G51 The Happy Land Homicides: 87 Deaths Due to Smoke Inhalation

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After attending this presentation, the participant will understand the roles of carbon monoxide, cyanide, ethanol, and hydrochloric acid in fatal smoke inhalation.

On March 25, 1990, eighty-seven people died of smoke inhalation at the "Happy Land Social Club" in New York City. A 36-year-old man, who earlier had been ejected from the unlicensed club after a verbal altercation with his former girlfriend who worked at the club entrance, intentionally started the fire. He went to a nearby service station, filled a plastic container with a dollar's worth of gasoline, and returned to the club. He threw the gasoline and lit matches into the only entrance of the two story social club. Smoke quickly filled the club. Although the fire was extinguished within minutes, all but five of the occupants of the building were found dead within the building.

Within 36 hours the New York City Office of Chief Medical Examiner performed 87 autopsies on this group of healthy, young people, all of whom quickly died from smoke inhalation from a common fire source. All decedents were visually identified and all had soot in the airway extending to the major bronchi. Only 30% of the decedents had thermal injuries and most were partial thickness burns involving less than 20% body surface area.

Carboxyhemoglobin (COHb) concentrations ranged from 37% to 93% with a mean of 76.5%. The vast majority (92%) of the decedents had COHb concentrations over 60%. Ethanol was detected in 72% of decedents with a range of 0.01 to 0.29 g% and a mean blood concentration of 0.11 g%. Of the 24 decedents with no ethanol detected at autopsy, the average COHb concentration was 79%. The 15 decedents with blood ethanol concentrations of 0.15 g% or higher had an average COHb concentration of 73%. Cyanide concentrations ranged from 0 to
5.5 mg/L with a mean of 2.2 mg/L. Nine decedents had no cyanide detected and seven had cyanide concentrations of less than 1 mg/L. The tracheal pH ranged from 5 to 7 (mean 6.4).

Since all decedents in this instance died from smoke inhalation in the same smoke filled environment, if cyanide was a reliable indicator of smoke inhalation, then all the decedents would have detectable cyanide. The fact that nine of the decedents had no cyanide detected and another 7 had less than 1 mg/L demonstrate that cyanide did not play any role in several deaths. In fire deaths, cyanide concentrations do not provide helpful, interpretable information and need not be performed on suspected smoke inhalation deaths. Alcohol does not appear to cause death at a lower COHb concentration as the mean COHb concentrations in the intoxicated (BAC >0.14g%) and sober groups were similar (73% vs. 79%). Hydrogen chloride inhalation, as judged by comparison of the pH of tracheal mucosa to controls, was not a factor. The cause of all deaths was smoke inhalation and the manner was homicide.

Forensic Science, Carbon Monoxide, Smoke Inhalation

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