



Original article

Self-Reported Adolescent Behavioral Adjustment: Effects of Prenatal Cocaine Exposure

Meeyoung O. Min, Ph.D.^{a,*}, Sonia Minnes, Ph.D.^a, Susan Yoon, M.S.W.^a, Elizabeth J. Short, Ph.D.^b, and Lynn T. Singer, Ph.D.^{c,d,e}^aJack, Joseph and Morton Mandel School of Applied Social Sciences, Case Western Reserve University, Cleveland, Ohio^bDepartment of Psychological Sciences, Case Western Reserve University, Cleveland, Ohio^cDepartment of Environmental Health Sciences, School of Medicine, Case Western Reserve University, Cleveland, Ohio^dDepartment of Psychiatry, School of Medicine, Case Western Reserve University, Cleveland, Ohio^eDepartment of Pediatrics, School of Medicine, Case Western Reserve University, Cleveland, Ohio

Article history: Received May 22, 2013; Accepted December 20, 2013

Keywords: Prenatal cocaine; Behavior; Attention; Adolescents

A B S T R A C T

Purpose: To assess the direct effects of prenatal cocaine exposure (PCE) on adolescent internalizing, externalizing, and attention problems, controlling for confounding drug and environmental factors.**Method:** At 12 and 15 years of age, 371 adolescents (189 PCE and 182 noncocaine exposed), primarily African-American and of low socioeconomic status, participating in a longitudinal, prospective study from birth were assessed for behavioral adjustment using the Youth Self-Report.**Results:** Longitudinal mixed model analyses indicated that PCE was associated with greater externalizing behavioral problems at ages 12 and 15 years and more attention problems at age 15, after controlling for confounders. PCE effects were not found for internalizing behaviors. PCE adolescents in adoptive/foster care reported more externalizing and attention problems than PCE adolescents in biological mother/relative care at age 12 or noncocaine-exposed adolescents at both ages. No PCE by gender interaction was found. Prenatal marijuana exposure, home environment, parental attachment and monitoring, family conflict, and violence exposure were also significant predictors of adolescent behavioral adjustment.**Conclusions:** PCE is a risk factor for poor behavioral adjustment in adolescence.

© 2014 Society for Adolescent Health and Medicine. All rights reserved.

IMPLICATIONS AND
CONTRIBUTION

Adolescents prenatally exposed to cocaine reported more problems in attention and externalizing behaviors than noncocaine-exposed adolescents, controlling for confounding drug and environmental factors. Findings from this prospective, longitudinal sample are consistent with neuroimaging studies, suggesting that PCE leads to alterations in behavioral domains of the prefrontal cortex.

Poor behavioral adjustment during adolescence is linked with early onset of substance use and later adult mental health problems. Prenatal cocaine exposure (PCE) may increase the risk for behavioral problems throughout childhood [1–4]. PCE disrupts the monoaminergic neurotransmitter system in the prefrontal cortex, affecting emotional and behavioral arousal and regulation, attention, and stress response [5]. The neurobehavioral teratology

model [6] posits that the effects of damage to the developing central nervous system incurred prenatally can extend through later periods of development. Long-term developmental outcome is affected by the timing, duration, and dose of the teratogen in utero, and aspects of the environmental context can modify outcomes, either exacerbating or ameliorating early effects. Additionally, depending on the brain regions affected, some teratogenic effects may not be evident until the cognitive or behavioral domains implicated are emergent.

Several prospective longitudinal studies have documented PCE-related behavioral problems in childhood [1,2] and preadolescence [3,4]. PCE effects have been found on child-reported

* Address correspondence to: Meeyoung O. Min, Ph.D., Case Western Reserve University, Jack, Joseph and Morton Mandel School of Applied Social Sciences, 11235 Bellflower Road, Cleveland, OH 44106-7164.

E-mail address: meeyoung.min@case.edu (M.O. Min).

symptoms of oppositional defiant disorder and attention-deficit/hyperactivity disorder at 6 years of age [7], on caregiver-reported aggressive behavior at 9 years [8], on child-reported depressive symptoms and teacher-rated anxious/depressed behavior at 10 years [9], and on teacher- and caregiver-rated externalizing behavior problems at 7, 9, and 11 years [3], while other studies have found no such effects [10,11]. Further, mixed findings of PCE by gender interaction on behavioral adjustment have been noted, with PCE boys showing more clinically significant externalizing and delinquent behaviors [12] and deficits in attention [13] than noncocaine exposed (NCE) boys, while other studies reporting effects of PCE in girls only [2,8,14].

Early behavioral problems are likely to persist and intensify given the increasing developmental challenges and demands of adolescence, including puberty, school transitions, changing relationships with parents and peers [15], and further development of the prefrontal cortex and its associated networks. To date, only one study has examined behavioral outcomes in adolescents with cocaine/polydrug exposure [16] although it did not address cocaine-specific effects.

Isolating the effect of PCE on behavioral outcomes is complicated, as multiple biological and environmental confounders may obscure the long-term effects of PCE, including high exposure to other substances [17–19], elevated lead levels (≥ 10 $\mu\text{g}/\text{dl}$) [20,21], poor quality of the home environment [22,23], caregiver ongoing substance use and psychological distress [2,8,24], and adoptive/foster care placement [7]. Further, family conflict [25], violence exposure [3,26], poor attachment to caregiver [24], and inadequate parental monitoring [27], reflecting the interpersonal developmental contexts in which adolescents transact [28], may heighten the drug-exposed adolescent's vulnerability to behavior problems.

The present study extends previous findings to examine whether negative effects of PCE on behavior persist into adolescence. We hypothesized that adolescents with PCE would report more externalizing, internalizing, and attention problems compared with NCE adolescents at 12 and 15 years of age, controlling for the effects of other risk factors. Because a significant proportion of PCE adolescents in this sample was placed in non-kinship adoptive/foster care, we also explored the impact of nonkinship adoptive/foster care placement on behavior. Given previous findings, we also assessed gender as a potential moderator of PCE effects on behavioral outcomes [2,8,12,14].

Methods

Sample

This study included 371 (189 PCE and 182 NCE) adolescents recruited at birth from an urban county hospital with a high-risk maternal population screened for drug use. Pregnant women who lacked prenatal care, had a history of involvement with the Department of Human Services, exhibited behavior suggesting intoxication, or self-admitted drug use were considered to be at high risk for drug use and were given drug toxicology screenings at infant birth. Maternal and infant urine samples and infant meconium were obtained shortly before or after infant birth and analyzed for cocaine and other drug metabolites, including benzoylecgonine, meta-hydroxybenzoylecgonine, cocaethylene, cannabinoids, opiates, phencyclidine, amphetamines, and benzodiazepines. Women with a psychiatric history, low intellectual functioning (diagnosis of mental retardation indicated in medical

chart review), HIV-positive status, or chronic medical illness were excluded, as were infants with Down syndrome, fetal alcohol syndrome, or medical illness. A total of 415 newborns and their birth mothers were enrolled at birth, of which 218 infants were identified as cocaine exposed based on positive screens of maternal and infant urine, infant meconium, or maternal self-report to hospital or research staff. Infants exposed to cocaine were further classified as being either heavier or lighter exposed. The heavier PCE group was defined *a priori* as >70 th percentile for cocaine use, which corresponded to ≥ 216 ng/g benzoylecgonine in meconium screening or ≥ 17.5 units ("rocks" of cocaine worth \$20 each)/week in maternal self-report.

Since birth, 12 (9 PCE and 3 NCE) enrolled children died. Causes of death for the PCE children included sudden infant death syndrome (4), cardiopulmonary arrest (1), pneumonia (1), accidental asphyxia (1), respiratory distress syndrome (1), and unknown illness (1). For the NCE children, causes of death were sudden infant death syndrome (2) and respiratory distress syndrome (1). The present study utilizes data from 371 adolescents who completed behavioral assessment at ages 12 and/or 15 years, which represents 92% retention of the living participants. Among the 371 participating adolescents, 91.4% ($n = 339$) were assessed at both 12 and 15 years of age. Of the 32 adolescents not seen (19 dropout, 12 lost contact, 1 low intellectual functioning [$\text{IQ} < 50$]), the 20 PCE adolescents were more likely to have birth mothers with lower scores on the Wechsler Adult Intelligence Scale-Revised [29] Picture Completion subtest, and the 12 NCE adolescents not seen were more likely to be white and to have birth mothers who were older and married. No difference was found by PCE status between the 371 participants and the 32 nonparticipants.

Procedure

Adolescents and their caregivers were seen at the developmental research laboratory for approximately 5 hours at each follow-up visit at ages 6, 12, and 18 months and 2, 4, 6, 9, 10, 11, 12, and 15 years. All participants were given a monetary stipend, lunch, and transportation costs. This study was approved by the Institutional Review Board of the participating hospital. Parental written informed consent and child assent were obtained. A Certificate of Confidentiality (DA-98-91) was obtained from the Department of Health and Human Services.

At the newborn visit, birth mothers were asked to recall frequency and amount of drug use for the month prior to and for each trimester of pregnancy. The number of tobacco cigarettes and marijuana joints smoked and the number of drinks of beer, wine, or hard liquor per week were computed, with each drink equivalent to .5 oz. of absolute alcohol. For cocaine, as the majority of women ($>90\%$) in our study primarily used the crack cocaine form, the number of "rocks" consumed and the amount of money spent per day were noted and converted to a standard "unit" or "rock" of cocaine, referring to \$20 worth of cocaine. Frequency of use was recorded for each drug on a Likert-type scale ranging from 0 (not at all) to 7 (daily use) and converted to reflect the average number of days per week a drug was used, except for cigarettes, which was collected as the number smoked per day. Frequency was multiplied by the amount used per day to compute an average use score for the month prior to pregnancy and for each trimester. These scores were then averaged to obtain a total average score. The drug assessment was updated with the child's current caregiver at the 12 and 15 year follow-up visits to

Download English Version:

<https://daneshyari.com/en/article/10511662>

Download Persian Version:

<https://daneshyari.com/article/10511662>

[Daneshyari.com](https://daneshyari.com)