

MATERNAL HEALTH PRIOR TO PREGNANCY AND PRETERM BIRTH AMONG URBAN, LOW INCOME BLACK WOMEN IN BALTIMORE: THE BALTIMORE PRETERM BIRTH STUDY

Objectives: Black women have increased risk of preterm birth compared to White women, and overall Black women are in poorer health than White women. Recent recommendations to reduce preterm birth have focused on preconception health care. We explore the associations between indicators of maternal prepregnancy health with preterm birth among a sample of Black women.

Design: The current study was prospective.

Setting: Enrollment occurred in prenatal clinics in Baltimore.

Participants: Women (N=922) aged ≥ 18 were enrolled in the study. Data on maternal health, behaviors, and pregnancy outcome were abstracted from clinical records.

Main Outcome Measure: Logistic regression was used to evaluate associations between behavioral and health status variables with preterm birth.

Results: In bivariate analysis, alcohol use, drug use and chronic diseases were associated with preterm birth. In the logistic regression analysis, drug use and chronic diseases were associated with preterm birth.

Conclusions: These results demonstrate an association between maternal health and behaviors prior to pregnancy with preterm birth among Black women. Providing access to health care prior to pregnancy to address behavioral and health risks may improve pregnancy outcomes among low-income Black women. (*Ethn Dis.* 2012;22(1):85–89)

Key Words: Preterm Birth, Health Status, Pregnancy

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INTRODUCTION

Rates of preterm birth (birth <37 weeks completed gestation), currently 12.3 percent of all births, are higher now than in decades.¹ Currently, preterm births are substantially higher than in 1981, despite a recent drop from 2006–08.^{1,2} Since 1990, increases have been recorded in both very preterm births (<32 weeks completed gestation) and moderately preterm births (32–36 weeks).² The etiology of preterm birth is poorly understood, which hampers the development of successful prevention programs.³ Of particular concern is the long-standing Black:White racial disparity in preterm birth. Black women have double the risk of preterm birth compared to their White counterparts, and this disparity has been observed for decades.⁴ There is a need for research on factors associated with the etiology of preterm birth, especially those factors that might help to explain the high rates of preterm birth among Black women.

Recent recommendations by the March of Dimes⁵ and Centers for Disease Control and Prevention⁶ have suggested that the provision of preconception care may be a strategy to improve pregnancy outcomes and thus reduce preterm births. Misra et al⁷ and Haas et al⁸ have previously suggested that prenatal care may be provided too late to successfully intervene with many health and behavioral issues associated with preterm birth. However, it has not yet been shown conclusively that factors identified during the preconception period can be addressed so that preterm birth can be reduced, especially in Black women, the group at highest risk of preterm birth.

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factors are associated with preterm birth.⁸ They demonstrated that several health-related factors (eg, body thinness as indicated by low body mass index, hypertension, self-reported poor physical functioning, and smoking) were associated with preterm birth. However, their research had several limitations. The sample of women included in the study was relatively well-educated, mainly White and Latina, and in order to be included in the sample, a woman had to enroll in prenatal care prior to 16 weeks gestation and complete four telephone interviews. Thus, the results are not generalizable to many women at increased risk of poor pregnancy outcomes, such as low-income Black women or women who were not able to complete four telephone interviews. Also, their research included health status factors, such as pregnancy complications, which occurred during pregnancy, when it may be too late to intervene to improve pregnancy outcome. We only included health and behavioral factors that could be measured and addressed prior to pregnancy. We omitted factors that occurred during pregnancy such as

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bleeding or other complications since these are not amenable to intervention in the preconception period. The objective of our research was to determine if maternal health and behavioral factors that could be identified prior to pregnancy could help to explain risk of preterm birth among low-income, urban, Black women. This would suggest that preconception care could potentially be a way to address these problems and reduce risk of preterm birth.

METHODS

The research was conducted in Baltimore, Maryland, as part of the Baltimore Preterm Birth Study. Pregnant, Black women were identified at their first prenatal visit and were enrolled in this prospective study at four hospital-based clinics and one hospital-affiliated offsite clinic from 1993–95. All women aged ≥ 18 years who registered for a first prenatal visit at any of the five clinics were approached by a trained research assistant, who invited them to participate in the study and obtained informed consent. Participation among women seeking prenatal care at the clinics was $>95\%$. Each woman completed a questionnaire that included items to assess demographic data (eg, education, marital status, age).

Two trained abstractors obtained information on behavioral factors from the medical records of the women after the birth of the infants (1994–97). Information was collected about alcohol consumption, use of illicit drugs, and cigarette smoking. Underreporting of such behaviors during pregnancy is always of concern. However, the percentages of women who reported smoking and use of alcohol were similar to those reported in other studies.^{9,10} During the study period, as part of routine prenatal care, the participating clinics screened all women for use of illicit drugs, so more women in our study than in prior studies were found

to be users of illicit drugs. The abstractors also obtained data on prepregnancy health risks, including chronic diseases such as asthma, hypertension, or diabetes.

Finally, length of gestation was obtained from the clinical records of the women. The attending obstetrician made a best obstetric estimate of gestational age at the time of delivery based on date of the last menstrual period, prenatal ultrasound(s), fundal height, and when the fetal heart beat was first heard with a stethoscope. The customary cut-point of 37 weeks of gestation was used to define preterm birth.

Bivariate analysis of the relationship between each factor with preterm birth was conducted initially. Unadjusted odds ratios with 95% confidence intervals were calculated. Next, logistic regression analysis was used to evaluate the independent contribution of the behavioral and health status variables to preterm births.¹¹ Variables were included in the models if bivariate analyses suggested that they were associated with preterm birth. We also included maternal age and education to control for potential confounding by these demographic factors. The comparison category for the dependent variable was full term births. Odds ratios and 95% confidence intervals were estimated for each variable. Data were fairly complete overall, with less than 5 percent missing data for study variables.

RESULTS

Approximately 20% of the women enrolled in the study were excluded post-enrollment for reasons including pregnancy loss, multiple pregnancy, missing medical record, or having moved from the area. The analysis sample consisted of 922 Black women.

The median number of weeks gestation for starting prenatal care was 14. Forty-four percent of the women

started prenatal care in the first trimester, and approximately 85% started care during the first or second trimester.

The behavioral, clinical, and demographic characteristics of the 922 women in the sample are shown in Table 1. Approximately 8% drank alcohol; about 16% used illicit drugs; and about one-quarter of the women smoked cigarettes during pregnancy. For health risks prior to pregnancy, approximately 30% had a chronic disease. The demographic characteristics of the women were: 24% aged 18–19 years (mean=23.69, median=22); about 28% had less than a high school education; and about 28% were married or living with a partner. Among the women in the sample, 126 experienced a preterm birth (13.7%).

Table 2 displays the unadjusted odds ratios. Overall, in bivariate analyses, mothers with behavioral or clinical risks tended to have higher unadjusted odds of preterm births. Alcohol use, drug use and smoking were all significantly associated with preterm birth as was chronic disease.

As shown in Table 3, in the logistic regression model, the following variables were significantly associated with preterm birth: chronic disease (OR=1.60, 95% CI: 1.07, 2.40) and drug use (OR=2.01, 95% CI: 1.11, 3.62). Neither smoking nor alcohol consumption were associated with preterm birth in the regression model, which is consistent with other findings.¹²

DISCUSSION

In this sample of low-income, urban, Black women, factors (use of illicit drugs and chronic diseases) that could be identified during the preconception period were associated with preterm birth. The burden of many health problems in this sample of low-income Black women was quite high. More than one-quarter had a chronic disease. In addition, close to one-quarter of the women smoked cigarettes (a

Table 1. Behavioral, clinical, and demographic characteristics of the sample, Baltimore Preterm Birth Study, 1993–97

Variables	n	%
Behavioral		
Alcohol Use		
Yes	73	7.9
No	848	92.1
Missing	1	
Drug Use		
Yes	147	16.0
No	771	84.0
Missing	4	
Smoking		
Yes	213	23.1
No	709	76.9
Physical Health		
Chronic disease(s)		
Yes	265	29.1
No	645	70.9
Missing	12	
Demographic		
Age, years		
18–19	225	24.4
≥20	696	75.6
Missing	1	
Education		
<High school graduate	255	27.7
≥High school graduate	664	72.3
Missing	3	
Marital status		
Married or living with partner	252	27.5
Not married or living with partner	665	72.5
Missing	5	

much higher percentage than would be expected from national data from that time period),¹³ 8% used alcohol, and 16% used illicit drugs.

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prior to pregnancy increase the risk among low-income Black women for preterm outcomes. These findings have implications for policies and financing related to health care for women of reproductive age. Providing access to regular health care for low-income women, to address health problems prior to conception and pregnancy, may help to reduce poor pregnancy outcomes. The emphasis in the United States on providing prenatal care, but not other health care services, to low-income women is likely to be insufficient to improve preterm outcomes. Improvements in prenatal care in the United States in prior decades have not been followed by reductions in preterm birth.⁷ It may be too late once a woman has become pregnant and seeks prenatal

care to adequately intervene with health problems (eg, chronic diseases) and behavioral risks (eg, drug use) in order to prevent preterm outcomes.^{7,8} The March of Dimes suggests that opportunities to intervene with women prior to pregnancy may be found during health care visits for negative pregnancy tests, following a poor pregnancy outcome, during family planning visits, and visits for postpartum care.⁵

Our findings are consistent with Geronimus' proposition¹⁴ that the high burden of health problems among Black women in the United States contributes to their increased risk of preterm birth outcomes. Black women report poorer overall health and functional status compared to White women, and also have increased mortality from most major causes of death, decreased life expectancy, and increased premature mortality.¹⁵ Black women also have much higher rates of maternal mortality than their White counterparts.¹⁵ Viewed within the context of overall health problems, the increased risk of Black women for preterm outcomes is not surprising. Increased risk of preterm birth outcomes is part of an overall picture of diminished health, premature mortality, and Black:White disparities in women's health in the United States.

Developing policies and financing strategies to improve access to routine health care among women of reproductive age may lead to a reduction in preterm birth among Black women and an improvement in their overall health status. Many women of childbearing age lack access to a regular source of health care, which would be a prerequisite to providing preconception care. Many of the same circumstances that increase risk of preterm birth (eg, chronic diseases, use of illicit drugs) also increase risk of poor overall health and premature death. Policies and programs directed at improving health of reproductive age women in order to improve pregnancy outcomes may also lead to improved indicators of population

Table 2. Unadjusted bivariate associations between behavioral, clinical, and demographic variables with preterm birth, Baltimore Preterm Birth Study, 1993–97

Variable	% Preterm	Unadjusted OR (95% CI)
Age, years		
18–19	11.1	1.36 (.85, 2.1)
≥20	14.5	
Education		
<HS grad	15.7	1.27 (.84, 1.90)
≥HS grad	12.8	
Marital status		
Not married	13.5	1.02 (.67, 1.56)
Married/live with	13.7	
Alcohol use		
Yes	21.9	1.88 (1.04, 3.40)
No	13.0	
Drug use		
Yes	22.4	2.11 (1.35, 3.29)
No	12.1	
Smoking		
Yes	19.2	1.75 (1.16, 2.63)
No	12.0	
Chronic disease(s)		
Yes	17.4	1.53 (1.03, 2.26)
No	12.1	

health such as life expectancy and premature deaths from chronic diseases. These improvements may be especially notable for Black women, who have

marked disadvantages in these indicators compared to White women. Public policy should be directed towards improving women’s health as a means

Table 3. Logistic regression model for preterm births, Baltimore Preterm Birth Study, 1993–97

Variables	Odds ratio	95% CI
Alcohol use		
Yes	1.24	(.63, 2.45)
No		
Drug use		
Yes	2.01	(1.11, 3.62)
No		
Smoking		
Yes	1.09	(.63, 1.88)
No		
Chronic disease		
Yes	1.60	(1.07, 2.40)
No		
Maternal age, years		
18–19	1.21	(.73, 2.00)
≥20		
Maternal education		
<12 years	1.16	(.75, 1.79)
≥12 years		

of improving pregnancy outcomes and other indicators of population health.

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