

OBSTETRICS

Maternal history of adoption or foster care placement in childhood: a risk factor for preterm birth

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OBJECTIVE: The objective of the study was to assess the impact of maternal history of adoption or foster care placement in childhood on the risk for preterm birth (PTB), controlling for other known risk factors for PTB.

STUDY DESIGN: Participants were 302 pregnant women from a low-income, diverse sample drawn from 2 intensive prospective studies of maternal mood and behavior and fetal and infant development. Gestational age was determined by best obstetric estimate. Maternal history of adoption or foster care placement prior to age 18 years was determined by maternal report. Other maternal characteristics, including maternal medical conditions, psychosocial characteristics, and health behaviors, were measured during the second and third trimesters of pregnancy.

RESULTS: The odds of delivering preterm (gestational age <37 weeks) were approximately 4 times greater among women with a

history of childhood adoption or foster care placement compared with women who were never placed out of the home during childhood. This association remained significant after adjusting for other known risk factors for PTB including maternal medical conditions, psychosocial characteristics, and negative health behaviors in pregnancy.

CONCLUSION: Findings suggest that a history of adoption/foster care placement is an important risk factor for PTB and may be comparable with other established risk factors for PTB including prior history of PTB, body mass index, African-American race, and advanced maternal age. More studies are needed to understand why women with placement histories may be at increased risk to deliver preterm.

Key words: adoption, early life stress, foster care, pregnancy, preterm birth

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Preterm birth (PTB) is a major public health problem. Twelve to eighteen percent of births in the United States are categorized as preterm.¹ PTB is the leading cause of infant morbidity and mortality in the United States²; 25% of neonatal deaths result from PTB.³ Furthermore,

preterm infants are at increased risk for numerous adverse outcomes in adulthood, including neurological problems, cardiovascular disease, respiratory problems, metabolic disorders, and infection.⁴ Care for preterm infants costs the United States \$26 billion annually.⁵

The etiology of PTB remains poorly understood,⁶ and rates of PTBs are rising in many industrialized countries.³ In the United States, the rates of PTB have increased from 9.5% in 1981 to 12.7% in 2007⁷ despite advancing knowledge regarding the risk factors for PTB and medical interventions designed to prevent PTB. Some risk factors for PTB that have been identified in past research include younger and advanced maternal age; minority race (rates of PTB in African-American women in the United States are 16-18% compared with 5-9% for white women⁸); single marital status; low socioeconomic status; prenatal stress; maternal depression and anxiety; interpersonal violence; low and high body mass index; and cigarette smoking in pregnancy.^{3,9-11}

Although the causal mechanisms linking maternal characteristics and PTB are largely unknown, previous researchers have proposed that as women experience a greater number of risk factors, the balance from uterine quiescence to preterm

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➤ See related editorial, page 317

labor is tipped, perhaps because of the influence of stressful experiences on inflammatory processes in the maternal-fetal-placental unit, leading to early labor onset.¹²

Emerging research has also shown increased rates of PTB in women with histories of stressful experiences (eg, child physical and sexual abuse) in their childhood.^{13,14} For example, women with a history of child sexual abuse were approximately 3 times more likely to deliver preterm compared with women without histories of child sexual abuse.¹³

Childhood out-of-home placement (ie, adoption or foster care) represents an extreme form of early-life stress because of caregiver separation and instability¹⁵ and is associated with a constellation of psychosocial and behavioral risk factors for PTB including lower socioeconomic position, emotional and behavioral difficulties, depression, and cigarette smoking.¹⁶⁻¹⁸ Therefore, there is reason to believe that childhood placement history may represent a risk factor for PTB. Furthermore, placement history could be assessed during preconception counseling and prenatal care appointments to improve risk profiles for PTB. However, no studies to date have investigated childhood adoption or foster care placement as a risk factor for PTB.

In this study we aimed to examine the association between maternal history of childhood placement and PTB in a low-income, racially/ethnically diverse sample of pregnant women, and to examine this association within the context of other maternal psychosocial and behavioral characteristics known to increase the risk for PTB.

MATERIALS AND METHODS

Participants

Participants were 302 women pooled from 2 prospective perinatal studies of maternal mood and behavior and fetal and infant development. Participants were excluded from participating in the larger studies if their pregnancies were complicated by multiple gestations or maternal age younger than 18 or older than 40 years.

The primary aim of one study was to examine the effects of maternal smoking on fetal and infant development (grant R01 DA019558) and thus oversampled for maternal smoking during pregnancy. The aim of the second study was to examine effects of maternal depression on fetal and infant development (grant R01 MH079153) and thus oversampled for depression during and prior to the current pregnancy. Maternal smoking and depression were examined as predictors of PTB in subsequent models. These studies were approved by Women and Infants and Lifespan Hospitals' institutional review boards. All women provided written consent prior to their participation. Study activities were conducted in the greater Providence, RI, region.

Procedure

As part of the larger studies, women were interviewed twice during the second and third trimesters of pregnancy (at approximately 27 [SD, 3.5] and 35 [SD, 1] weeks' gestation). At the first interview, women reported adverse childhood experiences, socioeconomic characteristics, health and pregnancy history, prepregnancy height and weight, cigarette smoking and alcohol use, symptoms of depression and anxiety, perceived stress, and sleep quality. At the second interview, women were again interviewed about substance use, symptoms of depression and anxiety, perceived stress, and sleep quality.

Socioeconomic status was assessed by maternal education (1, less than seventh grade, to 7, graduate training with degree) and annual household income (approximately \$10,000 increments from 1, <\$5000, to 8, \$100,000 or more). Participants reported their prepregnancy weight and height to compute their body mass index. Maternal medical conditions were assessed through medical chart review and maternal report and were summed for analyses.

Measures

Preterm birth

Gestational age at birth was defined as the number of days between the last menstrual period (collected by maternal

self-report) or ultrasound (confirmed by medical chart review) and date of delivery. If gestational age as measured by ultrasound after 14 weeks' gestation differed from the last menstrual period by ± 10 days, gestational age at birth was computed according to ultrasound calculations.¹⁹ Births were then categorized into those occurring prior to 37 weeks' gestation to indicate PTB status.³ One preterm birth resulted in fetal death.

Maternal history of adoption/foster care

At the first study session, participants were asked 2 questions to determine maternal history of adoption ("Were you adopted?" [yes/no]) or foster care placement ("Were you ever in foster care or an institution because your parents were unable to take care of you?" [yes/no]). Participants were considered to have a childhood placement history if they were ever adopted and/or in foster care prior to age 18 years.

Maternal history of childhood sexual and physical abuse

This was determined from items from the Adverse Childhood Experiences Scale.²⁰ Specifically, participants were asked how often, before the age of 18 years, they experienced child sexual abuse (4 items; eg, "How often did an adult person at least 5 years older than you touch or fondle your body in a sexual way?") or physical abuse (4 items; eg, "How often did a parent, stepparent, or adult living in your home push, grab, slap, or throw something at you?"). Response options ranged from 0 (never) to 4 (very often). We then created dichotomous childhood sexual abuse and childhood physical abuse variables based on whether participants endorsed a score of 1 or higher (eg, "once or twice") on relevant maltreatment items.

Psychosocial depression, anxiety, and stress

Symptoms of depression in the previous week was assessed using the Quick Inventory of Depressive Symptomatology.²¹ The Quick Inventory of Depressive

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