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Effects of prenatal alcohol exposure in a prospective sample of young adults: Mental health, substance use, and difficulties with the legal system



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ABSTRACT

Introduction: Few studies have focused on the transition to adulthood in adults with prenatal alcohol exposure (PAE). In this study, we examine the occurrence of problem behavior at this transition, including mental health problems, substance use, and difficulties with the legal system. The sample is prospective and provides an opportunity to examine effects of a wide range of prenatal exposure. Adults with PAE were expected to show more problem behavior; the impact of level of exposure was examined as well.

Method: The sample was drawn from a predominantly low-income, African-American population. Mothers of the alcohol-exposed participants ($n = 123$) and those in the non-exposed SES-Control group (CONT) ($n = 59$) were recruited at a prenatal visit when information on alcohol and drug use during pregnancy was collected. A disability contrast group ($n = 54$) was recruited at adolescence. The adults with PAE were assigned to three groups varying in physical and cognitive effects of exposure. This report is based on the adults' responses to interviews or questionnaires on problem behavior and laboratory tests related to substance use.

Results: Adults with PAE showed more problem behavior in all three areas than adults from the CONT group. For mental health problems, the exposed group showing cognitive, but not physical effects, had the highest scores; their scores were similar, however, to those of the disability contrast group on several scales. Results for outcomes on substance use and legal difficulties were less consistent, but, when significant effects occurred, the group that was exposed, but neither physically nor cognitively affected, was more likely to show negative outcomes. Males in this group were most involved in these behaviors.

Conclusion: Effects of PAE continue into early adulthood and affect mental health problems, substance use, and interactions with the legal system. Adults who are exposed, but less physically affected, seem to be the most involved in problem behavior. More research is necessary to examine environmental effects in conjunction with PAE on these outcomes and to provide a basis for developing potential interventions.

1. Introduction

While effects of prenatal alcohol exposure (PAE) have been studied extensively in children (e.g., Kodituwakku, 2007; Flak et al., 2014; Mattson et al., 2011), there has been relatively little research on effects of PAE on adaptive development and problem behavior in adults, particularly at the transition to adulthood (Lynch et al., 2015; Day et al., 2013). This is a topic of great interest given the frequently expressed concern that PAE is associated with increased rates of substance abuse and criminal behavior (Streissguth et al., 1996; Fast et al., 1999).

PAE is related to a variety of physical and neurodevelopmental problems (e.g., Riley et al., 2011; Mattson et al., 2011). Jones and Smith

(1973) first described fetal alcohol syndrome (FAS), the most severe outcome of prenatal alcohol exposure, more than forty years ago; effects include a specific pattern of dysmorphic facial characteristics, slow or delayed physical growth, and neurodevelopmental problems related to effects of PAE on the central nervous system. Since that time, a range of effects varying in severity on physical, cognitive, and behavioral development has been described and defined collectively as fetal alcohol spectrum disorders (FASDs) (Warren et al., 2011; Senturias, 2014; Riley et al., 2011). According to the Centers for Disease Control and Prevention (CDC) (2016), prevalence estimates for FAS based on record reviews in previous surveillance studies (CDC, 2002, 2015) suggest a rate of 0.2 to 1.5 per 1000 infants born. Recent studies by May and colleagues (May et al., 2009, 2014) suggest that estimates for

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prevalence for the full FASD spectrum may be as high as 2–5% in the U.S. and in some western areas of Europe. The CDC (2016) reports this estimate as well.

Streissguth et al. (1996) also introduced the concept of PAE-related secondary disabilities (as compared to primary disabilities that affect physical and intellectual characteristics). These disabilities are not present at birth, but develop over time and may be responsive to interventions; problem behaviors such as substance use, mental health problems or involvement in criminal behavior are considered secondary disabilities. Severity of these disabilities also is related to risk and protective factors occurring in the individual's environment.

The transition from adolescence to adulthood presents critical challenges to individuals with FASDs; their ability to navigate this transition is likely to affect adaptive behavior throughout the adult years. Osgood et al. (2005) have discussed the difficulties young people with disabilities face in meeting the challenges of this transition due to limitations in their abilities and skills. In addition, as they reach adulthood, educational supports and services that may have been helpful in childhood and adolescence are often no longer available to them. Osgood described the challenges as including both 1) difficulties in entering adult educational, work, and family roles, and 2) structuring or managing adult life, which includes learning to avoid problem behaviors independently. Young adults with FASDs are vulnerable in both these areas due to limitations in cognitive and behavioral capabilities. While Lynch et al. (2015) focused on difficulties faced by young adults affected by PAE on adaptive function and entry into adult roles, this companion paper focuses on the transition to adulthood in the same individuals and effects on problem behavior. Prior work on problem behavior suggests that the areas of mental health, substance use, and legal difficulties will be particularly relevant for young adults with FASDs (e.g., Streissguth et al., 1996, 2004; Famy et al., 1998; Fast et al., 1999; Baer et al., 2003; Alati et al., 2006).

1.1. Mental health issues

Several studies based on a variety of data sources show a strong relationship between PAE and mental health problems in adults (O'Connor and Paley, 2009; Streissguth et al., 1996; Famy et al., 1998; Freunsch and Feldmann, 2011; Rangmar et al., 2015; Day et al., 2013; Barr et al., 2006). Streissguth et al., and Famy et al., both examined rates of mental health problems in samples of adults with PAE-related diagnoses and reported that large proportions experienced difficulties in this area. Streissguth et al. found that, based on informant ratings of adults aged 21–51, more than 50% had experienced problems with depression, 29% had psychotic symptoms, and 23% had attempted suicide. In their examination of records from national health registers in Sweden, Rangmar et al. (2015) reported that 32.9% of the FAS group had received hospital care for a psychiatric disorder and 57.3% had been prescribed at least one psychotropic medication between 2005 and 2011 as compared to 4.7% and 26.5% respectively for the comparison group.

Both Barr et al. and Day et al. focused on younger adults in their studies. Barr et al. reported that, in their analysis of data from a non-clinical sample, binge-drinking in pregnancy was related to psychiatric problems in early adulthood; the odds ratios for six psychiatric disorders were at least two times higher for offspring of mothers who binged in pregnancy when compared to adults whose mothers did not. It should be noted that Barr et al. controlled for a number of other potential factors that may influence development of psychiatric disorders, including family history of psychiatric problems, in their analysis. Day et al. analyzed self-report data on behavior problems at 22 years of age for their prospective longitudinal sample. They administered the Adult Self Report (Achenbach and Rescorla, 2003), a standardized measure of behavior problems that yields summary scores on Total Problems, Internalizing and Externalizing as well as scores on subscales. Results showed that, with relevant covariates controlled,

prenatal exposure was related significantly to higher scores on Internalizing, Externalizing, Total Problems, Critical Items, and Attention scales.

1.2. Substance abuse

Several studies support a relationship between PAE and substance use in adulthood (e.g., Alati et al., 2006; Baer et al., 2003; Famy et al., 1998; Streissguth et al., 2004, 1996; Yates et al., 1998), although not all studies are consistent (Freunsch and Feldmann, 2011). Streissguth et al. reported that about 46% of the adults in their clinical sample had experienced alcohol or drug problems. Binge drinking and consumption of higher amounts (i.e., three or more drinks per occasion) of alcohol by mothers during pregnancy have been related to increased risk for alcohol disorders in adulthood (Baer et al., 2003; Alati et al., 2006). Rangmar et al., in their study based on Swedish health registries, reported higher rates of hospital treatment for alcohol-related disorders and drug use for adults in the FAS group (8.9% and 6.3%) as compared to the control group (1.6% and 2.5%).

1.3. Difficulties with the legal system

Studies of participation in criminal activity and incarceration by the criminal justice system suggest that PAE is associated with legal difficulties (Fast and Conry, 2009; Streissguth et al., 1996, 2004). Streissguth et al., reported that, for the 90 adults with PAE included in their sample, 58% reported having experienced “trouble with the law”, defined as having been in trouble with authorities, charged, or convicted of criminal behavior ranging from crimes against persons or property to less serious offenses such as escape or parole violations. Crimes against persons (e.g., assault, burglary, theft (including shoplifting), murder) were the most frequently reported crimes. When incarceration rates were examined, 35% of adolescents and adults included in the sample had been incarcerated at some point. On the other hand, Rangmar's examination of the Swedish Registry of Criminal Offenses showed that individuals diagnosed with FAS and those in the control group did not differ significantly in the rate of convictions (27.8% and 20.3% respectively) or in convictions for a serious crime (6.3% vs. 4.0%).

One possible explanation for these results is that Streissguth's sample includes both individuals with FAS and FAE, a less severe PAE diagnosis, while Rangmar's includes only adults with FAS. Both Fast & Conry and Streissguth et al., have pointed out that higher IQ is not protective when considering difficulties with the legal system and the odds ratios examining IQ as a predictor of these outcomes in Streissguth's study support this assertion. Inclusion of more participants who were less affected by PAE (and a large proportion with IQs over 70) in the Streissguth study is likely to have contributed to the higher reports of criminal behavior.

In summary, there is support in the literature for a relationship between PAE and problems related to mental health, substance use, and illegal behavior in adults. Few studies have focused on the transition to adulthood as a developmental period; and many have been based only on clinical samples (e.g., Streissguth et al., 1996). Outcomes for less severely affected young adults who have been exposed, but seem to be unaffected physically or cognitively, have not been thoroughly explored (Lynch et al., 2015). This prospective community sample of exposed adults, as opposed to samples in several previous studies, is not limited to clinically diagnosed participants and allows examination of problem behavior in young adults who represent a wide range of prenatal exposure to alcohol.

As discussed in detail in our companion paper (Lynch et al., 2015), there are three exposed groups in the analysis. The groups are defined by physical and cognitive effects of PAE: 1) the Dysmorphic group (DYSM) is most severely affected and shows dysmorphism associated with PAE; 2) the Cognitively Affected (COG-AFF) group includes

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