Assessment of Cocaine Use in Patients With Chest Pain Syndromes

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Background: Patients with myocardial ischemia may have different dispositions and/or pharmacologic interventions based on whether they have recently used cocaine.

Objective: To determine the prevalence of assessment of cocaine use in patients with acute chest pain syndromes.

Methods: In phase 1 of the study, we reviewed the medical records of all patients with chest pain who presented to the emergency department during February 1996 to assess historical documentation of the presence or absence of cocaine use. In phase 2, we evaluated whether cocaine questions were asked but not documented. After hospital admission, patients were interviewed to see if they were asked about cocaine use. In phase 3, we evaluated possible recall bias by using standardized questioning in the emergency department and used subsequent interviews to assess recall. Assessment of other cardiac risk factors served as the comparison group.

Results: In phase 1, 129 charts were reviewed, 13% of which revealed myocardial infarction. The presence or absence of cocaine use (13%) was less frequently documented than the presence or absence of hypercholesterolemia (58%), hypertension (82%), smoking (90%), diabetes (73%), or family history (77%) ($\chi^2$, $P<.05$ for all comparisons). In phase 2, 27 (31%) of the 86 patients who were interviewed recalled cocaine questioning. There was chart documentation of the cocaine questioning in only 44% of the 27 cases. In phase 3, while in the emergency department, 20 patients were asked about cocaine use: 19 (95%) recalled being asked about cocaine use when interviewed the next day.

Conclusions: Patients with chest pain often are not asked about recent cocaine use. When they are asked, their answers are poorly documented. These findings cannot be explained by poor recall. In cases of chest pain, efforts to improve questioning of patients about cocaine use are needed, since recent cocaine use may change treatment, disposition, and need for counseling.

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Cardiovascular disease affects an estimated 6 million persons in the United States each year, resulting in approximately 500,000 deaths annually. Over the past half century, multiple investigations have shown that sex, tobacco use, hypertension, a family history of premature atherosclerotic disease, hypercholesterolemia, and hyperglycemia increase the risk of underlying coronary artery disease. These risk factors predict the likelihood of future development of coronary artery disease but are of limited value in the acute care setting.

In the emergency department (ED), they do not help stratify patients with chest pain into groups at high or low risk for acute myocardial infarction. Myocardial infarction was first noted in association with cocaine use in 1982. Since that time, more than 250 cases of myocardial infarction have been attributed to cocaine use. Recent investigations have shown that cocaine use is both an acute and a chronic cardiac risk factor. Acutely, cocaine increases coronary artery vasoconstriction, myocardial oxygen demand, platelet aggregation, and thrombus formation. As a result, cocaine use can result in acute myocardial infarction, even in the absence of underlying coronary artery disease. Long-term users may develop left ventricular hypertrophy and atherosclerosis, possibly placing them at higher risk for future ischemic events.

The evidence that cocaine use may result in myocardial ischemia, along with the recognition that the pharmacologic treatment and disposition of patients with myocardial ischemia may differ depending on whether the patient has recently used cocaine, has led to recom
PATIENTS AND METHODS

We performed a 3-phase cross-sectional study to assess attempts by physicians and nurses to obtain a history of recent cocaine use in patients who present to the ED with chest pain syndromes. This study was conducted at the University Medical Center (Stony Brook, NY), a tertiary referral hospital with an annual ED census of 47,000 patients, an active cardiac catheterization service, and a cardiac referral base serving 12 community hospitals in Suffolk County, New York. The study protocol was approved by the University Medical Center Research Committee and the University Medical Center Committee on Research Involving Human Subjects.

The study was conducted in 3 phases. In phase 1 (documentation phase), patients who presented to the ED with chest pain syndromes during February 1996 were identified at the time of presentation by the ED academic associates (trained research assistants) who staff the ED between the hours of 8 AM and midnight, 7 days a week. Between midnight and 8 AM, when our census is less than 15% of our daily volume, the ED nurses and physicians are responsible for patient study enrollment. We assessed historical documentation of the presence or absence of traditional cardiac risk factors (eg, hypertension, diabetes mellitus, hypercholesterolemia, tobacco use, and family history of premature coronary artery disease) and cocaine use in ED physician and nursing notes, as well as in inpatient physician, nursing, and consultation notes. All charts were reviewed by a single chart abstractor (D.E.B.) who was specifically trained for this project. A sample of charts was reviewed by a second investigator (J.E.H. or S.M.V.) to confirm accuracy.

In phase 2, we evaluated the possibility that patients may have been questioned about cocaine use but that this information was not documented in the charts. We interviewed all patients who had electrocardiograms with ST-segment elevations greater than 1 mm or elevations in creatine kinase–MB isoenzyme levels after hospital admission. We selected this patient cohort because these patients are more likely to sustain a myocardial infarction and because sicker patients would be more likely to have their treatment altered by knowledge of recent cocaine use. These patients would also be less likely to receive β-antagonists and thrombolytic agents, which in the setting of cocaine use could lead to a potentially higher risk of adverse outcomes or an increased prevalence of false-positive ST-segment elevations.

During the phase 2 interview, the patients were asked the following question: “Since you arrived at the hospital this time, has anyone asked you anything about cocaine use?” If the answer was yes, the patient was queried to determine whether the questioning occurred in the ED or after transfer to a hospital bed. In addition, patients were asked whether it was a physician or nurse who inquired. After the patient’s hospital release, the medical records were reviewed to determine the prevalence of documentation of cocaine use and other cardiac risk factors, as described in phase 1.

In phase 3, we evaluated possible recall bias. Patients who presented to the ED with a chief complaint of chest pain were questioned specifically about cocaine use, hypertension, and diabetes by a single examiner. These patients were interviewed the following day, as described in phase 2.

The data were entered into a database (Access 95, Microsoft Inc, Redmond, Wash) and imported into SPSS for Windows (SPSS Inc, Chicago, Ill) for statistical analysis. In phase 1 (historical documentation phase), the data were presented as the percentage of patients with historical documentation of each of the cardiac risk factors. Fisher exact or χ² tests were used to compare documentation of the historical assessment of cardiac risk factors. In phase 2 (interview phase), the percentage of patients who were asked about cocaine use was compared with the percentage of patients with historical documentation of cocaine use. In phase 3 (recall phase), we reported the percentage of patients who recalled being questioned about cocaine use. Comparison of recall with other cardiac risk factors was performed with Fisher exact or χ² tests. All tests were considered significant at a 2-tailed α value of .05.

RESULTS

In phase 1, a total of 133 patients presented to the ED with a chief complaint of chest pain during the study period. Four patients did not have medical records available for review. The remaining 129 patients made up the study group. The mean (±SD) age of the patients was 52.9 ± 16.6 years; 114 patients (88%) were white and 74 (57%) were male. Ninety-four patients were admitted (73%). Seventeen patients (13%) sustained an acute myocardial infarction during this visit.

The presence or absence of questions about cocaine use was documented in at least 1 physician or nursing note in only 13% of the cases, while the presence or absence of other traditional cardiac risk factors was documented more frequently: hypercholesterolemia, 58%; diabetes mellitus, 73%; family history, 77%; hypertension, 82%; and tobacco use, 90%. Cocaine use was less frequently documented than each of the other cardiac risk factors (P < .05 for all comparisons). The presence or absence of documentation for each of the individual physician and nursing notes is shown in the Table. For each individual physician or nursing note, cocaine was the least often documented risk factor.

Eighty-six patients were interviewed after admission to the hospital from the ED in phase 2. These patients had a mean age of 64.7 ± 13.2 years. Eighty (93%) were white and 57 (66%) were male. Fifty-three (62%) of these patients sustained an acute myocardial infarction.
Twenty-seven (31%) stated that they had been questioned about cocaine use at some time after ED arrival. Of these 27 patients, 25 (93%) recalled being questioned in the ED and 10 (37%) had been questioned about cocaine use after admission. Eight patients were questioned in the ED and after admission. A review of the medical records of those patients who stated that they had been questioned about cocaine use found that only 12 (44%) had the presence or absence of cocaine use documented.

In phase 3 (recall phase), we used structured questions in the ED to specifically assess a history of cocaine use, hypertension, and diabetes. Twenty patients were questioned the next day. These patients had a mean age of 51.3 ± 14.2 years. Eighteen patients (90%) were white and 11 patients (55%) were male. Three (15%) sustained an acute myocardial infarction. All 20 patients (100%) recalled being questioned about hypertension and diabetes (95% confidence interval [CI], 85%-100%). Nineteen (95%) recalled being questioned about cocaine (93% CI, 85%-100%). These differences were not statistically significant (P = .36).

### Comment

Over the past 15 years, the use of cocaine has drastically increased in the United States. An estimated 24 million people have used cocaine at least once, and 5 million use it on a regular basis. Cocaine is the most common drug of abuse in patients presenting to EDs, accounting for almost 40% of all drug-related visits. Between 1985 and 1989, EDs experienced a 354% increase in cocaine-related visits. Chest pain accounts for almost 40% of the cocaine-related ED complaints.

The marked increase in recreational cocaine use in the past decade, combined with the recognition that cocaine can induce myocardial ischemia and infarction, has fundamentally altered the treatment of patients with chest pain. Patients who have myocardial ischemia secondary to cocaine use are treated differently from patients who have myocardial ischemia unrelated to cocaine use. Recommendations for the treatment of patients with cocaine-associated myocardial ischemia include early use of benzodiazepines, avoidance of β-antagonists, and more cautious use of thrombolytic agents and lidocaine. In patients with cocaine-associated chest pain, electrocardiograms, clinical history, and laboratory markers of myocardial infarction appear to be less specific for acute infarction.

Because the treatment and diagnosis of a patient with symptoms of acute cardiac ischemia may differ based on whether or not that patient has recently used cocaine, it is important to determine whether individual patients have recently used cocaine. Both the Agency for Health Care Policy and Research and the American College of Emergency Physicians list cocaine as an important historical item to be assessed in patients with chest pain and potential myocardial ischemia. One 4-center study (that included our institution) found that ED physicians significantly underestimated the prevalence of cocaine use at their own institutions. In that study, physicians estimated that 2% to 10% of ED patients with chest pain had recently used cocaine. In fact, 17% of ED patients with chest pain tested positive for cocaine or cocaine metabolites. Twenty-eight percent of patients who tested positive denied cocaine use on physician questioning. The authors of the study recommend objective testing when changes in treatment occur as a result of the presence or absence of recent cocaine use.

In the present study, we found that the presence or absence of cocaine use was poorly documented. Only 13% of patient records had at least 1 physician or nursing note that addressed cocaine use. For each individual physician or nursing note, cocaine was the least often documented risk factor. In contrast, the presence or absence of other traditional cardiac risk factors was documented more frequently. Besides cocaine use, the least commonly documented traditional cardiac risk factor was hypercholesterolemia (58%). Tobacco use was documented in 90% of patient records.

To assess the possibility that chart documentation did not accurately represent the frequency with which patients were questioned about cocaine use, we interviewed patients after admission. Twenty-seven (31%) of 86 patients were questioned about cocaine use during hospitalization, most often while still present in the ED. Of those patients who stated that they had been questioned about cocaine use, only 44% had the presence or absence of cocaine use documented in their medical records. Our data suggest that most patients with chest pain are not questioned about cocaine use, and even when they are, the answer is often not documented.

To assess the possibility that patients were actually asked about cocaine use, but did not recall this ques-

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tioning, we asked structured questions in the ED and interviewed the patients to assess their recall. All 20 patients (100%) recalled being questioned about hypertension and diabetes (95% CI, 85%-100%). Nineteen (95%) of the 20 patients recalled being questioned about cocaine (95% CI, 85%-100%). These data show that recall bias does not account for the results demonstrated above.

We have shown that patients are less frequently asked about cocaine use than about other cardiac risk factors. Even when they are asked about cocaine use, the answer is often not documented in the medical record. Potential reasons why clinicians might not assess recent cocaine use include inexperience, concerns about patient confidentiality, and/or the need to obtain consent to screen patients, failure to understand the role of cocaine in myocardial ischemia, and lack of appreciation that patients from all socioeconomic classes might use cocaine. Education regarding the widespread use of cocaine and its implications in the treatment of patients with myocardial ischemia should be undertaken.

This study has several limitations that merit discussion. We attempted to reduce the limitations of a retrospective record review in the design of phase 1 of our study.60 We had a single trained chart abstractor who was monitored on a sample of charts; the case selection and variables abstracted were explicitly defined; closed-question data collection forms were used; and the chart abstractor and principal investigator met several times a week to resolve abstraction-related queries. However, the chart abstractor was not blinded to study hypothesis. Although we cannot assure that misclassification bias did not exist as a result of the chart abstractor not being blinded to the study hypothesis, phase 2 was a prospective assessment of whether patients were questioned about cocaine use. The interviewer for this phase of the study was different from the chart abstractor, and this interviewer was blinded to the study hypothesis.

It is possible that clinicians are more likely to document the presence of individual cardiac risk factors than the absence of these same risk factors. This is one plausible explanation for the low rate of documentation of cocaine use. However, the other cardiac risk factors were present in only 20% to 56% of the patients who had risk factor assessment documented in the medical records. In addition, our direct patient questioning in phase 2 found that most patients were not questioned about cocaine use.

Finally, this study is limited by the fact that it was conducted at a single institution where ED physicians and cardiology fellows have had extensive education regarding cocaine-associated myocardial ischemia. Physicians in this institution have participated in several clinical studies of patients with cocaine-associated chest pain. As a result, we would have anticipated more attention to cocaine as a cardiac risk factor than might occur at other institutions.

In conclusion, we have shown that patients with chest pain are often not asked about recent cocaine use. When questions about cocaine use are asked, the answers are poorly documented. These findings cannot be explained by poor recall. Efforts to improve the questioning of patients with chest pain about cocaine use are needed, since recent cocaine use may change the treatment, disposition, and need for counseling in such cases.

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REFERENCES