



### **K19 An Internet-Directed Hydrogen Sulfide Suicide: Fast Fatality in Northeast Ohio**

*Kathleen Toomey\*, 5267 Hickory Drive, Lyndhurst, OH; Eric S. Lavins, BS, 11001 Cedar Avenue, Cleveland, OH 44106; Andrea L. Wiens, DO, 850 High Street, Middletown, IN 47356; John F. Wyman, PhD, Cuyahoga Co Regional Forensic, Toxicology Section, 11001 Cedar Avenue, Cleveland, OH 44106; Michael G. Schaedler, BS, 11001 Cedar Avenue, Cleveland, OH 44106; and Thomas P. Gilson, MD, Cuyahoga Co MEO, 11001 Cedar Avenue, Cleveland, OH 44106*

---

After attending this presentation, attendees will better understand poisoning by hydrogen sulfide as a suicide method.

This presentation will impact the forensic science community by informing forensic professionals about: (1) a novel suicide technique found on the internet used particularly by our youth; (2) concerns for first responders; (3) unique pathology findings; and, (4) providing a discussion of toxicology results of this substance.

Suicide from internet-directed hydrogen sulfide (H<sub>2</sub>S) asphyxiation has been seen in the United States since August 2008, following a trend observed in Japan earlier that year. Instructions posted on the internet include which cleaners and pesticides to buy, how to mix these commercially available chemicals to create the gas, and on some sites, a note to print out that cautions first responders to the presence of H<sub>2</sub>S gas.

Hydrogen sulfide is poisonous primarily in the gaseous form, which is characterized by a “rotten egg smell” at low concentrations. Continued exposure to H<sub>2</sub>S results in desensitization of the olfactory senses so that it is no longer detected. Normal healthy subjects have thiosulfate levels of less than 0.3mg/L. Sulfide in the body is partially converted to sulfate and thiosulfate through oxidization. Baselt recommends that thiosulfate levels should be assessed to establish fatal intoxications. H<sub>2</sub>S inhibits cellular respiration by binding with the iron of cytochrome oxidase, in the same fashion as hydrogen cyanide, thereby inhibiting binding of oxygen and stopping cellular respiration, resulting in death.

A 26-year-old White male was found in his car with a note taped to the window reading “Stay away! poisonous [sic] chemicals! call [sic] 911”. Also in the car were a bucket, bottles of toilet bowl cleaner and lime sulfur spray, and two other notes, both indicating that H<sub>2</sub>S gas had been formed. A reading of 8 parts per million H<sub>2</sub>S gas was taken by responding authorities. HAZMAT removed a 5-gallon bucket with liquid that was located in the front passenger seat and quickly made it neutral. Suicide notes were found addressed to his family.

A complete forensic autopsy was performed at the Cuyahoga County Medical Examiner’s Office (CCMEO), Cleveland, Ohio. It consisted of an external and internal examination of the body, microscopic examination, and toxicological examination. Samples of heart and femoral blood, vitreous humor, gastric contents, bile, urine, and liver were submitted for comprehensive toxicological examination.

The body was that of a normally developed 26-year-old adult White man with a length of 64 inches (5’4”) and a weight of 157 pounds. External examination was significant for distinct gray/green discoloration of the face, lips, conjunctivae, abdomen, hands, and feet. Internal examination revealed mild, generalized brain edema with diffuse green discoloration of the cortex and deep gray structures. There was marked dark green discoloration of the substantia nigra, red nuclei, and cerebellar dentate nucleus. The cerebral and cerebellar white matter was unremarkable. Visceral organs appeared normal grossly. Microscopic examination revealed diffuse brain and visceral congestion with focal perivascular acute necrosis in the brain, evidence of acute microscopic cardiac ischemia, and hemorrhagic pulmonary edema.

Toxicological testing revealed ethanol 0.02g/dL, caffeine, and cotinine in the femoral blood. Heart blood was sent to AIT Laboratories in Indianapolis, Indiana, for a comprehensive drug screen and to National Medical Services (NMS) Labs in Willow Grove, Pennsylvania, for thiosulfate analysis. AIT Laboratories found the femoral blood positive for alprazolam 14.3ng/mL and caffeine. NMS Labs reported 43mg/L thiosulfate in the decedent’s femoral blood, which is 143 times higher than the thiosulfate level of a healthy subject.

The autopsy findings in this case were consistent with the suspicion that death was due to acute exposure to H<sub>2</sub>S. The cause of death was determined to be asphyxia due to hydrogen sulfide inhalation. The manner of death was ruled as suicide.

---

#### **Hydrogen Sulfide, Suicide, Internet**