

K50 Over the Counter (OTC) Drugs Encountered in a Large Population of Postmortem Pediatric Cases

Jennifer L. Turri Swatek, MS*, Newnan, GA 30265; Michael E. Lamb, MSFS, NMS Labs, Horsham, PA 19044

Learning Overview: After attending this presentation, attendees will have insight into pediatric exposure to OTC medications in the postmortem population.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating that commonly available medications are susceptible to misuse, and special consideration needs to be given when assessing toxicological findings in the pediatric population.

In forensic toxicology, the pediatric population requires special focus when evaluating positive findings. In particular, administration of OTC drugs needs careful consideration because of the many toxicokinetic and toxicodynamic differences (e.g., metabolic capabilities, body size, etc.) between pediatric and adult populations. Due to these differences, dosages given to the pediatric population (0 days–19 years), particularly those less than five years of age, tend to be lower than that of an older population. This presentation provides insight into pediatric exposure to OTC medications in the postmortem population.

Postmortem pediatric data from a nine-and-one-half-year period (January 2010–July 2020) were compiled. A total of 2,123 positive cases contained one or more of the following common OTC medications: antihistamines (brompheniramine, chlorpheniramine, diphenhydramine, doxylamine, and pheniramine); pain relievers (acetaminophen, naproxen, ibuprofen, and salicylate); cold/flu medications (dextro/levomethorphan, guaifenesin, ephedrine, and pseudoephedrine); Gastrointestinal (GI) aids (dicyclomine and loperamide); and sleep aids (melatonin).

	Antihistamines	Pain Relievers	Cold/Flu Medications	GI Aids	Sleep Aids
Neonate (N); ≤28 Days	37	26	15	1	0
Infant (I); 29 days - <1 year	93	115	57	3	4
Toddler (TD); 1 - 3 years	126	122	45	6	5
Pre-School (PS); 4 - 5 years	25	26	17	0	2
School Age (SA); 6 - 12 years	72	63	38	4	2
Teens (TN); 13 - 19 years	521	294	286	18	0
Totals	874	646	458	32	13

Table 1: Number of positive cases of common OTC medications in the postmortem pediatric population.

Antihistamines, cold/flu medications, and pain relievers are the most common classes of drugs encountered in the postmortem pediatric population. When considering the data, it must be noted that many of these drugs may be co-administered in the form of one medication containing multiple drugs or multiple drugs being used in conjunction with one another. In addition, some drugs may have a variety of uses (e.g., antihistamines used as sleep aids). Of note, a trend can be seen where the infant and toddler age groups have a higher number of positive cases, followed by a dip, then a large increase in the teen population. These infant and toddler populations represent a group that relies on medication administration from a more mature figure. As dosages are often lower for the younger population, incorrect handling of medications by the individual administering the drug(s) may result in unintentional overdoses. The older, teenaged population represents a group that is capable of self-administering OTC medication. With the widespread availability of OTC medications, intentional recreational abuse (e.g., dextromethorphan and loperamide) and suicidal overdoses are more prevalent in this population. Case examples demonstrating use of OTC medications in the pediatric population will be discussed.

Overall, this presentation demonstrates that commonly available medications are susceptible to misuse, and special consideration needs to be given when assessing toxicological findings in the pediatric population.

Pediatric, OTC Drugs, Postmortem