



Pathology Biology Section - 2012

G38 Man With a Blue Brain: A Case of Hydrogen Sulfide Poisoning

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The goal of this presentation is to illustrate an unusual case of suicide within a closed vehicle by mixing household chemicals to form hydrogen sulfide gas.

This presentation will impact the forensic science community by illustrating an unusual case of suicide that results in a hazardous materials (Hazmat) situation for first responders and medical examiner personnel.

Introduction: Suicide is one of the most important public health issues and represents the eleventh leading cause of death in the United States. Suicides comprise approximately 12% of the caseload of the Allegheny County Medical Examiner's Office in Pittsburgh, Pennsylvania. Suicide rates for this country have been relatively stable over the past decade averaging approximately 10 per 100,000 populations. The most common method of suicide in the United States is the use of a firearm.

Chemical suicides have plagued the United States since 2008, and continue to be on the rise. This method of suicide originated in Japan in 2007, where they have seen over 2,000 such cases. Chemical suicide, or detergent suicide, involves mixing common household chemicals to create deadly hydrogen sulfide (H₂S) gas, which is lethal in contained areas. Hydrogen sulfide, H₂S, is a colorless gas that has a strong odor of rotten eggs or sulfur. H₂S inhibits enzymes in mitochondria by binding with Fe³⁺ of cytochrome oxidase. This reaction blocks cellular respiration, and interferes with oxygen utilization at the cellular level.

Materials and Methods: The case involved a 32-year-old Caucasian male with a history of a recent suicide attempt via sleeping pills. The decedent was recently depressed over losing his job and the threat of his car being repossessed. He was last seen alive the previous night.

The decedent was located by his father the next evening in his car in the rear of a large parking lot. The father recognized that his son was unresponsive and smashed the car window to gain access to his son. He then drug his son partially out of the car before being overcome by noxious fumes. First responders arrived at the scene and pronounced the son dead. His father was evaluated by medics and taken to a local hospital for observation.

There was a note taped to the driver's side window of the car stating "Danger! Hydrogen sulfide gas! Call police! Stay away!" There was a large size plastic container in the back seat of the car containing a blue liquid.

Results: The body was decontaminated at the scene by local fire department and Hazmat crews by dousing with water.

The external examination revealed a Caucasian male that had a blue-gray hue to his skin color and wet clothing. There were areas of skin slippage to his trunk and extremities. There were no detectable noxious smells or gases detected with a Hazmat CAD device. The autopsy revealed bilateral congested lungs and white froth in the airways. Upon removal of the skull cap, a rotten egg smell was observed and the brain was blue.

The household chemicals used to produce the hydrogen sulfide gas were lime sulfur spray (containing the active ingredient calcium polysulfide) and a strong chlorine acid.

Conclusions: Responders must do a thorough scene safety check before attending to a vehicle with unresponsive patients. Responders should take extra time to peer into the vehicle and look for buckets or other mixing containers in the front or rear seats, containers of acids and pesticides, a yellow or green residue in the vehicle, and vents that may be taped off. Responders need to be extremely cautious when investigating suspicious odor calls inside a structure. Once recovered from the vehicle, the body should be thoroughly washed with water and transported in a body bag to the morgue. During the autopsy, decedents may off-gas from their lungs and in this case their brain.

Hydrogen Sulfide Gas, Hazmat, Suicide