The Use of Intravenous Lipid Emulsion Therapy in Acute Methamphetamine Toxicity
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Learning Objectives

- Examine symptoms and treatment modalities for acute sympathomimetic toxicity
- Review the mechanism of action of lipid emulsion therapy
- Discuss the utilization of lipid emulsion therapy in acute methamphetamine intoxication

ED Evaluation

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- EKG: sinus tachycardia, no ischemic changes
- Chest x-ray: unremarkable
- CT Head: unremarkable
- Urine tox: (+) amphetamines/cannabinoids
- Blood tox: (-) acetaminophen or salicylate

Discussion

- Symptoms of acute methamphetamine toxicity resemble a sympathomimetic toxidrome
- Intravenous lipid emulsion therapy should be considered as an alternative treatment modality in severe cases of methamphetamine toxicity
- Rapid improvement after lipid emulsion therapy may preclude the need for intubation or critical care admission

Patient Presentation

55 year old Caucasian male
- Brought in by police after deliberate ingestion of an “egg-sized” amount of methamphetamine
- Denies any concomitant alcohol, tobacco, or drugs
- No complaints noted upon arrival

Physical Exam
- Constitutional: tremulous and agitated
- Skin: diaphoretic and warm
- Neurologic: alert and oriented, follows commands, moves all extremities spontaneously

ED Course
- Becomes increasingly confused and diaphoretic refractory to intravenous fluids, cooling measures, and escalating doses of benzodiazepines
- Consultation obtained with ED pharmacist and medical toxicologist
- Initiation of intravenous lipid emulsion therapy with 100 mL bolus of Intralipid 20%
- Normalization of vital signs noted shortly after commencement of lipid emulsion therapy
- Intubation and intensive care unit (ICU) admission deferred given clinical improvement
- Discharged home after uneventful 5 day hospital stay

Background

- Methamphetamine is a synthetic, lipophilic sympathomimetic amine
- Symptoms of acute toxicity: chest pain, palpitations, dyspnea, seizures, psychosis, autonomic instability
- Lipid emulsion therapy gaining traction as an alternative therapy for acute lipophilic drug intoxications
- MOA: infusion of a lipid emulsion leads to repartitioning of drugs from an aqueous plasma phase into a lipid phase following a concentration gradient

References

5. Weinberg GL, Velleda-Boncouer T, Ramirez-A, Garcia-Amaro MF, Cukl MJ. Pretreatment or resuscitation with a lipid infusion shifts the dose-response to bupivacaine-induced asystole in rats. Anesthesiology. 1998; 88:1071-S