K8 Incidence of Fetal Drug Exposure in Alabama: 2004-2011

Jack R. Kalin, PhD, Alabama Department of Forensic Sciences, 2026 Valleydale Road, Hoover, AL 35244-2095*

After attending this presentation, attendees will learn the incidence of fetal drug exposure in Alabama from 2004 through June of 2011 and by extension, the extent of maternal drug use proximate to the delivery of stillborn fetuses and/or newborn infants.

This presentation will impact the forensic science community by pointing out how maternal drug use during pregnancy manifests in fetal drug exposure and represents a significant public health problem. This presentation describes toxicological findings in specimens collected from stillborn fetuses and newborn infants as a measure of the extent of drug exposure in utero and, by extension, of maternal drug use proximate to delivery. In some instances, maternal blood was also available for analysis and findings were compared to the stillborn fetuses. This differs from the more common practice of conducting toxicological examinations with meconium.

The Alabama Department of Forensic Sciences (ADFS) provides forensic laboratory services to the law enforcement community in Alabama (pop. 4.66 million), which includes approximately 600 state, county and local police, sheriff departments, district attorneys, coroners, and medical examiners. Laboratory records from cases submitted to ADFS were reviewed for instances of fetal demise, regardless of cause, for the period 2004 through June of 2011. Cases were selected where blood and/or tissue specimens were available for toxicological examination, the purpose being to identify instances of in utero drug exposure. Thirty-two cases were identified statewide, excluding Jefferson County (pop. 700,000).

Toxicological examinations included headspace analyses for ethanol and related volatiles, immunoassays for common drugs of abuse and both liquid-liquid and solid-phase extractions followed by analysis with GC/MS and/or LC/MS/MS. Where significant, quantitative analyses were conducted.

Twenty-one cases were positive for one or more drugs and/or metabolites; autopsies were conducted in 18 of 21. Five full-term live births were followed by death due to drowning, asphyxiation (2x), acute drug intoxication (within minutes), and/or delayed drug intoxication while in the hospital (after 24 hours). One case involved fetal death due to the mother sustaining blunt-force injuries in a traffic incident.

Six drugs and/or metabolites were identified in one case; four were identified in two cases and one – three were identified in the remainder. Cocaine and/or benzoylecgonine (BE) were the most prevalent substances identified followed by methamphetamine and amphetamine. Levamisole, a common adulterant present in street cocaine, was identified in some cases where cocaine was present. In one case, cocaine and/or metabolites, methamphetamine, and amphetamine were all identified. A summary of drug incidence is provided herein. This presentation will include toxicological findings, causes, and manners of death, and body weights for each individual case.

Analyte	Incidence	Analyte	Incidence
Cocaine/metabolites	10	Chlordiazepoxide	1
Methamphetamine/amphetamine	6	Chlorpheniramine	1
Levamisole	3	Clonazepam/7-aminoclonazepam	1
Citalopram/Escitalopram/Desmethyl-	2	Etomidate	1
Dextromethorphan	2	Meperidine	1
Diazepam/nordiazepam	2	Meprobamate	1
Diphenhydramine	2	Methadone/EDDP	1
Hydrocodone	2	Oxycodone	1
Lidocaine	2	Promethazine	1
Acetaminophen	1	Pseudoephedrine	1
Bupivacaine	1		

In two cases, maternal blood was also available for examination. Results are provided herein.

CaseNo(s)	Fetal Blood	Maternal Blood
******101/102	Methamphetamine, 650 ng/mL Amphetamine, 250 ng/mL	Methamphetamine, 220 ng/mL Amphetamine, 100 ng/mL
******680/048	Acetaminophen Cocaine, 210 ng/mL Benzoylecgonine, 480 ng/mL Levamisole	Cocaine, 65 ng/mL, <10 ng/mL (+24h) Benzoylecgonine, 1700 ng/mL, 59 ng/mL (+24h) Methylecgonine Meperidine Normeperidine

Fetal Drugs, Drugs *in Utero*, Drugs During Pregnancy

Copyright 2012 by the AAFS. Unless stated otherwise, noncommercial *photocopying* of editorial published in this periodical is permitted by AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by AAFS. ** Presenting Author*