Cocaine-associated chest pain in the emergency department

Weber JE, Shofer FS, Larkin GL, Kalaria AS, Hollander JE. Validation of a brief observation period for patients with cocaine-associated chest pain. *N Engl J Med* 2003;348:510-7.

Background: Through its pharmacologic effect at α- and β-adrenergic receptors, cocaine is thought to increase the oxygen demand of the myocardium by increasing blood pressure and heart rate and to reduce oxygen delivery by producing coronary spasm. Thus, it is not surprising that cocaine use may account for up to 25% of cases of acute myocardial infarction among patients 18 to 45 years of age. For patients who have not recently used cocaine and who present to the emergency department with chest pain but have a low risk for cardiovascular events, 12-hour observation periods have been shown to be a safe and cost-effective alternative to hospital admission. However, no criteria have been identified to date that allow cocaine users who present to the emergency department with chest pain to be safely and rapidly discharged.

Question: Is a 12-hour observation period in a chest-pain observation unit followed by discharge a safe option for patients with cocaine-associated chest discomfort who are at low risk of cardiovascular events ?

Design: From 1998 to 2000, 344 consecutive patients aged 18 years or older who presented to an emergency department with chest pain and who either reported use of cocaine during the week before presentation or tested positive for cocaine were evaluated. Forty-two of these patients were directly admitted to hospital and were excluded from the study because they were at high risk of a cardiovascular event (ischemia or acute myocardial infarction suggested on initial electrocardiogram, elevated serum levels of cardiac markers, recurrent ischemic chest pain or hemodynamic instability). The remaining 302 patients were enrolled in this prospective study. They were monitored for 9 to 12 hours in the emergency department's chest-pain observation unit, then discharged and contacted again at least 30 days later to determine their outcomes.

Results: Patients were typically male (66%), black (70%) and tobacco users (84%); the mean age was 38 years. Cocaine use was self-reported by 247 of the 302 patients; all of the others tested positive for cocaine metabolites in their urine. Of those who reported cocaine use, most (203) had inhaled "crack" cocaine; other routes were nasal insufflation ("snorting") (51), intravenous injection (10) or a combination of methods. Of the 247 who reported cocaine use, 96% (237) said they had used it in the week before presentation and 68% (169) within 24 hours before presentation.

During the 12-hour observation period, ASA and nitrates were given to 93% and 90% of the patients respectively and benzodiazepines to 30%. None was given fibrinolytic agents. Initially, as per the study protocol, all patients underwent stress testing and had a cardiology consultation after 9 hours of observation; later in the study, stress testing became optional. A total of 158 of the 302 patients underwent stress testing before discharge.

Follow-up information was obtained for 300 of the patients. There were no deaths from cardiovascular causes. Four of the patients had had a nonfatal myocardial infarction during the 30-day follow-up period. Two of them had undergone stress testing during the study observation period: one had had an abnormal test result and was found to have nonocclusive disease by means of cardiac catheterization, and the other had had an indeterminate stress test result followed by a normal result on subsequent dipyridamole sestamibi scanning. All 4 had continued to use cocaine during the follow-up period. Of the 42 people who had been directly admitted to hospital and were considered to be at high risk of a cardiovascular event (excluded from the study), 20 received a diagnosis of an acute coronary syndrome.

Commentary: This prospective study, with a defined protocol and almost complete follow-up information, provides good evidence that an observation period of 9 to 12 hours that includes continuous 12-lead ST-segment monitoring, measurement of cardiac troponin I levels, an optional stress test and an obligatory cardiac consultation before discharge is efficient in distinguishing between patients who need to be admitted and those who can be safely discharged with appropriate follow-up.

Practice implications: Because chest pain is a frequent problem among patients using cocaine who present to emergency departments, establishment of a 12-hour observation protocol in emergency departments would provide a safe, cost-effective alternative to hospital admission for cocaine users with chest pain who are at low to intermediate risk of a cardiovascular event.

John Hoey
CMAJ