G107 Death in a Tanker Truck

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After attending this presentation, attendees will understand the need for thorough investigation of work-related fatalities and will be familiar with the autopsy presentation of death by inhalation of caustic substances.

This presentation will impact the forensic community by suggesting strategies for investigating occupational deaths by using interagency communication and cooperation.

In this case, a 23-year-old man was cleaning the inside of a tanker truck which had been used to carry 50% potassium hydroxide. The procedure for cleaning the tank included a confined space entry procedure, consisting of 21 pages of instructions.

The cleaner used spray head to flush the tank with water at least four times, then used a fan to dry the tank. The tank would be checked for adequate oxygen concentration using a digital meter. A worker would then go into the tank, using a safety harness, mask, ladder, personal air monitor, personal motion detector, and protective equipment. A second worker, acting as the safety attendant, remained outside the tank. Ventilation was introduced by using an air hose inserted into a small hatch in the tank. The worker would remove any remaining chemical using a high-pressure water hose, hand dry the tank, and inspect it for corrosion. During the cleaning procedure, the truck engine was off.

On the day this case occurred, the decedent was working alone. Fifteen minutes after he entered the tank, another worker checked on him and found him unresponsive at the bottom of the tank. He was removed from the tank using his safety harness, and taken to a hospital, where he was pronounced dead.

Autopsy showed pulmonary edema, and pulmonary and gastric hemorrhage. Toxicology was negative except for vitreous urea nitrogen of 30 mg/dL.

The supervising Coroner's investigator and Chief Medical Examiner-Coroner visited the scene and discussed the procedures used for cleaning the tank with employees of the transportation company. In addition, Coroner's staff met with the involved police agency and representatives of California Department of Industrial Relations, Division of Occupational Safety and Health. The Material Safety Data Sheet for potassium hydroxide and the medical literature provided additional information.

The cause of death was determined to be pulmonary edema due to potassium hydroxide exposure and other undetermined factors. Dehydration was given as a contributing condition.

The medical literature contains reports of chronic obstructive lung disease following sodium hydroxide inhalation. However, rapid death after potassium hydroxide inhalation has not been reported. The mechanism of death proposed for this case is that the caustic potassium hydroxide produced widespread pulmonary edema, with rapid degradation of respiratory function. The exothermic reaction of potassium hydroxide and water may have contributed to death by heating the inside of the tank.

Given the non-specific autopsy and toxicology findings, additional investigation was essential in determining the cause of death for this decedent. Through cooperation between the Coroner, law enforcement, and occupational health agencies, the cause of death could be established in this case.

Occupational Health, Potassium Hydroxide, Inhalation

 ** Presenting Author*