MARYLAND PRAMS
Pregnancy Risk Assessment Monitoring System

Focus on

Hypertension during Pregnancy

Among Maryland Women Giving Birth 2004-2010

March 2012

"A major contributing factor to prematurity is preterm preeclampsia or eclampsia and related hypertensive complications of pregnancy that frequently require very early delivery."

James Martin, M.D. President, American College of Obstetricians and Gynecologists, 2011

Hypertension during pregnancy may be pre-existing (chronic) or may start in the 2nd half of pregnancy (gestational hypertension). When protein is in the urine with gestational hypertension, it is known as preeclampsia. This is more serious and can complicate chronic hypertension.

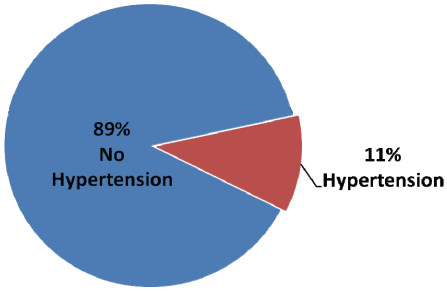
Hypertension during pregnancy is associated with many adverse pregnancy outcomes including maternal stroke, seizure (eclampsia), heart or renal failure, abruption, fetal growth restriction and even perinatal death. These adverse effects are common indications for preterm delivery.

Prevalence of Hypertension during Pregnancy

The 2004 – 2010 Maryland PRAMS survey included the following question:

Did you have any of these problems during your most recent pregnancy?
High blood pressure, hypertension (including pregnancy-induced hypertension [PIH], preeclampsia, or toxemia)

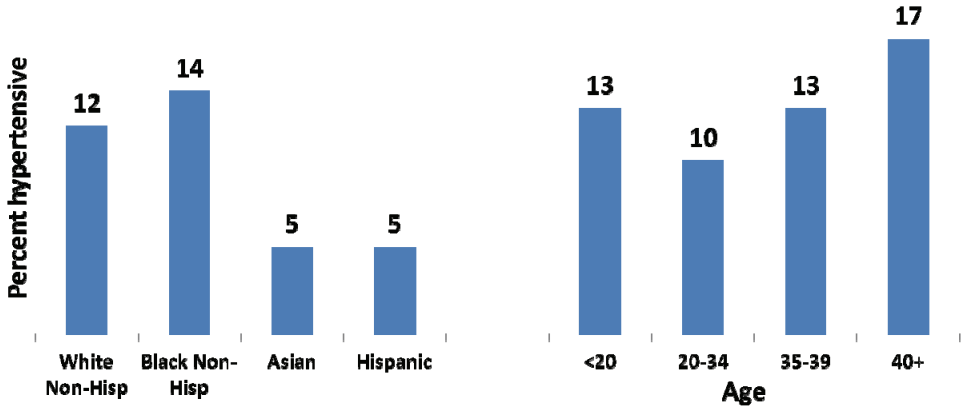
Figure 1. Prevalence of Maternal Hypertension during Pregnancy, Maryland 2004-2010



From 2004–2010, 11% of mothers in Maryland who had recently given birth had hypertension during pregnancy (Figure 1). Eighteen percent of these women reported that they were also hypertensive during the three months just before pregnancy (data not shown).

Hypertension was most prevalent among women who were 40 years of age or more at the time of delivery (17% were hypertensive) or Black Non-Hispanic (14%)(Figure 2). The prevalence of hypertension did not vary significantly by type of health insurance coverage (data not shown).

Figure 2. Hypertension during Pregnancy by Maternal Race/Ethnicity and Age, Maryland 2004-2010



Factors Associated with Hypertension during Pregnancy

Multiple Gestation

Hypertension during pregnancy was more prevalent among women with multiple gestations than singleton gestations. Thirty-seven percent of women who were having triplet or higher gestations reported hypertension during pregnancy. They were over three times more likely to report being hypertensive during pregnancy than women with singleton gestations (11%) (Figure 3).

Figure 3. Prevalence of Maternal Hypertension during Pregnancy by Multiple Gestation, Maryland 2004-2010

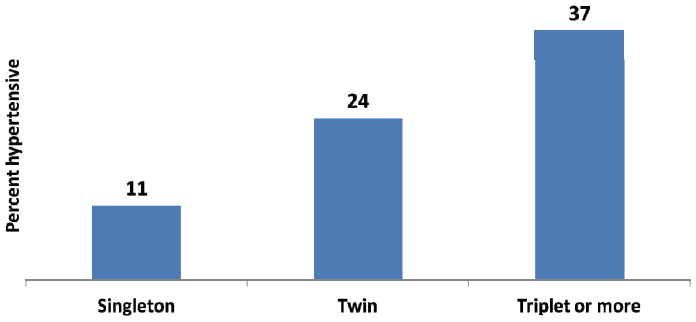


Table 1. Factors Associated with Hypertension During Pregnancy, Maryland 2004-2010, (N=2006)

Factor	Hypertensive %
Before Pregnancy	
Body Mass Index (BMI)	
<18.5, underweight	6
18.5-24.9, normal weight	7
25-29.9, overweight	14
30 and +, obese	20
Chronic hypertension—yes	65
Chronic hypertension—no	9
Chronic diabetes—yes	27
Chronic diabetes—no	11
Less than daily folic acid consumption	11
Daily folic acid consumption	11
Cigarette smoking, 3 months pre-pregnancy—yes	13
Cigarette smoking, 3 months pre-pregnancy—no	11
Binge drinking, 3 months pre-pregnancy—yes	12
Binge drinking, 3 months pre-pregnancy—no	11
Unintended pregnancy	12
Intended pregnancy	11
Physical abuse by current or former partner—yes	14
Physical abuse by current or former partner—no	11
During Pregnancy	
Initiation of care, 3rd trimester or no care	9
Initiation of care, 1st trimester	11
Gestational diabetes—yes	20
Gestational diabetes—no	10
Cigarette smoking, last 3 months—yes	12
Cigarette smoking, last 3 months—no	10
Binge drinking, last 3 months—yes	11
Binge drinking, last 3 months—no	11
Alcohol use, last 3 months—yes	9
Alcohol use, last 3 months—no	11
Physical abuse by current or former partner—yes	15
Physical abuse by current of former partner—no	11

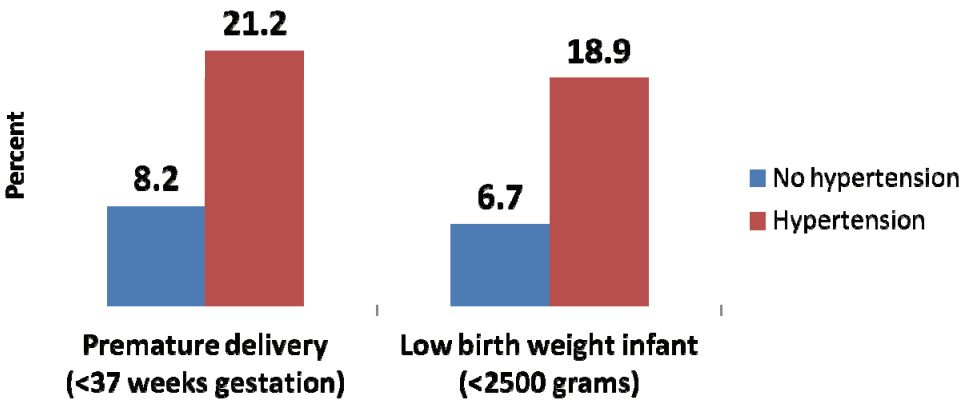
The highest rates of hypertensive disorders during pregnancy were reported by women who stated that they were hypertensive before pregnancy (65% were hypertensive during pregnancy), diabetic before pregnancy (27%), had an obese BMI before pregnancy (20%), had gestational diabetes (20%) and were physically abused by a current or former partner during pregnancy (15%).

Caeserean section

The primary caesarean section rate among women who reported hypertension during pregnancy was 33% - a significantly higher rate than among women who were not hypertensive during pregnancy (19%) (data not shown).

Birth Outcomes

Figure 4. Prevalence of Prematurity and Infant Low Birth Weight by Hypertension during Pregnancy, Maryland 2004-2010



"My baby weighed only 2 lbs. after an emergency c-section was done because I had a seizure due to high blood pressure. I had to stay in the hospital 2 weeks which was horrible. "

Approximately one out of every five women with hypertension during pregnancy experienced a premature delivery (21%) or delivery of a low birth weight infant (19%). These rates were 2.5-3 times higher than rates among mothers who did not have hypertension (Figure 4).

Discussion

The effects of hypertension during pregnancy can range from mild to serious. Preeclampsia or "toxemia" is a serious hypertensive disorder during pregnancy that can lead to complications of the placenta and the mother's kidney, liver and brain. Preeclampsia typically starts during the 2nd half of pregnancy and is accompanied by protein in the mother's urine due to problems with the kidney. Premature delivery is frequently necessary to prevent further complications from arising. When preeclampsia causes seizures, the condition is known as eclampsia and it is a leading cause of maternal death in the U.S.

Hypertensive disorders during pregnancy were reported by 11% of pregnant women, and has far-reaching consequences for the health of women, as well as the health of their infants. Hypertension is more common among mothers who are 40 years of age or more at the time of delivery (17% were hypertensive), less than 20 years of age (13%), or Black Non-Hispanic (14%). Factors such as multiple pregnancy greatly increase the risk of hypertension. Mothers with a triplet gestation are over three times more likely to become hypertensive than mothers with a singleton gestation. Other factors such as chronic hypertension, chronic or gestational diabetes, obesity, and intimate partner abuse are also associated with increased prevalence of hypertension during pregnancy.

"They induced my labor early because my blood pressure went up and my kidneys were going to shut down ."

"...they sent me to another hospital because of my high blood pressure."

PRAMS Mothers

PRAMS Methodology

Data included in this report were collected through the Pregnancy Risk Assessment Monitoring System (PRAMS), a surveillance system established by the Centers for Disease Control and Prevention (CDC) to obtain information about maternal behaviors and experiences that may be associated with adverse pregnancy outcomes.

In Maryland, the collection of PRAMS data is a collaborative effort of the Department of Health and Mental Hygiene and the CDC. Each month, a sample of 200 Maryland women who have recently delivered live born infants are surveyed by mail or by telephone, and responses are weighted to make the results representative of all Maryland births.

This report is based on the responses of 10,915 Maryland mothers who delivered live infants between January 1, 2004 and December 31, 2010 and were surveyed two to nine months after delivery.

Limitations of Report

This report has several limitations. First, hypertension was not determined through a clinical diagnosis, but instead through mothers' self-reports. Self-report may overestimate or underestimate the true incidence of hypertension during pregnancy in Maryland. Whether the hypertension was treated was not ascertained nor was the severity of the hypertension. It was also not possible to distinguish between gestational hypertension, chronic hypertension and pre-eclampsia. Older maternal age was a significant risk factor for hypertensive disorders during pregnancy and this may have lessened the impact of other risk factors that were more common in younger women such as smoking. On the other hand, pre-eclampsia is more common among women during their first pregnancies (usually a younger age group) making the impact of age complex. Additionally, since this is a retrospective survey there may be recall bias. That is, women who experienced hypertension during pregnancy may over-report negative factors, while women who did not experience hypertension may under-report negative factors. Lastly, this report presents unadjusted associations between risk factors and hypertension, and as a result causal relationships cannot be determined.

Resources

The Preeclampsia Foundation
www.preeclampsia.org

Production Team:
Diana Cheng, MD
Sara Barra, MS

For further information, please contact:

Diana Cheng, M.D.
PRAMS Project Director
Medical Director, Women's Health
Center for Maternal and Child Health
Maryland Department of Health and Mental Hygiene
201 W. Preston Street, Room 309
Baltimore, MD 21201

Phone: (410) 767-6713
Fax: (410) 333-5233

or visit:

www.marylandprams.org

Maryland Department of Health and Mental Hygiene
Center for Maternal and Child Health • Vital Statistics Administration

Martin O'Malley, Governor; Anthony G. Brown, Lieutenant Governor; Joshua M. Sharfstein, M.D. , Secretary

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