QUARTERLY NEWS
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SUBSTANCE ABUSE BY PREGNANT WOMEN AND ITS EFFECTS ON THEIR BABIES

by Charles Plate, PhD.

The 2009 National Survey on Drug Use and Health (SAMHSA, DHHS) reports that 4.5% of pregnant women aged 15-44 years reported recent use of illicit drugs (e.g. marijuana cocaine, heroin, nonmedical use of prescription drugs, etc.). Binge or heavy drinking in the first trimester was reported by 11.9% and 15.3% reported using tobacco products. In the United States the number of infants suffering withdrawal symptoms post birth rose from 7653 in 1995 to 11,937 in 2008. Adjusting for differences in number of births in these years, this represents an increase of 0.1%.

While exposure of neonates to certain drugs can cause such long term effects as impairment of normal neurodevelopment and fetal growth restriction, a more near term effect of neonatal drug exposure is neonatal withdrawal. Depending on the drug used by the mother neonatal withdrawal can be manifested by hyperactivity, crying, tremors and seizures (alcohol); diarrhea, restlessness, vomiting, disturbed sleep (barbiturates); hypothermia, tremors, vomiting, hyperactivity (diazepam).[1] In order to care for a newborn exhibiting one or more of these symptoms, physicians must know to which drug or drugs the newborn has been exposed. Two suggested ways of determining this, having relatively low false-negative results, is screening the newborn's meconium and/or umbilical cord tissue.[1]

United States Drug Testing Laboratories, Inc. (USDTL) was the first laboratory to introduce meconium testing to the market in 1991 (MecStat®) and introduced umbilical cord testing (CordStat®) to the market in 2008. Both tests offer 5, 7, 9, 12, and 13 panels of the most commonly abused illicit and prescription drugs. Both MecStat® and CordStat® also can be used to detect *in utero* exposure of the neonate to alcohol. By knowing what drug or drugs are present in the meconium or umbilical cord sample of a neonate exhibiting withdrawal symptoms, the physician treating the baby can now tailor his or her treatment regime to facilitate early recovery.

Mothers, whose infants exhibit neonatal withdrawal symptoms, may want to breast feed their child. Clearly, before they can do this, they must be drug free and their breast milk must be drug free. To determine that breast milk is drug free and safe for infant, USDTL offers LactoStat℠ with 5, 7, 9, and 12 panels to test samples of breast milk. With LactoStat℠ drug-free results hospital staff can be assured that breast feeding is a viable option.

1) Hudak, M. L., R. C. Tan, THE COMMITTEE ON DRUGS and THE COMMITTEE ON FETUS AND NEWBORN. 2012. Pediatrics http://pediatrics.aappublications.org/content/early/2012/01/25/peds.2011-3212

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NIAAA Advances Research on Fetal Alcohol Spectrum Disorders

NIAA SPECTRUM Feb 2012 Vol 4 Issue 1

In 1967, when French pediatrician Paul Lemoine first recognized that children with alcoholic mothers shared a pattern of abnormal facial features and behavior problems, he did not get much attention. Back then, conventional wisdom held there was nothing wrong with drinking during pregnancy.

But today we know differently.

That's in part because, in 1973, pediatrician David Smith and researcher Kenneth Lyons Jones uncovered the same relationship that Dr. Lemoine did. Dr. Smith hoped to bring more attention to the problematic pattern by giving it a name: fetal alcohol syndrome (FAS).

The name worked, garnering more attention to FAS. Today, we have a much better understanding of the wide range of brain damage and developmental, cognitive, and behavioral problems caused by fetal alcohol exposure.

Research on this range of problems, which we now call fetal alcohol spectrum disorders (FASD), is a top priority for NIAAA. With our support, FASD research has already come a long way.

"Initially, some people thought that this problem only affected neglected children of poor alcoholic women who grew up in unfavorable postnatal environments—and that's why the kids did not look or behave like normal children. But NIAAA-funded critical animal research studies that showed that alcohol is able to disturb the growth and development of an embryo or fetus," explained Sally Anderson, Ph.D., NIAAA.

Today, NIAAA supports researchers around the world who are making tremendous strides. In particular, current research is advancing more accurate diagnoses of FASD, distinguishing FASD from other disorders, and determining the prevalence of FASD with greater precision.

Accurate Diagnosis

Smith and Jones' original description of FAS has not changed very much. People with the following three features receive a diagnosis of full FAS:

- Characteristic pattern of facial abnormalities;
- Growth deficits, either prenatally or postnatally; and
- Central nervous system dysfunction.

But fetal alcohol exposure does not always result in all three characteristics, meaning that some people would not receive an FAS diagnosis although they were adversely affected.

"Initially, clinicians were only able to identify individuals with FAS," explained Kenneth Warren, Ph.D., acting director of NIAAA, and a leading expert on FAS and FASD.

"If you didn't have the distinctive facial features, you weren't diagnosed with FAS. If you didn't have a growth deficit, you weren't diagnosed with FAS. Fortunately, our ability to understand and describe other areas has been enhanced and continues to improve," Dr. Warren said.

We now include a broader range of effects that result from prenatal alcohol exposure under the umbrella term of FASD. In addition to full FAS, FASD includes:

- Partial FAS, which describes people with some signs and symptoms of full FAS, but not all three.
- Alcohol-related birth defects, which include prenatal alcohol-induced physical abnormalities which affect vision, hearing, or the heart, kidneys, or skeletal structure.
- Alcohol-related neurodevelopmental disorder (ARND), which describes fetal alcohol-induced impairments to the growth and development of the brain or central nervous system, and/or the cognitive and behavioral problems of FAS without facial or growth abnormalities.

Distinguishing FASD From Other Disorders

Treating FASD effectively depends on an accurate diagnosis. Unfortunately, FASD are chronically underdiagnosed. The problem is that "Distinguishing FASD from other developmental disorders is tricky, and evolving diagnostic standards are not yet accepted by everyone," explains Dr. Anderson.

Often, people with FASD are mistakenly diagnosed with conditions like attention deficit hyperactivity disorder (ADHD), which also causes learning and behavior problems.

Current research is making the differences between FASD and other disorders like ADHD much clearer. For example, we now understand the difference in a behavior called perseveration.

"Perseveration is an impaired ability to shift from one task to another. Many people with ADHD often switch from task to task constantly, but if you ask someone within the FASD spectrum to switch from one

activity to another very quickly, they will likely be very resistant," explains Dr. Warren.

A recent review of research studies comparing children with FASD to children with ADHD concluded that children with ADHD have a harder time focusing and sustaining attention while children with FASD have a harder time shifting attention from one task to another and solving problems with flexibility. In addition, children with ADHD have trouble retrieving information they learn verbally. By contrast, children with FASD have trouble encoding and remembering verbally learned information. Other research suggests that stimulant medication, which often reduces inattention symptoms in children with ADHD, is not effective for children with FASD.

Prevalence

We know that FASD are the most common, preventable developmental disorders in the United States. Now, NIAAA is funding a new research study that will improve our knowledge of just how many people are affected by FASD.

NIAAA is developing a network and infrastructure called Collaboration on FASD Prevalence (CoFASP) to test kindergarten and first-grade students for signs of FASD. Testing will begin with students in San Diego, California; Great Falls, Montana; Sioux Falls, North Dakota; and several communities in North Carolina.

"The new study will help determine the prevalence of FAS, partial FAS, and ARND, and also help the children in those communities get the special education services they need to thrive," said Dr. Warren.

Other Areas of Research

Clearly, research has come a long way since Dr. Lemoine's days. Yet Dr. Warren acknowledges there is still a lot we do not yet fully understand. The breadth of research continues to grow.

Other areas of significant NIAAA-funded research on FASD include demonstrating structural brain damage caused by prenatal alcohol exposure using advanced imaging, mitigating the extent of alcohol-related brain damage through nutrition, and understanding the effect of prenatal alcohol exposure on gene expression.

"Of course, our hope is that there will be a day when people no longer have FASD. But until that time, we will continue to try to understand these disorders as best we can. The more we know, the more we can improve the lives of individuals who struggle with these difficulties every day," said Dr. Warren. ♦

Health Buzz: Meth Babies More Prone to Behavior Problems

By Angela Haupt
HealthNews

March 19, 2012
Pregnant Moms' Meth Uses Causes Behavior Problems

Children whose mothers used methamphetamine during pregnancy are more likely to suffer from behavioral problems like anxiety, depression, and moodiness. That's according to a study published today in Pediatrics that tracked the babies of meth-using moms starting at birth and continuing through age 5. Children exposed to meth in the womb have an increased risk of anxiety and depression by age 3, and by age 5, they're more likely to "act out" behaviorally. Government data suggest more than 10 million Americans have used meth, a stimulant like crack cocaine. Previous research hints that meth babies are similar to "crack babies"—smaller in size and more likely to suffer from drowsiness and stress. The results of the latest study are "very worrisome," study author Linda LaGasse of Brown University's Center of the Study of Children at Risk told the Associated Press.

Ask a USDTL Toxicologist:

Q:

- What is the stability of drug and alcohol markers in an umbilical cord specimen after it has been collected? We are collecting cord tissue for all births and storing the specimens until a test is ordered. How long can we store it and still get a reliable result?

A:

- Our in-house validation studies demonstrated that drug and alcohol markers were stable for at least seven days at room temperature, three weeks in the refrigerator (2-8° C), and for 1 year in the freezer (<- 10° C). Furthermore, the validation studies showed that drug and alcohol markers were stable for three freeze-thaw cycles.

Do you have a question for USDTL?

You can ask us by e-mailing your questions to nancy.parra@usdtl.com. Your question may be featured in our newsletter or on our blog at www.usdtlblog.blogspot.com.

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Up Coming Events:

1) April 19-21	National Advanced Practice Neonatal Nursing Conference	New Orleans, LA	Booth 202
2) April 20-23	Mednax	Orlando, FL	
3) April 28-May 1	PAS Expo	Boston, MA	
4) May 9-12	The National Association of Perinatal Social Workers	Little Rock, AR	
5) May 23-25	Nationwide Children's Neonatal Conference	Columbus, OH	
6) May 30-June 2	15th Annual Neonatal Advanced Practice Nursing Forum	Washington, DC	
7) June 23-27	AWHONN	Washington, DC	Booth 527

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