

Mississippi Toxicology Bulletin

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SPECIAL POINTS OF INTEREST:

- Methamphetamine in Mississippi
- Chloroquine in the News
- Case Report: Surviving Meth Overdose

Meth 2.0 in Mississippi

Methamphetamine is a popular illegal drug currently second only to marijuana in Mississippi. A recent drug bust in Harrison County netted 114 pounds of methamphetamine estimated at more than \$1 million. "Meth 2.0" is a monicker for high-purity methamphetamine. Currently, the purity of methamphetamine crossing into the USA is so high (>90%) that it is often found in sheets rather than granules. Methamphetamine is a potent stimulant that increases neurotransmitter concentrations in the central nervous system. Tolerance develops quickly due to the euphoria it produces. Abusers may go on "runs" in which they use the drug dozens of times without sleeping for days. Long-term abuse can result in memory loss, psychosis, weight loss and severe dental problems ("meth mouth"). Methamphetamine abuse is most often observed in unemployed single males between 20-35 years of age. Toxic effects include agitation, delirium, tachycardia, hyperthermia, rhabdomyolysis and cardiac collapse. Screening tests for methamphetamine are available in nearly every hospital, but these are not sensitive to the synthetic designer amphetamines currently available. Methamphetamine and designer amphetamines (MDPV, butylone, 25I-NBOMe and others) are easily identified at the University of Mississippi Medical Center during targeted mass spectrometry analysis.

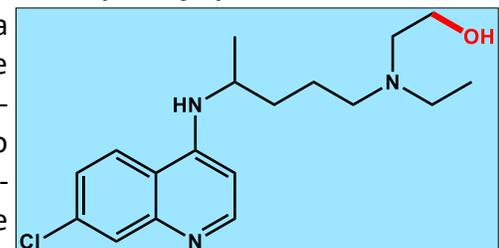


Methamphetamine 'rocks' stored as evidence at the Mississippi Forensics Laboratory.

Chloroquine in the News

The Centers for Disease Control recently issued a public health alert about the potential for severe illness and/or death from the use of non-pharmaceutical chloroquine phosphate after two individuals became critically ill - one of whom died - after ingesting the substance. The husband and wife ingested unknown amounts of non-pharmaceutical-grade chloroquine phosphate, believing that it would provide protection from COVID-19 infection. The product they consumed was (Continued)

by: Vijay Kumar M.D.



Structures of Chloroquine (black) and Hydroxychloroquine (with red font)

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Technologists are
always on call for
Emergencies

Chloroquine in the News (continued)

in powder form in a 2.2-pound container labelled "For Ornamental Fish Use Only." Chloroquine products sold for aquarium use have not been evaluated by the FDA for safety, effectiveness or quality control. Although the FDA has issued an emergency authorization for the use of chloroquine and hydroxychloroquine in patients with COVID-19, the substances should not be consumed unless prescribed by a licensed health care provider. Chloroquine and hydroxychloroquine are quinolone antibiotic derivatives often used as antimalarial, antiparasitic and immunosuppressant drugs. Chloroquine has a narrow therapeutic index (low margin of safety) with toxic blood concentrations only slightly higher than therapeutic concentrations. Toxicities at high doses may include nausea, vomiting, hypokalemia, hallucinations, seizures, cardiac conduction disturbances and cardiac failure. Chloroquine and hydroxychloroquine are excreted largely through urine and are easily detected by targeted mass spectrometry analysis (GC-MS or LC-MS).

Case Report

Surviving Methamphetamine Overdose by: Hansini Laharwani M.D.

An 18-year-old male was transported to the emergency department after developing altered mental status. The patient had initially been arrested and, per his family, had ingested an "8 ball" (1/8 ounce) of drugs to evade detection by police. Upon arrival, he exhibited altered mental status, tachycardia (138 bpm) and hyperthermia (107 degrees Fahrenheit). Aggressive cooling was initiated and four liters of IV fluids were administered. The patient was intubated and sedated with lorazepam and ziprasidone. The patient developed metabolic lactic acidosis with minimal urine output. STAT toxicology testing included a positive amphetamine screen and positive GC-MS for amphetamine and methamphetamine.

The patient was transferred to the Medical Intensive Care Unit due to hemodynamic instability and persistent tachycardia. His creatinine kinase rose to 1,100 (reference 40-170) and urine was reddish-brown, both indications of rhabdomyolysis. His liver enzymes, AST and ALT, increased to 3,743 U/L (reference 0-40) and 4,180 U/L (reference 1-41) respectively. After aggressive hydration with IV fluids and sodium bicarbonate, his CK began to trend downwards. Intravenous N-acetyl-L-cysteine was administered to manage hepatotoxicity. After 5 days the patient was extubated, at which time he exhibited tremors and sweating from methamphetamine withdrawal. The patient was discharged on the 8th day with instructions to drink at least 2.5 liters of water a day due to kidney injury.

Discussion

The amphetamines are some of the most widely abused drugs due to their stimulatory, euphoric, and addictive effects. Clinical features of toxicity include agitation, delirium, seizures, hyperthermia, hypertension, tachycardia, and cardiac arrhythmias. Death from overdose typically occurs from cardiac arrhythmias, intracerebral hemorrhage and/or hyperthermia. Laboratory screens for amphetamine and methamphetamine provide Positive or Negative results for the amphetamine class and do not identify the exact drug. Mass Spectrometry (GC-MS or LC-MS) is required for positive identification and can be ordered as needed for suspected ingestion, drug abuse, or legal/forensic analysis.

The Mississippi Toxicology Bulletin is a semiannual newsletter published by the Analytical Toxicology Laboratory at the University of Mississippi Medical Center. Articles, reports or case studies for publication may be submitted to Dr. Patrick Kyle at pkyle@umc.edu.