

## CASE REPORT

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# Case Report: Distribution of Methamphetamine in a Massive Fatal Ingestion

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**ABSTRACT:** A subject who apparently swallowed a baggie containing "crank" (methamphetamine) while being arrested, was admitted to hospital and then experienced a massive overdose of the drug. The subject went through a seizure with associated fixed dilated pupils, and a depressed pulse and blood pressure. His cardiac and respiratory problems could not be stabilized, and he died. Methamphetamine levels in central and peripheral blood, liver, bile, vitreous, gastric and urine were determined. Blood levels of greater than 60 mg/L, were found together with even higher levels in the bile, urine and gastric. These levels are discussed in terms of other fatal, non-fatal and recreational methamphetamine use.

**KEYWORDS:** forensic science, forensic toxicology, substance abuse, methamphetamine, intoxication, overdose, driving while intoxicated

### Case Report

A 27-year-old white male with a history of two recent drug overdoses, involving heroin and cocaine respectively, was reported acting suspiciously, and attempting to break into a parked car. Police were dispatched and arrested the subject who admitted he had earlier used 1-1 $\frac{1}{4}$  grams of "crank" (methamphetamine). He appeared disoriented, and felt unwell. Emergency medical technicians were summoned, and he was transported to a local hospital. He appeared somnolent, tremulous, and would not follow commands. His pupils were mid-sized and reactive to light, and he had a pulse of 139. Shortly after admission he had a seizure, with a variety of cardiac and respiratory problems, his pulse dropped below 20, blood pressure dropped sharply, and his pupils became fixed and dilated. Attempts to stabilize him failed and he died shortly afterwards, five hours after being arrested. The only significant finding at autopsy was moderate congestion and abundant edema throughout the lungs.

An officer later stated she thought he had swallowed a "baggie"

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containing drugs when she and another officer initially arrived at the scene, although the amount was not known.

Drug analysis was initially performed on the peripheral blood and urine. Urine was positive for amphetamines and benzodiazepines by Enzyme Multiplied Immunoassay (EMIT, Syva, CA), and positive for methadone and methamphetamine by thin layer chromatography (Toxi Lab). Confirmatory analysis was performed by gas chromatography and gas chromatography/mass spectrometry, on an extract obtained using a modified n-butyl chloride extraction (1). A drug screen of the peripheral postmortem blood revealed a massive overdose of methamphetamine, and the tissue distribution in other tissues was determined. The data is presented in Table 1. The drug was fairly evenly distributed throughout the body in this case, with significantly elevated levels in the gastric, bile and urine. Diazepam, administered therapeutically, and methadone were also present at concentrations of 0.08 mg/L, and 0.15 mg/L respectively in the peripheral blood. Both were present in the therapeutic range.

This represents the highest methamphetamine overdose with which we are familiar. Tissue drug levels are comparable with those reported for cocaine in "body packer" deaths (2). The case was remarkable from the perspective that progressive onset of the events leading to death were closely monitored and documented. The initial presentation was most likely associated with a "crash" from prior admitted methamphetamine use (3). During observation for this condition, it is likely that the baggie presumed swallowed during arrest, became ruptured, and subsequently lost in emesis, accounting for the fact that it was not present in the stomach at autopsy. The patient's condition deteriorated through seizure and arrhythmia, to death, associated with marked pulmonary congestion and edema.

TABLE 1—Tissue distribution of methamphetamine and amphetamine (mg/L).

	Methamphetamine	Amphetamine
Peripheral blood	53.7	0.43
Central blood	65.7	0.70
Urine	375.6	5.06
Bile	353.7	3.29
Gastric†	514.3	3.46
Liver*	90.9	0.88
Vitreous	45.8	0.64

NOTE—† gastric volume, 200 mL

\*liver concentration in mg/Kg

In a similar but non-fatal case, a subject stopped for a tail light violation swallowed a bag containing methamphetamine. Shortly after being contacted by the officer, he complained his heart "was going to explode," and his pupils were widely dilated. He was disoriented, agitated, non-compliant and became violent when detained. He was subdued and transported to a local hospital where his stomach was pumped. He experienced some arrhythmia, and a mild seizure, but recovered uneventfully with supportive therapy. The methamphetamine level in his blood, drawn on admission to hospital about an hour after arrest was 9.46 mg/L, the amphetamine level was 0.35 mg/L. The amount of drug ingested was not known.

Methamphetamine levels in fatalities following intravenous administration have been as high as 0.8 mg/L, and levels up to 13 mg/L in other fatalities have been reported (4). Methamphetamine levels in recreational users of 0.15–0.56 mg/L have been associated with violent and irrational behavior (5). We have encountered methamphetamine levels as high as 2.58 mg/L in a driver involved in a single vehicle accident. In drivers arrested on suspicion of driving while intoxicated who tested positive for methamphetamine, the mean blood drug level was 0.49 mg/L ( $n = 29$ ). Smith (6) reported a similar case of ingestion of methamphetamine during an arrest, and noted a temperature of 108°F, with an irregular pulse of 102. The subject later died, and was found to have a blood and liver methamphetamine concentrations of 22 mg/L and 137 mg/g respectively. In a case of death following the ingestion of 1.5 g of methamphetamine (7), the subject was found to have a rectal temperature of 101.1°F, 3 to 4 hours after death. The blood and liver methamphetamine concentrations were 43 mg/L, and 75.4 mg/Kg respectively. Similarly Baselt (8) noted blood and liver concentrations of 40 mg/L and 206 mg/Kg respectively in a case where a subject swallowed methamphetamine when approached by police.

The very high levels found in this case are consistent with massive oral ingestion, and the circumstances suggested that the death was an accident, resulting from the subject swallowing approximately 1–2 g of methamphetamine.

The practice of swallowing methamphetamine to avoid detection of possession of the drug appears to be a relatively common, and commonly fatal, course of events.

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