ARKANSAS PRAMS UPDATE

PREGNANCY RISK ASSESSMENT MONITORING SYSTEM VOL 1 NO 1 SUMMER 2007

Disparities in Low Birthweight Babies Born to Black and White Women

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Background: Low birthweight is one of the leading causes of infant mortality and increases the risk for developmental disabilities. In Arkansas, black women are twice as likely as white women to have a low birthweight infant. This disparity may exist because black women (74%) are much more likely than white women (46.3%) to have unintended pregnancies (mistimed or unwanted). Women who have unintended pregnancies are more likely to engage in personal risk behaviors that can affect the health of their infants.

Objective: To determine if having an unintended pregnancy increases the risk of having a low birthweight infant.

Study Design: Data from the Arkansas PRAMS survey for the years 1998-2005 were used.

Measurement: Pregnancy intent was measured by how women responded to the question, "Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" A mistimed or unwanted pregnancy is considered to be unintended.

Key Findings: 1) Unintended pregnancies were not associated with low birthweight. 2) For white women, smoking and medical risk factors (e.g., hypertension, diabetes) were the strongest indicators of a low birthweight infant. Medical risk factors and no prenatal care were the strongest indicators for black women.

Limitations: Recall bias. A woman may recall her pregnancy intention differently based on the outcome of her pregnancy.

Conclusions: Emphasis should be placed on preconception care programs to control or eliminate the prevalence of medical risk factors for women that can produce poor pregnancy outcomes. Research is needed to analyze the availability and accessibility of prenatal care for all women in Arkansas.

Introduction

Low birthweight (less than 2,500 grams) is one of the leading causes of infant mortality, and low birthweight infants who survive are at an increased risk of having developmental disabilities.[1]

In Arkansas, there is a significant disparity in the proportion of low birthweight infants born to black and white women. Arkansas PRAMS data show that black women are twice as likely as white women to deliver a low birthweight baby. One of the goals of *Healthy People 2010* is to eliminate health disparities, and one of the *Healthy People 2010* objectives (16-1c) is to reduce the prevalence of low birthweight infants to 5%.[2] Eliminating or reducing this significant disparity in Arkansas requires an understanding of the factors related to low infant birthweight and how they are similar or different for black and white women.

One of these factors may be whether the pregnancy was unintended (mistimed or unwanted). Previous studies have found that unintended pregnancies may be related to poor birth outcomes like low birthweight, because women who have unintended pregnancies are more likely to engage in risky behaviors during their pregnancy that can affect the health of their babies. For example, women who have unintended pregnancies are more likely to smoke, more likely to receive delayed or no prenatal care, and are less likely to report daily vitamin use.[3,4] In Arkansas, black women are much more likely than white women to have an unintended pregnancy. This fact may in part explain the higher proportion of low birthweight babies born to black women.

The purpose of this Arkansas PRAMS Update is to examine the characteristics of black and white women who had intended, mistimed, or unwanted pregnancies and to determine if women who had mistimed or unwanted pregnancies are at a higher

risk of delivering a low birthweight infant than women who had intended pregnancies.

Methods

This study used data from the Arkansas Pregnancy Risk Assessment Monitoring System (PRAMS) for the years 1998 to 2005. During this period, 15,857 of the 20,985 PRAMS surveys mailed to new mothers were completed for an unweighted response rate of 75.5%. Because of the small number of respondents from other races, only white and black women were included. Multiple births and missing observations for the pregnancy intent question were excluded. The final sample size was 13,446.

Pregnancy intention was assessed by the Arkansas PRAMS question "Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" Women who responded "I wanted to be pregnant sooner" or "I wanted to be pregnant then" were categorized as having an intended pregnancy. Women who responded "I wanted to be pregnant later" were categorized as having a mistimed pregnancy. Women who responded "I didn't want to be pregnant then or at any time in the future" were categorized as having an unwanted pregnancy.

The outcome variable was dichotomized as low birthweight or normal birthweight. The reference variable was normal birthweight.

Other independent variables assessed from PRAMS were Medicaid status, prepregnancy body mass index (BMI, defined as kg/m^2), smoking in the 3rd trimester, receipt of prenatal care, and physical abuse. A woman was defined as receiving Medicaid if she reported that she had received Medicaid benefits just before her pregnancy or that Medicaid had paid for her prenatal care or delivery. Prepregnancy BMI was calculated based on self-report of prepregnancy height and weight. Centers for Disease Control and Prevention (CDC) definitions were used to categorize prepregnancy BMI as underweight (BMI <18.5), normal weight (18.5-24.9), overweight (25.0-29.9), or obese (≥30.0). Smoking during the 3rd trimester was defined as any cigarette smoking during that time period. Delayed or no prenatal care was defined as beginning prenatal care after the 1st trimester or not receiving any prenatal care. Physical abuse was defined as being pushed, hit, slapped, kicked, or otherwise physically hurt by a husband or partner at any time before or during pregnancy.

Birth certificate data assessed as independent variables were maternal age, maternal race, maternal education, marital status, parity, medical risk factors (e.g. diabetes, chronic hypertension, etc.), and infant birthweight.

For the descriptive analysis, variables were examined using weighted percentages and 95% confidence intervals (CIs). Chi-square tests of significance were used to assess differences in characteristics across pregnancy intent groups. Backward stepwise logistic regression modeling with SAS PROC SURVEYLOGISTIC and a finite population correction was performed to produce adjusted odds ratios (AORs) as measures of association between pregnancy intent, selected independent variables, and low birthweight. In the first stage of analysis, all selected variables, including maternal race (white, black) were entered into a logistic regression model for low birthweight. Variables that were significant at $p<0.15$ were then used in separate second stage models for white and black women. Physical abuse was the only variable that was not significantly related to low birthweight; therefore it was not included in separate models for white and black women. Relationships between model variables and low birthweight in second stage models were considered significant at $p<0.05$.

Results

Descriptive analysis

Overall, for the period 1998 to 2005, 52.0% of all women reported unintended pregnancies, 37.8% had mistimed pregnancies, and 14.2% had unwanted pregnancies. Among white women, 53.7% had intended pregnancies, 35.5% reported mistimed pregnancies, and 10.8% reported unwanted pregnancies. Among black women, only 26.1% had intended pregnancies, 46.4% reported mistimed pregnancies, and 27.5% reported unwanted pregnancies (Table 1).

TABLE 1: MATERNAL CHARACTERISTICS BY RACE AND PREGNANCY INTENTION (1998-2005)

	White				Black			
Characteristics	Total	Intended	Mistimed	Unwanted	Total	Intended	Mistimed	Unwanted
Overall	100.0	53.7	35.5	10.8	100.0	26.1	46.4	27.5
Age								
<20	**14.6**	8.5	24.5*	12.7*	**26.1**	13.1	35.5*	22.7±
20-24	**32.1**	27.0	40.1	30.7	**39.3**	38.1	40.8	37.6
25-34	**46.7**	56.2	33.0	45.0	**30.4**	39.3	23.0	34.5
>=35	**6.6**	8.3	2.4	11.6	**4.2**	9.5	0.7	5.2
Education								
<12	**16.4**	1.7	20.9*	24.5*	**24.1**	17.7	26.0±	26.9*
12	**40.2**	36.1	45.4	43.8	**49.1**	48.2	48.4	51.2
>12	**43.4**	52.2	33.7	31.7	**26.8**	34.1	25.6	21.9
Married								
No	**25.9**	12.8	39.7*	45.1*	**77.5**	58.1	84.3*	84.4*
Yes	**74.1**	87.2	60.3	54.9	**22.5**	41.9	15.7	15.6
Medicaid								
No	**53.8**	66.0	40.1*	38.0*	**16.9**	26.7	13.1*	14.0*
Yes	**46.2**	34.0	59.9	62.0	**83.1**	73.3	86.9	86.0
Parity								
0	**42.9**	44.4	47.1	22.4*	**40.8**	36.6	49.8*	29.4±
1-2	**49.9**	50.1	46.8	58.9	**46.1**	50.6	42.0	49.0
≥3	**7.2**	5.5	6.1	18.7	**13.1**	12.8	8.2	21.6
Prepregnancy BMI								
Underweightt	**1.2**	9.9	12.7*	13.4	**12.9**	12.3	12.5±	14.3
Normal weight	**49.8**	49.1	50.8	49.7	**41.2**	35.5	46.4	37.9
Overweight	**20.8**	21.5	20.3	18.7	**22.5**	22.9	21.2	24.2
Obese	**18.2**	19.5	16.2	18.2	**23.4**	29.6	19.9	23.6
Medical risk factors								
No	**77.3**	77.3	78.1	75.0	**76.2**	71.5	79.0	76.0
Yes	**22.7**	22.7	21.9	25.0	**23.8**	28.5	21.0±	24.0
Smoking								
No	**75.2**	81.2	71.7	58.8	**89.7**	89.5	90.6	88.2
Yes	**24.8**	18.8	28.3*	41.2*	**10.3**	10.5	9.4	11.8
Prenatal care								
None	**1.1**	0.7	1.0*	3.2*	**2.8**	1.8	2.2±	4.8*
Delayed	**23.4**	16.0	30.0	38.3	**35.6**	25.7	36.5	43.7
1st trimester	**75.5**	83.3	69.0	58.5	**61.6**	72.5	61.3	51.5
Physical abuse								
No	**95.0**	96.6	93.5	89.0	**92.0**	91.8	92.4	87.7
Yes	**5.0**	3.4	6.5*	11.0*	**9.0**	8.2	7.6	12.3
Low birthweight								
No	**94.2**	94.5	94.2	92.6	**87.8**	87.0	88.7	87.8
Yes	**5.8**	5.5	5.8	7.4*	**12.0**	13.0	11.3	12.2

* $p < 0.001$ compared with intended pregnancies
± $p < 0.05$ compared with intended pregnancies

Table 1 presents differences and similarities in characteristics of women who had intended, mistimed, and unwanted pregnancies. Both black and white women who had unintended pregnancies were more likely to be young, have 12 years of education or less, to be unmarried, have received Medicaid, have had more than one previous birth, and have received delayed or no prenatal care. White women who had unintended pregnancies were more likely to smoke during their 3rd trimester and have been physically abused compared to women with intended pregnancies. Black women who had mistimed pregnancies were more likely to have medical risk factors compared to those who had intended pregnancies.

Approximately 6% of white mothers delivered a low birthweight infant, compared to 12% of black mothers. 5.5% of white women with intended pregnancies, 5.8% with mistimed pregnancies, and 7.4% with unwanted pregnancies had low birthweight infants. For black women, 13.0% with intended pregnancies, 11.3% with mistimed pregnancies, and 12.2% with unwanted pregnancies had low birthweight infants. There is no difference in infant birthweight across the pregnancy intent groups for black women; however, low infant birthweight is higher for white women who had unwanted pregnancies.

Logistic Regression Analysis

Table 2 presents the regression model, which includes those variables found by backward stepwise logistic regression to be significantly related to low birthweight.

After adjustment for selected independent variables, mistimed and unwanted pregnancies were not associated with low infant birthweight for either race group. This finding is consistent with other studies of pregnancy intent and adverse birth outcomes.[5]

For white women, advanced maternal age, low levels of education, Medicaid coverage, low prepregnancy BMI, medical risk factors, and smoking during pregnancy increased the risk of low infant birthweight. Factors found to increase the risk of low infant birthweight for black women included smoking during pregnancy, having medical risk factors, and not receiving any prenatal care.

For white women, those who were 35 years of age

TABLE 2: REGRESSION MODEL OF LOW BIRTHWEIGHT

	WHITE	BLACK
	AOR (95% CI)	AOR (95% CI)
Pregnancy Intent		
Intended	1.00	1.00
Mistimed	0.91 (0.81-1.02)	0.82 (0.65-1.02)
Unwanted	1.04 (0.88-1.22)	0.86 (0.67-1.11)
Age		
<20	0.92 (0.76-1.11)	0.83 (0.60-1.14)
20-24	1.02 (0.90-1.15)	0.89 (0.70-1.12)
25-34	1.00	1.00
>=35	1.52 (1.25-1.83)	1.28 (0.78-2.12)
Education		
<12	1.45 (1.23-1.72)	1.19 (0.89-1.58)
12	1.18 (1.05-1.32)	1.15 (0.92-1.43)
>12	1.00	1.00
Married		
No	1.14 (1.00-1.29)	1.20 (0.93-1.56)
Yes	1.00	1.00
Medicaid coverage		
No	1.00	1.00
Yes	1.15 (1.02-1.30)	0.90 (0.68-1.19)
Parity		
0	1.00	1.00
1 to 2	0.62 (0.56-0.69)	0.74 (0.60-0.91)
>=3	0.70 (0.57-0.86)	0.79 (0.57-1.11)
Prepregnancy BMI		
Underweight	1.35 (1.17-1.57)	1.11 (0.84-1.48)
Normal weight	1.00	1.00
Overweight	0.80 (0.70-0.90)	0.85 (0.68-1.07)
Obese	0.85 (0.74-0.97)	0.70 (0.55-0.88)
Medical risk factors		
No	1.00	1.00
Yes	2.35 (2.12-2.61)	1.93 (1.59-2.36)
Smoking		
No	1.00	1.00
Yes	1.85 (1.65-2.06)	1.68 (1.26-2.24)
Received prenatal care		
None	1.42 (0.81-2.48)	1.86 (1.08-3.20)
Delayed	0.98 (0.87-1.10)	1.13 (0.93-1.37)
First trimester	1.00	1.00

or older were 1.5 times more likely than younger white women to deliver a low birthweight infant. White women who had less than 12 years of education were 1.5 times more likely to deliver a low birthweight infant than those who had more than 12 years of education. Those white women who received Medicaid were 1.2 times more likely to deliver a low birthweight infant compared to white women who had not received Medicaid. Women who were underweight before pregnancy were 1.4 times more likely to deliver a low birthweight infant compared to women who were of normal weight. Having one or more previous births and being overweight or obese before pregnancy decreased the likelihood of delivering a low birthweight infant. The strongest indicators for low birthweight babies for white women were medical risk factors and smoking. White women who had medical risk factors and who smoked were 2.4 times and 1.9 times more likely to deliver a low birthweight infant compared to those without these risk factors.

Black women who had one or two previous births and were obese before pregnancy were less likely to deliver a low birthweight infant compared to black women with no previous births or of normal weight before pregnancy. Black women who smoked were 1.7 times more likely to deliver a low birthweight infant compared to those who did not smoke. For black women, the strongest indicators for low birthweight were medical risk factors and no receipt of prenatal care. Those black women who had medical risk factors and who did not receive prenatal care were 1.9 times more likely to deliver a low birthweight infant compared to black women who had no medical risk factors or received prenatal care. None of the sociodemographic variables were significantly associated with low infant birthweight for black women.

Discussion

Neither mistimed nor unwanted pregnancies were found to be associated with low infant birthweight for black or white women in Arkansas. Pregnancy intent may just be a risk marker for other variables that influence pregnancy outcomes, such as delayed prenatal care or smoking during pregnancy.[5]

Are there differences in the factors associated with low infant birthweight for black and white women? Yes and no. Sociodemographic characteristics (e.g., age, education, and Medicaid coverage) were significant factors for white women but not for black women. However, medical risk factors and smoking were found to be significant factors for both black and white women.

It is important to note that smoking and medical risk factors were the strongest indicators of low infant birthweight for white women. Similarly, medical risk factors and smoking, as well as no receipt of prenatal care, were strong indicators for black women. These findings have implications for smoking cessation programs targeted toward all women in Arkansas.

Smoking is the most modifiable risk factor to prevent low infant birthweight. During 1998-2005, approximately 25% of pregnant white women and slightly over 10% of pregnant black women in Arkansas smoked during their third trimester. The *Healthy People 2010* objective (16-17c) is that only 1% of women smoke during their pregnancies.[2] It is especially important to note that smoking rates for pregnant women closely resemble those for all women of childbearing age in the state. According to data from the 2005 Arkansas Behavioral Risk Factor Surveillance System (BRFSS) survey, almost 27.0% of all women, 29.7% of white women, and 16.9% of black women of childbearing age (18-44 years) smoke. (The 15-44 year old age category is used for women of childbearing age; however BRFSS only surveys persons 18 and older.) For comparison, the *Healthy People 2010* objective (27-1a) is to reduce smoking rates for adults to just 12.0%.

In Arkansas, emphasis should be placed on programs that promote preconception care to assure women are healthy for pregnancy.

Limitations

The main limitation of this study is recall bias. A woman may recall her pregnancy intention differently based on the outcome of her pregnancy.

References

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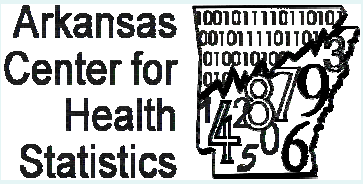

WHAT IS PRAMS?

The Pregnancy Risk Assessment Monitoring System is an on-going, population-based surveillance system, sponsored by the Centers for Disease Control and Prevention. It is designed to capture maternal behaviors and experiences that occur before, during, and after pregnancy among women who had a live birth. Over 200 recent mothers are sampled from Arkansas birth certificates each month and stratified by birthweight and population density. Mothers are mailed as many as three questionnaires seeking participation, with follow-up phone interviews for non-respondents. Responses are weighted to adjust for sample design, non-coverage, and non-response.