Fetal Alcohol Spectrum Disorder

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If you drink, don’t drive. Don’t even putt. —Dean Martin

Learning Objectives:
1. Recognize the prevalence of prenatal alcohol exposure resulting in a fetal alcohol spectrum disorder
2. Describe the diagnostic features and core symptoms associated with the fetal alcohol spectrum disorders
3. Describe the long-term effects of the fetal alcohol spectrum disorders

Primary Reference:
   https://pediatrics.aappublications.org/content/138/2/e20154256

CASE ONE:

Faith Ann Seagram-Daniels is a 2-year-old girl who is presenting to your office for a new patient well child check. Before meeting her, you review the information in her medical chart received from her previous pediatrician’s office. You note she was born to a 20-year-old mother who had only one prenatal visit at 12 weeks, presented at 39 weeks in active labor, and delivered Faith without any complications. All growth parameters were below the 5th percentile (weight 1st percentile, length 4th percentile, head circumference 2nd percentile). Since then, she has been healthy but has been receiving early intervention services for global developmental delay. As you walk in the room, you notice distinct facial features often seen with fetal alcohol syndrome, and wonder if Faith might meet criteria.

1. What is fetal alcohol spectrum disorder (FASD)? How does it differ from fetal alcohol syndrome?
   Can you diagnose a FASD without confirmed exposure to alcohol?

Fetal alcohol syndrome (FAS) was first described in 1973 as a group of specific birth defects resulting from prenatal alcohol exposure (PAE). Due to increased recognition of the impact of PAE, in 1981 the US Surgeon General issued a public health advisory stating that alcohol use during pregnancy can cause birth defects, and by 1989 Congress passed a federal law stating that alcohol products must contain a warning label regarding the risk of birth defects.

Subsequent research consistently revealed that in utero alcohol exposure causes a wide range of physical, behavioral, and cognitive effects. It was the recognition that PAE causes a spectrum of disabilities that led to the non-diagnostic umbrella term FASD with more specific diagnoses contained within it. These diagnoses include FAS, partial fetal alcohol syndrome (PFAS), alcohol related neurodevelopmental disorder (ARND), alcohol related birth defects (ARBD), and neurobehavioral disorder associated with prenatal alcohol exposure (ND-PAE). It should be noted that the diagnostic categories for all but FAS are in flux; the effort is to ensure understanding of prognosis for children with similar clinical concerns.

PAE can be confirmed in a variety of ways. A history of maternal alcohol use during pregnancy may be obtained from the mother or another reliable source such as a family member or by other providers involved in the mother’s care such as a social worker. PAE is defined as a history of 6 or more drinks per week for at least 2 weeks during pregnancy, 3 or more drinks per occasion for at least 2 occasions during pregnancy, documented social or legal problems related to alcohol intake (e.g., driving under the influence of alcohol), laboratory evidence of alcohol intoxication during pregnancy, or a positive score on a validated screening tool (e.g., T-ACE or AUDIT). Screening pregnant women is recommended by the American Congress of Obstetricians and Gynecologists (ACOG) during the first trimester for obstetric...
providers; pediatric providers would obtain this history as part of the well newborn evaluation. Finally, alcohol exposure biomarkers (i.e., fatty acid ethyl esters, phosphatidylethanol, ethyl glucuronide) are used at the time of birth in research settings to define PAE.

The diagnosis of FAS or PFAS can be made with or without known PAE. Moderators should refer to Table 1, Figure 1, and photographs in the AAP clinical guidelines by Hoyme, et al. for a detailed list of the diagnostic criteria, a diagnostic flowchart to differentiate among FASD diagnoses, and photographs that highlight facial characteristics. Based on the guidelines, four criteria are required for diagnosis of FAS: 1) characteristic facial features, 2) prenatal and/or postnatal growth deficiency, 3) deficient brain growth, abnormal morphogenesis, or abnormal neurophysiology, and 4) neurobehavioral impairment. Cardinal facial features include reduced palpebral fissure length, a smooth philtrum, and a thin upper lip. At least two of these three features must be present to meet criteria.

A child with confirmed PAE meets criteria for PFAS with at least two characteristic facial features and evidence of neurobehavioral impairment; if PAE is not documented, more stringent criteria are required for a diagnosis of PFAS.

Unlike FAS and PFAS, the diagnoses of ARND and ARBD require documented PAE. A child with ARND must have evidence of neurobehavioral impairment, while a diagnosis of ARBD requires one or more birth defects known to be associated with alcohol exposure in utero. Organs and systems commonly involved in ARBD include the cardiovascular, renal, musculoskeletal, ocular, and auditory systems. Other examples of such birth defects include maxillary hypoplasia, migrionathia, cleft palate, epicanthal folds, and clinodactyly. ARBD as an isolated FASD is rare.

ND-PAE is included in the DSM-5 as a “condition for further study.” While the terminology continues to evolve, the diagnosis of ND-PAE overlaps with ARND and aims to describe the behavioral and mental health effects on an individual with PAE. Unlike ARND, a diagnosis of ND-PAE can be given in addition to FAS or PFAS. Proposed criteria for ND-PAE include confirmed PAE and symptoms beginning in childhood with clinical features of impairments in neurocognitive functioning, self-regulation, and adaptive functioning. The intention of adding the ND-PAE diagnosis to the DSM was to allow children to access necessary clinical services to help with impairments or problems in areas such as neurocognitive function (global intellectual functioning, executive functioning, learning, memory, or visual-spatial reasoning), self-regulation (mood or behavioral regulation, attention, or impulse control) and adaptive functioning (communication skills, social communication and interaction, daily living skills, or motor skills).

Other diagnoses to consider in the differential diagnosis of FASDs include exposure to other prenatal toxins, trisomy 21, Williams syndrome, Noonan syndrome, 22q11 deletion syndromes, and Fragile X syndrome. Given the complexity of the diagnostic process, the AAP recommends that a full evaluation of FASD be conducted by a multidisciplinary team consisting of clinicians from various training backgrounds (such as geneticists, psychologists, developmental behavioral pediatricians, psychiatrists, speech pathologists, occupational and physical therapists, audiologists, and ophthalmologists). The role of the primary care clinician in diagnosis is to identify children requiring further evaluation based on physical and developmental features.

2. How common are the FASDs? Which populations are considered high risk for FASDs?

Taking into account that half of women of child bearing age in the United States report alcohol intake in the last month, one can see how unintentional PAE can occur, even before a woman knows she is pregnant. Up to 15% of women of child-bearing age report binge drinking, a pattern of alcohol use during which the blood alcohol concentration reaches 0.08% or above; in women defined as the ingestion of four or more standard drinks per occasion. Although it is widely advertised that PAE can cause harm to the fetus, 7.6% of pregnant women report continued alcohol use during pregnancy, and 1.4% report binge drinking during pregnancy. Maternal factors that increase the likelihood of having a child with an FASD, and should increase the pediatric provider’s alertness for the diagnosis, include a personal history of alcohol and/or drug use, a partner or close family member with an alcohol use disorder, alcohol use during a previous pregnancy, poor prenatal care, and unemployment. A history of social services involvement for possible neglect, abuse, or abandonment, as well as a history of foster care or adoption, should indicate a need for careful screening as these children may be at risk of in utero alcohol exposure.
While FASDs are considered among the most common identifiable causes of developmental delay and intellectual disability, determining the exact prevalence of FASDs is challenging for many reasons, including difficulty obtaining history, varying phenotypes, inconsistent terminology, multiple subtypes, the use of various study populations, and the differing methods of data collection. Since FAS was first described, data on prevalence has been gathered from prenatal clinics, specialty clinics, and surveillance systems, but the syndrome is still thought to be underreported. A 2014 study by May, et al. that used a robust case identification method reported rates of 24 to 48 cases per 1000 children (2.4 to 4.8%) for all FASDs, and 6-9 cases per 1000 children (0.6 to 0.9%) for FAS specifically, though these rates were still thought to be low. Similar rates of FAS have been reported for certain high risk groups, including those living in poverty and American Indian populations. Rates of FAS of 1 to 1.5% of children living in foster care have been reported; children often end up in foster care due to adverse family circumstances including parental drug or alcohol use.

CASE continued:

| Faith’s mother denies alcohol or other substance use during pregnancy. You are still concerned given the patient’s characteristic facial features and developmental delay, so you refer her for a multidisciplinary evaluation to rule out other possible diagnoses. A few weeks later you receive a consult letter confirming that she was diagnosed with fetal alcohol syndrome by a multidisciplinary team. |

3. What are some of the possible behavioral and cognitive difficulties to look for related to Faith’s new diagnosis?

There are a wide variety of effects related to CNS dysfunction caused by PAE, ranging from relatively mild developmental delays to severe intellectual disability. In infants, the symptoms are vague and may include irritability, poor feeding, sleep difficulties, a tendency to become easily overstimulated, or a lack of bonding with caregivers. Young children may demonstrate developmental delays, inattention, impulsivity, internalizing problems, externalizing problems, social impairments, and behavioral difficulties such as frequent tantrums or aggressive behavior. The neurocognitive profile of children with an FASD includes challenges with visual-spatial reasoning, auditory comprehension, use of pragmatic language, and executive functioning skills. Deficits in the last of these, executive function, are often more apparent as the child gets older and is asked to keep up with more demanding work and increased responsibility in school, and can manifest as slower processing speed, poor impulse control, and deficits in problem solving and planning.

In adolescents, difficulties with abstract reasoning, time and money management, and social and adaptive skills may become more pronounced. It is important to note that although children and teens with an FASD may demonstrate deficits in social skills, the majority of studies have not shown an association with autism spectrum disorder. As these adolescents become young adults, such deficits can continue to cause significant impairment. While the majority of individuals with an FASD do not have intellectual disability, those who do may demonstrate poor adaptive skills and may not be able to live independently, requiring structured living environments to assist with activities of daily living, social skills, and money management. There are also higher rates of under- or unemployment, legal problems, high risk sexual behaviors, incarceration, and substance use into adulthood.

The increased incidence of attention deficits and of attention deficit hyperactivity disorder (ADHD) is one of the most common and well-studied neurodevelopmental effects. Some children with an FASD meet the criteria for ADHD with the characteristic symptoms of inattention and/or hyperactivity. However, other children may have particular difficulty holding information in short-term memory and then using that information to perform subsequent tasks, as well as difficulty with shifting attention. Additionally, individuals with an FASD have higher rates of psychiatric disorders, including mood disorders, anxiety, substance use, and suicide; studies show there is a 95% lifetime likelihood for children and adolescents in this population to develop some type of mental health disorder. It is likely that a delayed diagnosis or missed diagnosis contributes to higher rates of secondary emotional and psychiatric disorders.

4. What treatments are available to help children with FASDs?
While there is no cure for the FASDs, one of the most important aspects to identifying appropriate treatments is early diagnosis - ideally before 6 years of age - which has multiple benefits for the child and family. Treatment should be individualized to address the impairing symptoms and provide a stable, enriching home and educational environment. Medically, it allows for close observation to ensure adequate growth and optimal nutrition, since many children demonstrate post-natal growth deficiency. Referrals to sub-specialists, such as a geneticist or neurologist, can be initiated at the time of diagnosis if the necessary teams are not yet involved. For example, a child with an FASD with concern for attention deficits should be referred to a specialist, as these children often experience a suboptimal therapeutic response to traditional stimulant medications, with an improvement in the level of hyperactivity noted by parents but no significant effect on inattention or impulsivity (which may go undetected if not specifically assessed). Children with FASDs are often prescribed multiple medications and may end up on higher doses than typically required. Establishing a multidisciplinary care plan to identify and address PAE-related medical problems in the child and his or her family members is an essential step in their treatment, and may lead to recognition of a previously undiagnosed substance use problem in the mother, or prenatal exposure to alcohol or other illicit drugs in other siblings if maternal substance use has been long standing.

From a social perspective, if the child is living with the biological mother suspected of alcohol use during pregnancy, there is an opportunity to provide not only medical treatment but also social support if needed. Emotional support from a trusted provider may be invaluable in the time following diagnosis and can hopefully ease some of the family’s distress. Connecting the family to community resources has the potential to improve the family’s living situation, assist with financial difficulties, help parents develop strategies to deal with challenging behaviors, and more. As new issues arise, the family can hopefully utilize such resources for support, especially given that deficits associated with the FASDs tend to be lifelong. The goal for providing social support is to improve or stabilize the child’s social circumstances, identify any barriers, and to build on the child and family’s strengths in order to give them the best opportunity to reach their potential.

In infants and young children with an FASD, early developmental intervention may ameliorate developmental delays and speech problems, or improve social skills. Children with FAS qualify for “presumptive eligibility” under the Individuals with Disability Education Act part C (covering ages birth to three) due to their increased risk of developmental delays. Although not explicitly covered in part B (ages three to 21), children may fall into one of the designated categories such as specific learning disability, intellectual disability, speech and language impairments, emotional disturbance or other health impaired, among others. Therefore, when the child reaches school age, an educational evaluation will be crucial for identifying deficits that may hinder her learning and allow for an individualized plan to be put in place to best help her succeed. This comprehensive psychoeducational evaluation is particularly important, as children with an FASD often appear to be functioning at a higher level than they truly are due to relatively strong verbal skills. Given the wide range of effects of PAE, educational accommodations will vary but may include speech therapy for children with speech delay, more time for test taking for children with slower processing speed, preferential seating for children with attention problems, or social skills groups for boys and girls with social skills deficits. Reassessments at regular intervals can ensure that children with FASD are continuing to receive the appropriate services.

5. What is the role of the primary care provider in relation to FASDs?

The primary care provider plays an important role in the prevention, identification and management of children with an FASD. The AAP released a clinical report in 2018 to increase pediatrician awareness of FASDs, improve rates of screening, and provide information on managing these disorders in the medical home. This report emphasizes the critical importance of universal screening and provides a guideline for management, coordination of care, and how best to support families after the diagnosis is made.

PAE with a resulting FASD is preventable, and primary care providers are in a prime position to educate young women on alcohol use during pregnancy and the consequences for the baby. By the time girls are reaching child-bearing age, visits should include open discussions about sex, unplanned pregnancy, and substance use. Many people mistakenly believe that alcohol is safe during pregnancy in small quantities, and so continue to consume alcohol during pregnancy. Given the risks of PAE, in a 2016 statement the
CDC recommends that women of child-bearing age abstain from alcohol if they “are trying to get pregnant or could get pregnant,” the implication being that women not using contraception should not consume alcohol.

Teenagers should be provided with anticipatory guidance regarding these issues at their yearly well visits, and should be screened for alcohol and substance use and referred for treatment if needed. If a young woman becomes pregnant, it is equally important to reinforce the negative effects of alcohol use during pregnancy, as earlier cessation of alcohol is associated with lower rates of PAE-associated complications - drinking in all trimesters makes the likelihood of an FASD five times more likely than drinking in the first trimester only. A prenatal office visit is another opportunity to educate pregnant women about such risks and encourage cessation of alcohol use during pregnancy.

History of PAE should be obtained in the well newborn nursery as a part of the standard intake. The history may already be available as a part of the prenatal history. If not, this part of the interview could begin with a discussion of the mother’s general health then proceed to the more sensitive questions relating to alcohol intake. A woman’s drinking habits in the 3 months prior to pregnancy may reflect alcohol intake in early pregnancy. If possible, obtaining information on the timing, quantity, and frequency of alcohol intake during pregnancy is preferable and allows for assessment of potential binge drinking. To ensure screening is completed on every new patient, practices may consider developing a standard process such as a script or a prompt in the electronic medical record.

Recognizing the signs of the FASDs and identifying children with a possible FASD is another important aspect of caring for children. The diagnosis is not always considered for a variety of reasons including lack of uniform terminology and definitions of the FASDs, lack of training, lack of appropriate treatment, fear of litigation, and fear of stigmatization for the mother and child. Awareness of the cardinal features of the FASDs and maintaining a high level of suspicion can lead to early identification and referral, but a recent study which examined whether general pediatricians consider FASDs when evaluating children with developmental and behavioral concerns, found that only 17.4% identified FAS when provided with a photograph and characteristic case presentation, and 63.1% identified ARND, in contrast to 73.9% able to identify Williams syndrome. Therefore, maintaining a high level of suspicion is essential, and primary care providers should consider a diagnosis of FASD for any child with growth problems, complex neurodevelopmental issues, or birth defects.

In 2010, the federal Child Abuse Prevention and Treatment Act (CAPTA) was revised to include mandates regarding the FASDs (as well as infants withdrawing from prenatal drug exposure and those affected by substance use), stating that providers involved in the delivery or care of these infants must make “appropriate referrals” to child protection services, with the goal of implementing a plan for safe care. The distinction between PAE and FASD in the law is particularly salient in the postpartum period when the history of PAE should be a part of the overall evaluation; most of the FASD will not be diagnosable at the time of birth, and PAE in itself is not reportable. Thus, providers should not be hesitant to ask questions that will help the child to maximize health and should feel comfortable discussing possible PAE in an open and supportive manner with the family. Even if the child’s case is ultimately reportable, it should be emphasized that the goal is to optimize the care of the child and family and to link them with the appropriate resources, and that the report does not constitute suspicion of abuse or neglect and does not obligate the system to prosecute for any illegal action. Lastly, identifying a child with possible features or signs of an FASD does not mean the primary care provider needs to make the diagnosis and report the case, but rather that the family should be referred to a specialist with expertise in diagnosing an FASD who can tie the child to all possible services.

As discussed earlier, the care of an infant or child with an FASD involves a multidisciplinary approach. The primary care provider can develop a medical home for the child and family; helping them navigate the system, especially as the child’s needs change as they get older and require new community resources and support. Similar to children with other complex health care needs, the medical home can provide the necessary coordination and collaboration with other health care providers for diagnosis and management of an FASD and associated conditions, as well as collaborating with school systems, social services, and legal supports to ensure the best possible outcome. Another important referral to consider for children with an FASD is for Supplemental Security Income (SSI), which can provide a low-resource family with additional income to help with expenses related to the child’s medical or therapeutic
services. During the transition from childhood to adulthood, consider assisting the young adult with income support and medical insurance.

Finally, given the fact that the FASDs are preventable, that there are significant effects on children’s health and development, and that the economic toll of alcohol use during pregnancy is high, health care providers can also make a difference through community-based education and advocacy.

Additional References:

Resources:
2. AAP resources for PAE screening: http://www.aap.org/pae
3. CDC information on FASD. Free educational materials to print for families. www.cdc.gov/fasd and http://www.cdc.gov/vitalsigns/fasd/
4. Handouts and resources from National Organization on Fetal Alcohol Syndrome. www.nofas.org