

Fetal Alcohol Spectrum Disorder (FASD)

Emotional and Learning Costs

Susan Buttross, M.D., FAAP
Chief, Division of Developmental and Behavioral Pediatrics
University of Mississippi Medical Center
Jackson, Mississippi 39219
sbuttross@ped.umsmed.edu

Why Should We Be Concerned?

- Babies all deserve a fair start in life.
- Tobacco, alcohol and cocaine use during pregnancy automatically puts that newborn at a disadvantage.
- The problems the children encounter can range from subtle issues to severe and profound problems.

This is our Goal



National Institute on Drug Abuse NIDA National Pregnancy and Health Survey

1992/1993 Nationwide survey to determine
the extent of drug abuse among pregnant
women in the U.S.

Estimating the Prevalence of Fetal Alcohol Syndrome: A Summary
Philip A. May, Ph. D. , and J. Phillip Gossage, Ph. D.

- *the available literature points to a prevalence rate of FAS of 0.5 to 2 cases per 1,000 births in the United States during the 1980s and 1990s.*

NIDA Survey

Results:

- Of 4 million women who gave birth in that period during pregnancy....
 - 757,000 women used alcohol.
 - 820,000 smoked cigarettes.
 - 221,000 used illegal drugs in that year with cocaine and marijuana being the most common.
45,000 of those used cocaine.
 - 32% of those who used drugs also smoked tobacco and used alcohol.

NIDA Results

- Generally rates of use were higher in:
 - Unmarried
 - Those without a college education
 - Non working
 - Those relying on a public form of funding to pay for their hospital stay

Alcohol During Pregnancy



It Takes Us Awhile to Understand

“Behold, thou shalt conceive and bear a son: and now drink no wine or strong drink”. (Judges 13:7)

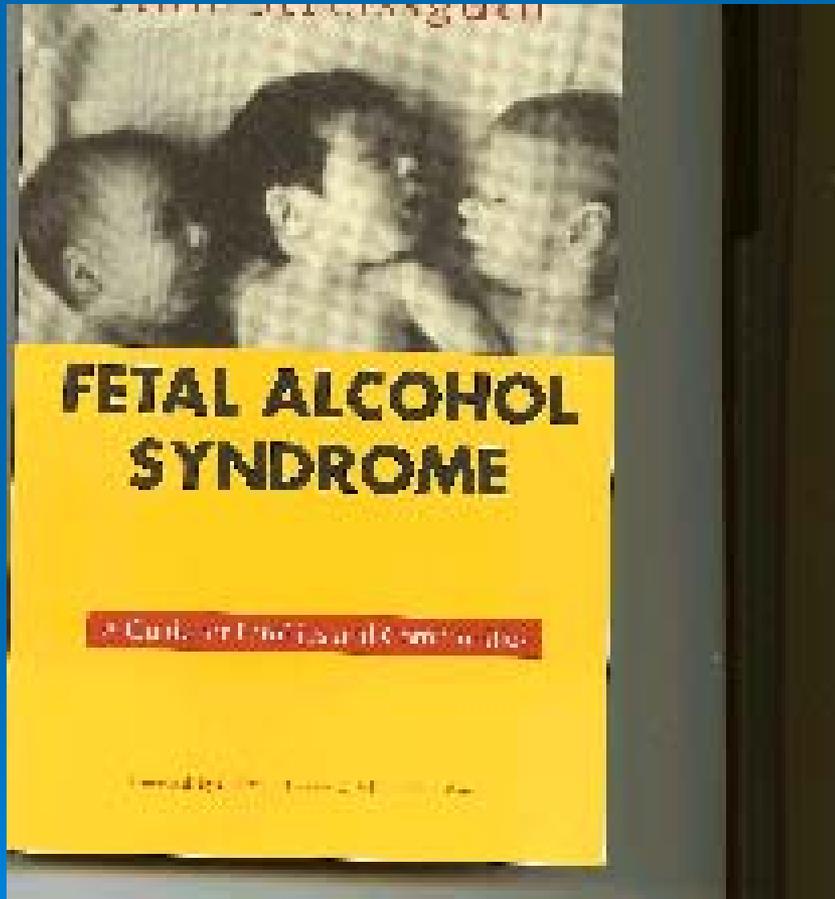
“A ritual that forbade the drinking of wine by the bridal couple so that a defective child would not be conceived”. (Ancient Carthage)

“Infants born to alcoholic mothers sometimes had a starved, shriveled, and imperfect look”. (British House of Commons, 1834)

Fetal Alcohol Syndrome

- First recognized by Lemoine of Nantes, France in 1968
 - He presented his results at a national meeting in France and was literally booed off the stage.
- Later independently discovered by Jones and Smith in 1973.
 - They studied 8 related children all born with this disorder, all who had mothers who were chronic severe alcoholics.

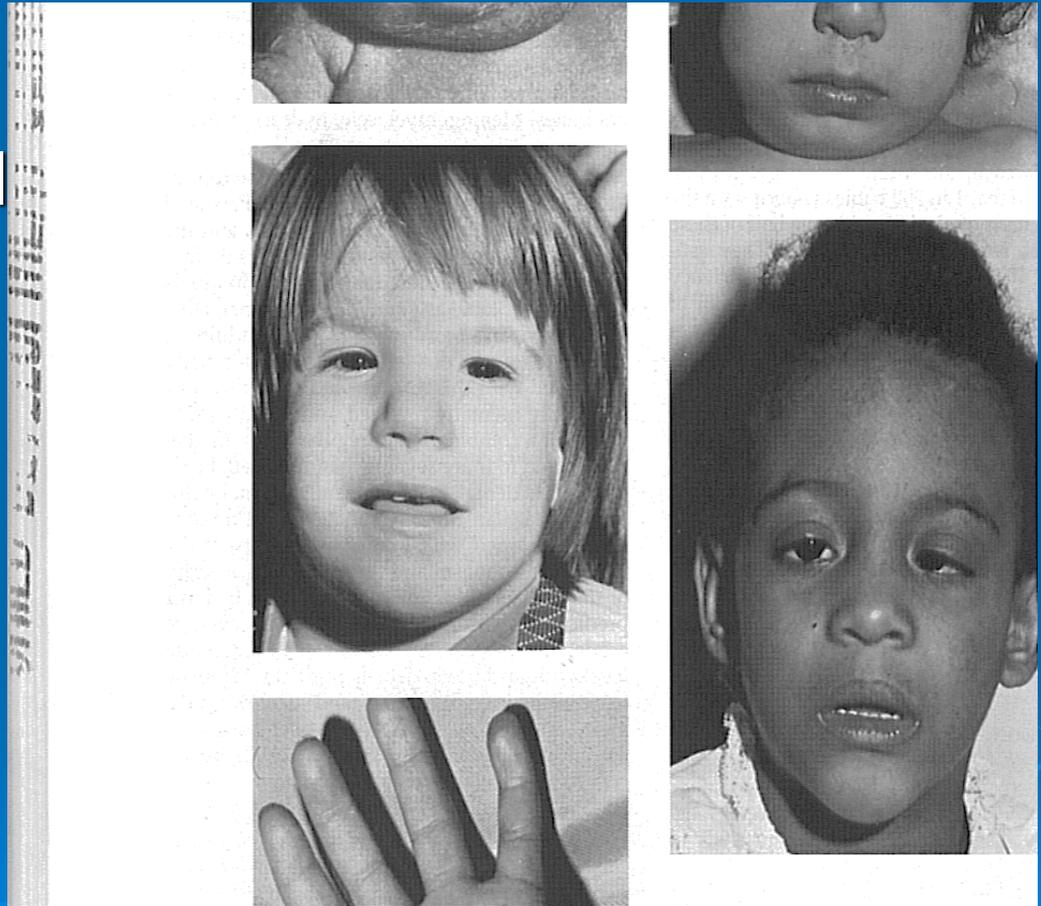
FAS



- Pre- and postnatal growth deficiency
- Learning problems:
 - Average I.Q. 63
 - Fine motor dysfunction, poor eye-hand coordination, tremulousness
 - Cranial facial
 - Microcephaly, short palpebral fissures, maxillary hypoplasia, short nose, smooth philtrum, smooth, thin upper lip

FAS

- Skeletal: joint abnormalities, small distal phalanges, small 5th fingernails
- Cardiac: heart murmur, ventricular septal defect most common





Alcohol Related Neurodevelopmental Disorder (ARND)

- Refers to a range of affects physical, mental, behavior, and/or learning problems that occur in children whose mothers drank alcohol during pregnancy but did not meet the full criteria for FAS.
- A newer term that has been used is Fetal Alcohol Spectrum Disorders.

Newborn Presentation of FAS/ARND

- Prematurity and/or low birth weight can result from 2-3 drinks per day
- Small for gestational age
- Hypotonic
- Irritable
- Tremulous
- Degree of teratogenesis increases dramatically with maternal alcohol consumption

What is the Behavioral Phenotype of FAS/FAE?

- Over-stimulated in social situations
- Over-reacts to situations
- Rapid mood swings - possibly set off by insignificant events
- Poor attention span
- Severe hyperactivity
- Violent/aggressive behavior either to self or others

What is the Behavioral Phenotype of FAS/FAE?

- Seemingly unaware of consequences of his behavior
 - Poor judgment of individuals
 - Doesn't read social cues well
 - Desires to be the center of attention
 - Poor self regulation
 - Developmental delays
- 

What to Expect in Infancy

➤ Physical complications

- heart deficits
- organ and skeletal malformations
 - midline defects may include heart, cleft lips and palate, scoliosis
- skeletal deficits
- hearing and vision problems
- motor problems

There May Be No Physical Findings But...

- Behavioral problems may include:
 - tremulousness
 - irritability
 - hyperexcitability
 - poor sleep
 - poor suck
 - growth problems

What Can You Do?

- If failure to thrive, medical work up is indicated
 - additional calories may be needed
 - modified feeding techniques can be used
 - therapy may be necessary

What Should The Environment Be Like?

- Calm
- Soothing
- Predictable



How Should Delays Be Identified?

- Work up by trained physician
- Developmental testing
- Referral to appropriate intervention resources

Toddlers/Pre-School

- Hyperactivity and lack of self regulation may be overwhelming problems
- Developmental delays need to be further delineated
- Resources should be given to help parents and children strategies to maintain emotional control
 - communication
 - self-awareness
 - coping strategies

School Age Years

- Problems that can occur:
 - severe ADHD
 - learning disorder
 - social/peer problems
 - school failure

Interventions Needed

- Special accommodations for Attention Deficit Hyperactivity Disorder symptoms
- Special accommodations for learning problems
- Social skills training
- Behavioral help for the parents
- ?Medication

Adolescents

- Peer group problems
- Poor judge of character
- Exploitation by others
- Problems with the law
- Rejection

Tobacco



- In the U.S. more than 20% of women smoke.
- Many continue to smoke during pregnancy despite growing evidence of harm to the fetus.
- According to the U.S. Public Health Service, if all pregnant women stopped smoking there would be a 11% reduction in still births and a 5% reduction in newborn deaths.

How Does Smoking Harm the Infant?

- **Pregnancy Complications:**
 - Doubles the risk of placenta previa and placental abruption.
 - Increase the risk of premature rupture of membranes.
 - Increase the risk of preterm delivery
- **Low Birth Weight:** 12% of smokers' babies were low birth weight compared to 5% of non-smokers. (If a woman stops smoking in the 1st trimester she is no more likely to have a low birth weight infant than the nonsmoker.)

Smoking Affects Neurobehavioral Outcome

Recent research has shown:

- Infants exposed to tobacco in utero were highly aroused, more highly excitable, showed signs of stress and drug withdrawal.
- The greater the exposure, the more significant the effects.

Law, K.L. et. al. Smoking during pregnancy and newborn neurobehavior. *Pediatrics* 111(6):1318-1323, 2003.

Other Problems in Children whose mothers smoked in pregnancy

- Auditory Memory Deficits
- Lower Reading Scores
- Increased attentional and hyperactivity problems

Cocaine

- Since the mid 1980's, approximately 1,000,000 US children have been exposed to cocaine in utero
- True impact of cocaine use has been difficult due to other substances used and poor prenatal care in these pregnancies.

How Does Cocaine Hurt an Unborn Baby

- Cocaine readily crosses the placenta and effects the fetus
- During early months may increase risk of :
 - Miscarriage
 - Stroke
 - Cardiac damage
- During later pregnancy:
 - May trigger premature labor
 - Placenta abruption



Characteristics of Affected Infants

- Prematurity
- Low birth weight
- Microcephaly
- Piercing cry
- Irritability/hypersensitivity
- Tremulousness
- Sleep patterns
- Evidence that cocaine use shortly before birth is associated with stroke in utero
- Higher incidence of SIDS

Cognitive and Motor Outcomes of Cocaine-Exposed Infants

Singer, L.T., et al. *JAMA* 287(15): 1952-1960, 2002

- NIDA-Supported Study Separated The Affects of Cocaine from Other Confounders (tobacco, alcohol, etc.)
- Cocaine exposed children scored 6 points lower on the mental development index averaging 82.7 standard score as opposed to an 88.7 score in the unexposed children
- 14% of cocaine exposed children scored in the mentally retarded range while 7% in the unexposed, compared to 2% in the general population
- 38% of cocaine exposed children had developmentally delays requiring intervention while 20% of the unexposed children in this group and approximately 5-10% in the general population

Suggestions for Caring for Cocaine Exposed Infants

- Don't allow the child to become frantic – sooth as early as possible
- Use both swaddling and pacifiers to help calm
- Stimulate the infant gently



What Can We Do?



➤ Spread the Word!

- Make sure children are educated early about the dangers of these drugs during pregnancy. Remember they are the ones who will be parents one day.
- Educate women of childbearing age.
- All pregnant women should be screened for any alcohol, tobacco or other drug use during pregnancy.

➤ Help Don't Shame.

Case Presentations



Gregory

2 year old white male who was referred by his local pediatrician due to his dysmorphic features and speech delay. MGM is the custodian because mother is described as being an alcoholic. He has received services from the Early Intervention Program once a week. He is described as sweet and loving but has a short attention span and is very hyperactive. He can't sit still for meals or to watch TV.

He can follow directions if it something he wants to do.

Health History

- Frequent ear infections, sinus infections, and allergies
- Concerns about hearing
- Gastroesophageal reflux
- Hypospadias repair
- Right leg stiffness
- Questionable staring spells
- Delayed gross and fine motor milestones and speech language milestones

Physical Exam

- Height 90%
- Weight 40%
- Head 5%
- Active but happy
- Facial stigmata consistent with FAS
 - smooth philtrum
 - flat mid face
 - short upturned nose
 - short palpebral fissures
 - wide nasal bridge
 - small jaw

Developmental Testing

- Significant speech language delay
- Mild global developmental delay

Recommendations

- Formal hearing test was scheduled
- EEG was scheduled
- Referral for behavioral intervention
- Continue in First Steps Early Intervention with increase in speech language therapy

If Intervention does not happen early...

- Thomas is a 14 y/o who is in the 8th grade at an alternative school.
- Referred to CDC by the Adolescent Offender Program for evaluation.
- Involvement in the program occurred due to
- He was first seen by the local mental health center for carrying a knife to school at age 7!
- There were increasing tantrums and behavioral issues at school that seemed to worsen after father moved out of state.
- Ray lived with his mother. There was a long history of neglect from birth until about 5 years ago when mother who was an alcoholic and crack cocaine user was found dead.

Now in Dad's Home

- He has been involved in the AOP on and off for the last 5 years with little success.
- He has been in training school several times.
- Behaviors in school are described as oppositional, defiant, disruptive, and disrespectful.
- His most recent involvement in AOP is due to his braking into a car and stealing money out of it.
- He has stolen from Dad and Step-mom and recently stole one of his dad's guns.

What we found

- Some facial signs of FASD
- Very impulsive and fidgety even during 1:1 testing
- Spoke freely of troubles with the law, not remorse
- Average Intelligence
- Very low testing in both reading (reading at a 2.8 grade level) and math. Qualified for a reading and arithmetic disorder.

Recommendations

- Special Education services to help with both reading and mathematics.
- Residential Placement due to many failed out-patient trials.

Mario

12 year old African-American male who has been followed by the Child Development Clinic for FASD since 1996 when at age 3 his diagnoses included mild developmental delay, articulation disorder, expressive language disorder, a history of neglect, foster care placement, and history of maternal illicit drug use and alcohol during pregnancy.

Continued History

Foster care placement occurred at 3 months of age and adoption occurred later. He has been placed in a loving, nurturing home with an adoptive mother and father.

Early on he received Early Intervention Services in the area of speech language and education.

Repeat testing at age 5 revealed borderline intelligence.

Physical Exam

- Height, weight and head circumference are all in the normal range.
- Physical examination reveals normal facial features except for slightly short palpebral fissures and a flat nasal bridge. There are no other abnormalities.

Behavioral Problems

Mario has had a long history of severe ADHD, quick temper, anger outbursts, over reaction to frustration, oppositional behavior, predominately at school but many behaviors occur at home. He presently attends regular class and is repeating the 5th grade.

Problems with aggression have at times been severe.

Interventions

- Ongoing behavior therapy
- Resource help through the school
- Medication to help control ADHD symptoms and aggressive symptoms
- Medication to help with sleep
- Family support

Long-term Outcome

- Mario was last seen in follow-up this month. He is now 13 y/o in the 7th grade.
- He has been adopted by the foster parents and is in a wonderful loving family.
- Grades are all passing, still some problems in reading comprehension.
- He is on 2 medications: Risperdal to help with aggression and anger control and clonidine to help with hyperactivity and impulsive behavior.
- He has friends, loves his siblings and enjoys life.
- Parents are ever vigilant, loving and caring.
- Behavioral advice is given at every visit.

**Early intervention with
appropriate services and a
loving home can make a huge
difference!**



Resources

- www.cdc.org
- www.nih.org