regression on the predictors of attack in the 12-month follow-up point to the greater vulnerability of crack-using women in the short term. Also, the frequency and duration of drug use variables that were associated with a history of physical attack at baseline did not predict attack in the year after baseline. These findings may be explained by suggesting that 1 year is simply too short of a time period for the patterns seen at baseline to become manifest. If so, this would suggest that the gender difference would evaporate over time, and the high frequency drug use behaviors would reassert themselves as predictors of attack. Regardless, when considering the results of the two regressions together, it appears that age, ethnicity, education, employment, and marital status offer crack users no immunity from becoming the victims of physical attack.

At baseline, almost one-third (32.0%) of the participants reported arming themselves. Gun carrying was reported by 12% of the sample; another 23.4% reported carrying knives. The pattern of weapon carrying persisted at 12-month follow-up. This is alarming, because weapons increase the capability of inflicting very serious injury.

The relationship between physical attack and weapon carrying is complicated. With the current data, we cannot determine if people who carry weapons are more likely to become victims of a physical attack (because they attack others and suffer retaliation) or if victims are more likely to arm themselves in response to a previous physical attack. Nevertheless, there is a positive relationship at base-

line and 12-month follow-up between a history of physical attack and carrying a gun and/or knife. If previous victims are attacked in the future, the potential for serious injury would increase by weapon carrying.

This study's findings have several limitations. First, this research relied on self-reports of illegal behavior. There is evidence to suggest that overreporting or underreporting occur in such research depending on a variety of factors, including the population being queried, the method of questionnaire administration, and where the questioning takes place.[17] Some of these may have been mitigated by the administration of urine tests to confirm drug use, not having a behavior change intervention (which would increase the likelihood of providing socially desirable responses), and the use of highly trained interviewers. Second, the sample was not a random one. Nevertheless, the sample contains a mix of white and black men and women who exhibited a range of crack use patterns. As such, there is no reason to believe that the sample is atypical of crack-using populations with similar ethnic and gender compositions in medium-sized cities. Caution is in order when extrapolating these findings to larger or smaller cities because the social ecologies of their crack scenes may be different, thereby affecting the level of crack-related violence occurring. It must also be acknowledged that areas identified for subject recruitment are economically poor ones. Beyond employment status, no attempt was made to distinguish the effects of socioeconomic status on victimization.

It is also important to point out that the term "physical attack" is used broadly and encompasses acts of violence ranging from a single punch or kick to a bullet or knife wound. Consequently, it is difficult to gauge the severity of the violence, although the fact that so many victims sought medical care suggests seriousness. Also, sexual assault was included under the rubric of physical attack because sexual assault is first and foremost an act of violence. Another study is needed to examine the correlates of sexual assault of women. Finally, this study focused on the victims of physical violence. We do not know the identity or drug using behaviors of the perpetrators of such violence. Moreover, we did not evaluate the occurrence of violence perpetrated by our participants.

CONCLUSION

The prevalence and annual rate of physical attack data, coupled with the weapon carrying data presented in this study only partially convey the danger permeating the crack life. Since this study began in 1996, to our knowledge five subjects have died. Death certificates indicate that two people were murdered, two died from drug-related causes, and one fell from a cliff. The findings on the high rates of physical victimization and the deaths detailed in this research highlight the public health risks associated with the crack life. The clearest answer is, perhaps, the most self-evident one: users must be encouraged to terminate drug use and remove themselves from the crack life. This argues strongly for the provision of accessible and effective community-based drug abuse treatment. It also demands that drug abuse treatment be provided in jails and prisons because incarceration has been a major strategy in addressing the nation's drug abuse problem. Until their addiction to crack cocaine is addressed, these drug abusers will continue to harm themselves and others and profoundly tax the country's health care resources.

The findings of this study have direct and immediate practical implications. They again highlight the connection between substance abuse and violence.[18] Because the emergency room is likely to be the site of medical care for drug-abusing populations, persons presenting with injuries that may have been caused by a violent encounter should be carefully screened for substance abuse. If there is any suspicion, then they should be linked with an appropriate treatment provider. The emergency room can be an excellent location to effect such an intervention.[19,20]

ACKNOWLEDGMENTS

REFERENCES

1. Department of Health and Human Services. *National Household Survey on Drug Abuse: Population Estimates 1997.* Washington, DC: Department of Health and Human Services; 1998: (SMA)98:3250.

2. Inciardi JA. *The War on Drugs II: The Continuing Epic of*

Heroin, Cocaine, Crack, Crime, AIDS, and Public Policy. Mountain View, CA: Mayfield Publishing Company; 1992.

3. Hatsukami DK, Fischman MW. Crack cocaine and cocaine hydrochloride: are the differences myth or reality? *JAMA.* 1996;276:1580–1588.

4. Tardiff K, Marzuk PM, Leon AC, et al. Homicide in New York City: cocaine use and firearms. *JAMA.* 1994;272:43–46.

5. Bourgois P. *In Search of Respect: Selling Crack in El Barrio.* Cambridge: Cambridge University Press; 1996.

6. Carlson RG, Siegal HA. The crack life: an ethnographic overview of crack use and sexual behavior among African-Americans in a midwest metropolitan city. *J Psychoactive Drugs.* 1991; 23:11–20.

7. Dunlap E, Johnson BD. The setting for the crack era: macro forces, micro consequences (1960–1992). *J Psychoactive Drugs.* 1992;24:307–321.

8. Ratner MS, ed. *Crack Pipe as Pimp: An Ethnographic Investigation of Sex-for-Crack Exchanges.* New York, NY: Lexington Books; 1993.

9. Goldstein PJ. The drugs/violence nexus: a tripartite conceptual framework. *J Drug Issues.* 1985;15:493–506.

10. Goldstein PJ, Belluci PA, Spunt BJ, Miller T. Frequency of cocaine use and violence: a comparison between men and women. In: Schober S, Schade C, eds. *The Epidemiology of cocaine Use and Abuse.* NIDA Res Monogr 110. Department of Health and Human Services publication (ADM) 91-1787. Washington, DC: U.S. Government Printing Office; 1991:113–138.

11. Siegal HA, Falck RS, Carlson RG, Wang J, Rahman A.

Health services research among crack-cocaine users: a case study from the Midwest. *Am Behav Scientist.* 1998;41:1063–1078.

12. Watters JK, Biernacki P. Targeted sampling: options for the study of hidden populations;. *Soc Probl.* 1989;36:416–430.

13. Carlson RG, Wang J, Siegal HA, Falck RS, Guo J. An ethnogrphic approach to targeted sampling: problems and solutions in AIDS prevention rersearch among injection drug and crack-cocaine users. *Hum Organ.* 1994;53:279–286.

14. Reiss AJ Jr, Roth JA, eds. *Understanding and Preventing Violence.* Washington, DC: National Academy Press; 1993.

15. SAS Institute, Inc. *SAS Technical Report P-229; SAS/STAT Software: Changes and Enhancements.* Release 6.07. Cary, NC: SAS Institute; 1992.

16. Boyd CJ, Hill E, Holmes C, Purnell R. Putting drug use in context: lifelines of African American women who smoke crack. *J Subst Abuse Treat.* 1998;15:235–249.

17. Aquilino WS. Interview mode effects in surveys of drug and alcohol use: a field experiment. *Public Opin Q.* 1994;58:210–240.

18. Friedman AS. Substance use/abuse as a predictor to illegal and violent behavior: a review of the relevant literature. *Aggression and Violent Behavior.* 1998;3:339–355.

19. Padgett DK, Struening EL. Influence of substance abuse and mental disorders on emergency room use by homeless adults. *Hosp Community Psychiatry.* 1991;8:834–888.

20. Bluestone H, Melinek M. Effects of the urban crisis on the community general hospital. *Hosp Community Psychiatry.* 1982; 6:477–480.