Cocaine-Associated Chest Pain and Myocardial Infarction

Based on the AHA 2008 Scientific Statement for Management of Cocaine-Associated Chest Pain and Myocardial Infarction

George J. Philippides, M.D., F.A.H.A.
Division of Cardiology
Boston Medical Center
AHA Guideline for Management of Cocaine-associated Chest Pain and Myocardial Infarction

2007 Writing Committee Members

James McCord, MD, Chair

Bojan Cercek, MD, FAHA
James A. de Lemos, MD
Barbara Drew, RN, PhD, FAHA
W. Brian Gibler, MD

Judd E. Hollander, MD
Priscilla Hsue, MD
Kristin Newby, MD, MHS
Magnus Ohman, MD
George Philippides, MD
This slide set was adapted from the AHA 2008 Scientific Statement for the Management of Cocaine-Associated Chest Pain and Myocardial Infarction

Circulation 2008: published online before print March 17, 2008, 10.1161/CIRCULATIONAHA.107.188950.
This scientific statement reflects a consensus of expert opinion following a thorough literature review that consisted of controlled clinical trials, cardiac catheterization laboratory studies, observational studies, case reports, and controlled in-vivo animal experiments.

It is important to note that a few recommendations in this statement differ slightly from those published in the 2007 ACC/AHA NSTE-ACS guidelines. All differences between the two documents are highlighted in this slide set.
Applying Classification of Recommendations and Level of Evidence
<table>
<thead>
<tr>
<th>LEVEL A</th>
<th>LEVEL B</th>
<th>LEVEL C</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Multiple (3-5) population risk strata evaluated</em></td>
<td><em>Limited (2-3) population risk strata evaluated</em></td>
<td><em>Very limited (1-2) population risk strata evaluated</em></td>
</tr>
<tr>
<td>General consistency of direction and magnitude of effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Class I
- Benefit >> Risk
- Procedure/Treatment **SHOULD** be performed/administered

### Class IIa
- Benefit >> Risk
- Additional studies with focused objectives needed
- IT IS REASONABLE to perform procedure/administer treatment

### Class IIb
- Benefit ≥ Risk
- Additional studies with broad objectives needed; additional registry data would be helpful
- Procedure/Treatment **MAY BE CONSIDERED**

### Class III
- Risk ≥ Benefit
- No additional studies needed
- Procedure/Treatment should **NOT** be performed/administered
- Since it is not helpful and may be harmful

**Estimate of Certainty (Precision) of Treatment Effect**

**Suggested phrases for writing recommendations**

- Should
- is recommended
- is indicated
- is useful/effective/beneficial

- Is reasonable
- can be useful/effective/beneficial
- is probably recommended or indicated

- May/might be considered
- may/might be reasonable
- usefulness/effectiveness is unknown/unclear/uncertain or not well established

- Is not recommended
- is not indicated
- should not
- is not useful/effective/beneficial
- may be harmful
AHA 2008
Management of
Cocaine-Associated Chest Pain
and Myocardial Infarction
Epidemiology of Cocaine Use in the United States

• Cocaine use is common
  – Cocaine is the most commonly used illicit drug in the U.S. after marijuana
  – 14% of people age 12 or older (34 million) have tried cocaine at least once
  – 1.5 million (0.6%) Americans abused cocaine in 2002-3

• Cocaine related ED visits are common
  – Drug Abuse Warning Network reported 448,000 cocaine-related ED visits in 2005
  – Cocaine related ED visits have increased by 47% from 1999-2002
  – Most frequent age group is 35-44 years
Pathophysiology

- **Acute effects**
  - Coronary artery vasoconstriction
  - Thrombus formation
  - Increased myocardial oxygen demand

- **Chronic effects (long term use)**
  - Left ventricular hypertrophy
  - Premature atherosclerosis
Clinical Presentation

- Cardiopulmonary symptoms predominate (56%) and include:
  - Chest pain, most frequent symptom
  - Dyspnea
  - Diaphoresis
  - Palpitations
  - Dizziness
  - Nausea
  - Anxiety

Aortic Dissection and “Crack Lung Syndrome” should be considered
Clinical Characteristics in the Typical Patient With Cocaine-Induced Chest Pain

- Young age, usually less than 40 years
- Mostly males: 57-84%
- Smokers: 84-91%
- Few other traditional cardiac risk factors
- Cocaine use within preceding 24 hours: 88%

Mittleman. *Circulation.* 1999;(21)2737
Prevalence of Cocaine Use in Patients with Chest Pain

- 359 unselected chest pain patients presenting to ED
- Urine Immunoassay for cocaine:
  - Municipal Hospitals 14-25% +
  - Suburbuan Hospitals 7% +

Incidence of AMI

ED studies report an overall incidence of cocaine associated MI of 0.7-6% after cocaine ingestion.
Complications of Cocaine-associated MI

- Cocaine-associated MI study
  - Retrospective study of 130 patients
  - 38% had cardiac complications
    - Heart Failure 7%
    - Arrhythmias 43%
      - Bradyarrhythmia 20%
      - VT 18%
      - SVT 5%
  - 90% of events occurred within 12 hours of presentation
  - In-hospital mortality rate of 0%

Hollander et al. Am J Cardiol. 2007;99:822
Diagnostic Strategies

• Clinical
  – History/Self-reported use of cocaine
  – Immunoassay for cocaine metabolites
• Electrocardiography
• Cardiac Biomarkers
• Echocardiography
• Coronary Angiography
• Evaluation in a Chest Pain Unit
Therapeutic Strategies: Overview

- Patients with cocaine-associated ACS should be treated similarly to those with traditional ACS with a few notable exceptions.

- There are no randomized, placebo-controlled trials regarding therapies to improve outcomes in patients with cocaine-associated MI.

- Recommendations are based primarily on animal studies, cardiac catheterization laboratory studies, observational studies and case reports.
Treatment Recommendations

- Establish intravenous access
- Continuous EKG monitoring
- Oxygen
- Benzodiazepines (IB)
- Aspirin
- Nitroglycerin (IB)
- Phentolamine (IIb/C)
- Calcium channel blockers (IIb/C)
- PCI rather than fibrinolytics, when possible
Intravenous benzodiazepines have beneficial neuropsychiatric and hemodynamic effects, can relieve chest pain, and should be administered in the acute setting. 

New recommendation

ACC/AHA NSTEMI Guidelines
Benzodiazepines No recommendation
Nitrates

Nitroglycerin reverses cocaine associated vasoconstriction and relieves chest pain. Patients with ongoing ischemic discomfort should receive sublingual NTG (0.4mg) every 5 minutes for a total of 3 doses then intravenous NTG should be considered.

New recommendation

ACC/AHA NSTEMI Guidelines
Phentolamine

Phentolamine reduces coronary vascular resistance and blood pressure in patients after cocaine ingestion
Phentolamine may be considered in patients with ongoing ischemic discomfort unresponsive to nitroglycerin or calcium channel blocker therapy

ACC/AHA NSTEMI Guidelines  No recommendation
Calcium Channel Blockers should not be used as a first-line treatment but may be considered for patients with ongoing ischemic discomfort unresponsive to benzodiazepines and nitroglycerin.

New recommendation

ACC/AHA NSTEMI Guidelines
Beta-Blockers: Early Therapy

Beta-blockers increase blood pressure and enhance cocaine induced coronary vasospasm

All Beta-blockers, including those with alpha-adrenergic antagonist activity (labetalol, carvedilol) should be avoided in the acute setting
Labetalol

Combined alpha-and beta blocking agents do not appear to offer any advantages over traditional beta-adrenergic antagonists. Labetalol increases the risk of death in animal models and does not reverse coronary artery vasoconstriction in humans. Labetalol is not recommended in the acute setting

New recommendation

ACC/AHA NSTEMI Guidelines
Beta-Blockers: Long Term Therapy

Chronic Beta-blocker use should be considered only for those who are at low risk for recurrent use of cocaine and have strong indications:

- Documented MI
- LV systolic dysfunction
- Ventricular Arrhythmias

The decision should be individualized based on risk/benefit assessment and patient counseling.
Cocaine-associated Chest Pain

ASA
Benzodiazepines

IV NTG, Nitroprusside for persistent Hypertension
(alternative: Phentolamine)

High Risk
STEMI
Primary PCI

Low-moderate Risk
NSTE ACS
Cardiac Catheterization

Avoid B-blockers acutely
Antithrombotic and Antiplatelet therapy
(as indicated by existing guidelines)

Discharge Therapy
ASA, clopidogrel, Statin, ACE I (as indicated by existing guidelines)
Consider B-blockers especially if high risk features (systolic dysfunction, dysrhythmia)
Drug Abuse Counseling

Observe in CPU
Drug Abuse Counseling
Stress Test Optional
Inpatient or Outpatient
Cocaine Induced Chest Pain

The full-text guideline is also available on the American Heart Association Web site:

www.american-heart.org

http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.107.188950

© 2008, American Heart Association. All rights reserved.