K69 Infant and Toddler Deaths Associated With Potent Opioid Exposure

Robert Hargrove, BS, North Carolina Office of the Chief Medical Examiner, Raleigh, NC; Sandra C. Bishop-Freeman, PhD*, North Carolina Office of the Chief Medical Examiner, Raleigh, NC 27607; Ruth E. Winecker, PhD, RTI International, Raleigh, NC*

Learning Overview: After attending this presentation, attendees will understand the dangers of potent medications as they relate to infants, toddlers, and young children. Case studies from the state of North Carolina will demonstrate what substances can harm an infant or child with environmental exposure—one swallow or pill.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by increasing awareness of the impact of the opioid epidemic on infants and toddlers and by educating forensic investigators, pathologists, and postmortem toxicologists.

While most ingestions of household products are benign, there are a handful of substances in which one pill or a small dose of medication will be sufficient to cause death in a small child, toddler, or infant. This concept is even more alarming with the modern-day opioid epidemic, which was initially fueled by generous prescribing habits and later gave rise to potent illicit fentanyl analogues. Unlike a typical adult ingestion for purposes of self-harm or pleasure, pediatric poisonings are usually the result of curiosity, exploration, a decreased or lack of sense of danger, or imitation of adults and older sibling behavior.

Due to body composition and size of an infant or toddler compared to an adult, it's not surprising to see that what may not cause death in an adult can easily cause a small child to succumb. Ingestions of a single dose of prescription medication can produce elevated concentrations in postmortem blood that may be confused with an intake of multiple doses. Without careful consideration and thorough investigations, these rulings may be considered intentional homicidal poisonings instead of accidental poisonings. Cases involving oxycodone, liquid methadone, and fentanyl will be discussed in detail. The popularity of highly potent opioids makes modern-day illicit substances far more dangerous to children. North Carolina has seen two cases of fentanyl analogue poisoning that have been certified as means of poisoning with undetermined manner by the pathologists.

Age/Sex	Weight	Toxicology	Select History
3 years/F	15 kg	Vena Cava Blood - 0.44mg/L Methadone Liver- 1.9mg/kg	A red substance was left in a food container in reach of the child, later confirmed to be methadone prescribed to the mother.
9 months/F	8.7 kg	Central Blood- 6-AM Present, 6.3ng/mL Acetyl Fentanyl, 23ng/mL Fentanyl	Infant was seen alive at 9:30 a.m. and found unresponsive at 2:25 p.m. A small piece of folded paper was recovered from gastric contents and was positive for 6-Acetylmorphine (6-AM) acetyl fentanyl, fentanyl, and morphine.

Multiple opioid case studies in toddlers and infants will be explained in detail to show incidents in which, after a thorough investigation, it was concluded that a child was exposed to a small amount of illicit substance or pharmaceutical preparation.

Pediatric Poisoning Deaths, Postmortem, Forensic Toxicology