Stimulant Poisoning or Overdose

Aliases

Stimulant, cocaine, methamphetamine, amphetamines, PCP, phencyclidine, bath salts

Patient Care Goals

1. Identify intoxicating agent.
2. Protect organs at risk for injury such as heart, brain, liver, kidney.
3. Determine if there is an antidote.
4. Treat the symptoms which may include severe tachycardia and hypertension, agitation, hallucinations, chest pain, seizure, and arrhythmia.

Patient Presentation

Inclusion Criteria

1. Tachycardia or tachydysrhythmias
2. Hypertension
3. Diaphoresis
4. Delusions or paranoia
5. Seizures
6. Hyperthermia
7. Mydriasis (dilated pupils)
8. Stimulant or hallucinogenic (with stimulant properties) agents:
    a. Cocaine
    b. Amphetamine or methamphetamine
    c. Phencyclidine (PCP) (hallucinogen)
    d. Bupropion
    e. Synthetic stimulant drugs of abuse (some having mixed properties)
    f. Ecstasy
    g. Methamphetamine
    h. Synthetic cathinones (bath salts)
    i. Spice
    j. K2
    k. Synthetic THC
    l. Khat

Exclusion Criteria

No recommendations

Patient Management

Assessment

1. Begin with the ABCDs:
    a. Airway is patent
    b. Breathing is oxygenating
    c. Circulation is perfusing
    d. Mental status is stable
2. Treat any compromise of these parameters.
3. Ask about chest pain and difficulty breathing.
4. Check vital signs including temperature for hyperthermia.
5. Apply a ECG cardiac monitor
6. Check blood glucose level.
7. Monitor $ETCO_2$ for respiratory decompensation.
8. Check a 12-lead ECG when possible.

9. Check for trauma, self-inflicted injury.
10. Check for weapons and drugs (law enforcement should have already performed this check, but you may decide to repeat the inspection).

Treatment and Interventions

1. Establish IV access for any fluids and meds ***[AEMT].***
2. Consider isotonic IV/IO fluid bolus 20 ml/kg ***[AEMT]*** [see Shock and Hyperthermia/Heat Exposure guidelines].
3. Treat chest pain as ACS and follow STEMI protocol if there is ECG is consistent with STEMI.
4. Consider treating shortness of breath as atypical ACS.
    a. Administer oxygen as appropriate for dyspnea or distress with a target of achieving greater than 93% saturation for most acutely ill patients.
5. Consider soft physical management devices especially if law enforcement has been involved in getting patient to cooperate [see Agitated or Violent Patient/Behavioral Emergency guideline].
6. Consider medications to reduce agitation and other significant sympathomimetic findings for the safety of the patients and providers. This may improve behavior and compliance [see Agitated or Violent Patient/Behavioral Emergency guideline].
7. Consider prophylactic use of anti-emetic **Ondansetron** ***[PARA]***
    a. Adult: 4mg IV/IM/IO/PO/ODT; every 5-15 min prn X 3
    b. Pediatric: 0.15mg/kg IV/IM/IO/PO/ODT (max dose of 4mg); every 5-15 min prn X 3
8. If hyperthermia suspected, begin external cooling.

Patient Safety Considerations

- Apply the least amount of physical management devices that are necessary to protect the patient and the providers [see Agitated or Violent Patient/Behavioral Emergency guideline].
- Assess for potential weapons or additional drugs; this is very important since these items can pose a threat not just to the patient but also to the EMS crew.

Notes and Educational Pearls Key Considerations

- Recognition and treatment of hyperthermia (including sedatives to decrease heat production from muscular activity) is essential as many deaths are attributable to hyperthermia.
- If law enforcement has placed the patient in handcuffs, this patient needs ongoing physical security for safe transport. Have law enforcement in back of ambulance for the handcuffed patient or make sure proper physical management devices are in place before law enforcement leaves and ambulance departs from scene.
- If patient has signs and symptoms of ACS, strive to give nitroglycerin.
    - Vasospasm is often the problem in this case as opposed to a fixed coronary artery lesion.
    - Consider administration of benzodiazepines as if to treat anxiety.
- Maintaining IV access, ECG cardiac monitor, and SPO_2/$ETCO_2$ monitors are key to being able to catch and intervene decompensations in a timely manner.
- If agitated, consider restraining the patient to facilitate patient assessment and lessen likelihood of vascular access or monitor displacements.
- Cocaine has sodium channel blocking effects and can cause significant cardiac conduction abnormalities with a widened QRS. Treatment is with sodium bicarbonate similar to a tricyclic antidepressant. Check a 12-lead EC to assess for these complications.

Pertinent Assessment Findings

- History is as important as the physical examination.
- If the patient is on psychiatric medication, but has failed to be compliant, this fact alone puts the patient at higher risk for excited delirium.
- If the patient is found naked, this may elevate the suspicion for stimulant use or abuse and increase the risk for excited delirium. Neuroleptic malignant syndrome, serotonin syndrome and excited delirium can present in with similar signs and symptoms.

- If polypharmacy is suspected, hypertension and tachycardia are expected hemodynamic findings secondary to increased dopamine release. Stimulus reduction from benzodiazepines, anti-psychotics, and ketamine will improve patient's vital signs and behavior.
- Be prepared for the potential of cardiovascular collapse as well as respiratory arrest.
- If a vasopressor is needed, epinephrine or norepinephrine is recommended over dopamine.

Quality Improvement

Associated NEMSIS Protocol(s) (eProtocol.01)

- 9914225—Medical-Stimulant Poisoning/Overdose

Key Documentation Elements

- Reason for psychologic and physical management procedures used and neurologic or circulatory exams with device use
- Reason for medications selected
- Documentation of QT interval when antiemetic medications, haloperidol, or droperidol is used and result conveyed to ED staff

Performance Measures

- Recognition and treatment of hyperthermia
- Recognition of need for monitoring cardiovascular and respiratory status of patient with stimulant toxicity
- ACS evaluation and treatment considered for chest pain and shortness of breath
- Quick recognition and treatment of respiratory compromise
- Quick recognition and treatment of cardiovascular compromise
- Outcome that patient and medics did not suffer any harm
- Outcome that access and monitoring were not lost during transport

References

1. Warrcik BJ, Hill M, Hekman K, et al. A 9-state analysis of designer stimulant, "bath salt," hospital visits reported to poison control centers. *Ann Emerg Med.* 2013;62(3):244-51.
2. *White Paper Report on Excited Delirium Syndrome.* ACEP Excited Delirium Task Force, American College of Emergency Physicians; September 10, 2009.