



K45 Tissue Distribution of Drug Intoxication in Pediatric Fatalities

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After attending this presentation, attendees will have learned about the tissue distribution of lidocaine in a pediatric fatality as well as the tissue distribution of methadone in four pediatric fatalities.

This presentation will impact the forensic community and/or humanity by demonstrating the importance of obtaining multiple tissue samples for analysis in pediatric fatalities involving drugs as well as the need for co-operation between pathology staff and the toxicology laboratory.

Lidocaine is a local anesthetic. Case history and toxicological findings from one pediatric fatality due to lidocaine intoxication is presented. Methadone is an analgesic. Case histories and toxicological findings from four pediatric fatalities are presented.

In the first case, a two year-old black female complained about a sore in the mouth, was taken by her mother to a clinic. The subject was given a prescription for lidocaine and was found unresponsive two days later. The subject was transported to the hospital and expired on the following day. Lidocaine was detected in a basic drug screening and quantitated by Gas Chromatography, after solvent-solvent extraction with internal standard methodology. The presence of lidocaine was confirmed with full scan Gas Chromatography/Mass Spectrometry. The tissue distribution of lidocaine for the first case was as follows: blood, 2.52 mg/L; bile, 1.98 mg/L; liver, 0.76mg/kg; brain, 0.52 mg/kg; spleen, 7.20 mg/kg; and kidney, 2.68 mg/kg. The cause of death was bronchopneumonia due to lidocaine intoxication due to herpes stomatitis. The manner of death was listed as accident.

In the second case, an eighteen month-old black male drank a glass of orange juice with methadone on an end table and was found unresponsive later. The subject was hospitalized and died five days later. Methadone was detected in a basic drug screening and quantitated by Gas Chromatography, after solvent-solvent extraction with internal standard methodology. The presence of methadone was confirmed with full scan Gas Chromatography/Mass Spectrometry. The tissue distribution of methadone for the second case was as follows: blood, 0.10 mg/L; hospital blood (clotted, day two), 0.10 mg/kg; liver, 0.23 mg/kg; and brain, 0.23 mg/kg. The cause of death was methadone intoxication. The manner of death was listed as undetermined.

In the third case, a two year-old black male was found choking and gasping for air while in the bed. The subject was hospitalized and expired three days later. The tissue distribution of methadone for the third case was as follows: blood, negative; bile, 0.36 mg/L; and liver, 0.26 mg/kg. The cause of death was methadone intoxication. The manner of death was listed as undetermined.

In the fourth case, a five year-old black female began to choke and went into convulsions in the presence of her grandmother early morning. The subject died in the emergency room. On the day before, the subject might have drunk some of the orange juice with methadone, while riding with her mother and one of her mother's friends in her mother's car. The tissue distribution of methadone for the fourth case was as follows: blood, 0.64 mg/L; urine, 3.31 mg/L; bile, 2.18 mg/L; liver, 2.22 mg/kg; brain, 0.82 mg/kg; and spleen, 3.58 mg/kg. The cause of death was methadone intoxication, with parental neglect as a contributing factor. The manner of death was listed as undetermined.

In the fifth case, a fourteen year-old black male was playing in a football game for his high school and later on that night, was complaining to his parents of having a headache. Four days later, the subject was vomiting, so his parents told him to stay home from school. The subject was found unresponsive in bed when his father returned home from work. The tissue distribution of methadone for the fifth case was as follows: blood, 0.35 mg/L; liver, 2.70 mg/kg; spleen, 1.08 mg/kg; and kidney, 1.48 mg/kg. The cause of death was methadone intoxication. The manner of death was listed as accident.

In these pediatric fatalities, multiple tissue specimens were submitted to the toxicology laboratory when the pathologist requested testing. In the event, that a positive finding occurred, in one specimen from the case, the toxicology staff was then able to analyze multiple tissue specimens in order to provide a tissue distribution study. In pediatric fatalities, a positive finding of a drug usually implied that someone other than the deceased child/infant was involved with the administration of the drug in question. A tissue distribution study performed in this type of case will provide the toxicology findings as an unequivocal litigation package. Toxicologists are only able to do tissue distribution studies in cases such as these, with the full support of the pathology staff.

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