



K74 Case Report: Two Child Fatalities Due to Heroin/Fentanyl Exposure

Rebecca T. DeRienz, MS*, 6034 Jamesport Drive, Westerville, OH 43081; Daniel Baker*, 520 King Avenue, Columbus, OH 43201; Rachel M. Barnett, BCJ, 1949 Rea Avenue, Columbus, OH 43223; Jennifer M. Hogue, MS, 22250 Reed Road, Marysville, OH 43040; Nancy E. Kelly, 520 King Avenue, Columbus, OH 43201; John A. Daniels, MD, 520 King Avenue, Columbus, OH 43201; and Anahi Ortiz, Franklin County Coroner Office, 520 King Avenue, Columbus, OH 43201

After attending this presentation, attendees will better understand the successful toxicological investigation of two unrelated cases involving children that suffered unexpected lethal heroin/fentanyl exposures.

This presentation will impact the forensic science community by sharing postmortem findings of two cases, thereby advantageously making additional reference information available. This presentation will also communicate the need for the forensic toxicologists to routinely screen for fentanyl regardless of initial case circumstances and further investigate depressed immunoassay results in light of other analytical findings.

Drug user environments have the potential to inadvertently affect innocent bystanders through all possible routes of exposure. Lethal intoxications of children in these environments do not appear to occur often and, therefore, published knowledge of these cases is sparse.

This case report presents two postmortem cases of unrelated children found to have heroin and fentanyl in their systems. Although heroin and fentanyl separately and in combination across the country have been a well-documented nationwide problem, the cases presented here represent the youngest heroin/fentanyl intoxications published to date. Both cases were not originally investigated as suspicious and were anticipated to be natural or accidental in nature. The first case involves an 11-month-old male found unresponsive at his residence with no suspicion of foul play. The second case concerns a 14-month-old female initially reported to be found unresponsive in her car seat after eating soft candies. Upon scene response, Case 1 appeared to be an unsafe sleeping situation or potential Sudden Unexplained Infant Death (SUID) while Case 2 seemed to be an accidental choking on food. Toxicology screening was performed by **Enzyme-Linked Immuno-Sorbent Assay (ELISA)** in whole blood, demonstrating a presumptive positive fentanyl result for Case 1 and a presumptive positive opiate and fentanyl result for Case 2. Urine, if available, was screened by Gas Chromatography/Mass Spectrometry (GC/MS) in full scan mode after Solid Phase Extraction (SPE). Quantitative opiate confirmation of 6-monoacetylmorphine (6-MAM) and morphine was achieved in blood and gastric contents for each case using SPE and GC/MS in selected ion monitoring mode. Additionally, diacetylmorphine (heroin) was analyzed qualitatively in gastric contents by GC/MS in full scan mode. Quantitative analysis of fentanyl and norfentanyl in blood and gastric contents was achieved by SPE and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) equipped with an Electrospray Ionization (ESI) source and operated in positive ionization mode. Analytical findings are summarized in Table 1.

After the toxicology results were reported, follow-up investigation with witnesses by the local police department revealed heroin use in the home related to Case 1. The high levels of fentanyl and 6-MAM along with the presence of diacetylmorphine in the gastric of Case 1 suggests the child consumed heroin and fentanyl orally. The police investigation from Case 2 revealed that the child was taken inside a known drug house prior to becoming unresponsive. The circumstances surrounding the second child's exposure to heroin are undetermined at this time.

Table 1: Toxicology Results

	ELISA Screen Results in Whole Blood	Compound of Interest	Source		
			Heart Blood Result (ng/mL)	Gastric (ng/mL) (Total Recovered = ~100mL)	Urine Result
CASE#1	FENANYL (POS) 33% b/b0	Fentanyl	14	1143	POS
		Norfentanyl	1.6	Not Detected	POS
	OPIATES (ND) (Depressed Result) 34% b/b0	Diacetylmorphine	Not Detected	POS	Not Detected
		6MAM	Not Detected	523	Not Detected
		Morphine	Trace (between 5-20)	50	POS



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	ELISA Screen Results in Whole Blood	Compound of Interest	Thoracic Blood (ng/mL)	Gastric (ng/mL) (Total Recovered = ~2mL)
CASE #2	FENANYL (POS) 17% b/b0	Fentanyl	20	101
		Norfentanyl	Not Detected	Not Detected
	OPIATES (POS) 6.5% b/b0	Diacetylmorphine	Not Detected	Not Detected
		6MAM	Trace (<i>between 2.5-10</i>)	163
		Morphine	106	86

Heroin, Fentanyl, Pediatric