7th Annual Women's Heart & Vascular Symposium

Hypertension and Pregnancy

Carol Lai, MD
Stephanie A. Coulter, MD
Amy Woodruff, MD

Hypertensive disorders complicate up to 10% of pregnancies in the United States and are responsible for 10% to 15% of all U.S. maternal deaths.[1] In 0.5% to 3% of hypertensive pregnant women, the diagnosis is chronic hypertension.[2]

Circulatory changes begin early in pregnancy. Systemic vascular resistance declines, resulting in increased stroke volume and cardiac output. Despite this, systolic blood pressure (BP) remains relatively unchanged. Conversely, diastolic BP has a bimodal trend. It decreases an average of 10 mmHg in the 2nd trimester consequent to decreased systemic vascular resistance, then returns to pre-pregnancy levels during the 3rd trimester because of the increased blood volume and stroke volume.[3]

Hypertensive disorders of pregnancy can be classified into 4 categories: gestational hypertension, preeclampsia-eclampsia, chronic hypertension, and preeclampsia superimposed upon underlying hypertension.[4] Diagnosis generally depends on gestational age at the time of presentation. Distinguishing preeclampsia from other causes of hypertension can be difficult but is essential to maternal and fetal outcomes.[5]

Gestational hypertension is defined as a systolic BP >140 mmHg or a diastolic BP >90 mmHg, with no proteinuria. In addition, the hypertension must have developed after 20 weeks of gestation. The prognosis is good for both maternal and fetal outcomes.[5]

Preeclampsia is defined as a BP >140/90 mmHg, with proteinuria >0.3 g in a 24-hour urine collection; or as organ dysfunction defined by a platelet count <100,000/mm^3, a creatinine level >1.1 mg/dL, transaminitis, congestive heart failure, or neurologic symptoms.[5] The cause is poorly understood. Immunologic and genetic factors might lead to systemic endothelial dysfunction, and circulation abnormalities might result in hypoperfusion, hypoxemia, and ischemia of the placenta. Risk factors include first pregnancy, multiple pregnancies, obesity, pregestational diabetes mellitus, a history of chronic hypertension, and a family history of mothers with preeclampsia. Preeclampsia can have early or late onset. Late-onset preeclampsia (prevalence, 5% of cases) occurs within 48 hours after delivery. The early-onset condition (<34 wk of gestation) tends to be more severe. Definitive therapy is delivery; however, conservative management may be pursued in selected cases, particularly if the condition occurs early in gestation (thus enabling maximal time for the fetus to mature).[5]

Patients with mild-to-moderate hypertension, defined as a systolic BP of 140 to 150 mmHg and a diastolic BP of 90 to 100 mmHg, may be treated with oral agents. Upon meta-analysis, antihypertensive therapy was found to reduce the incidence of severe hypertension by 50%. There was no difference in the rates of abruption, intrauterine growth retardation, preeclampsia, or prematurity.[6-8]

Acute severe hypertension is defined as a systolic BP >160 and a diastolic BP >100 mmHg. Therapy involves intravenous medications, and the goal is a BP of 140/90 to 155/105 mmHg. The antihypertensive agents typically prescribed are labetalol, hydralazine, and nifedipine. If the goal is not reached, nitroprusside may be used, but as a last resort, because of the risk of fetal cyanide poisoning. Patients presenting with hypertension should be closely monitored and undergo weekly laboratory tests, including urinalysis, complete blood count, creatinine level, and liver function.[9]

Chronic hypertension is defined as a BP ≥140/90 mmHg, recorded before pregnancy and before 20 weeks of gestation.[2] The incidence of this disorder is higher in women who are older, obese, or black.[10] Chronic hypertension increases morbidity and is associated with superimposed preeclampsia, placenta abruption, prematurity, growth restriction, and congenital heart disease.[11-13] Severe chronic hypertension can

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From: *Center for Women's Heart & Vascular Health, Texas Heart Institute, Houston, Texas 77030*

Address for reprints: *Stephanie A. Coulter, MD, Center for Women's Heart & Vascular Health, Texas Heart Institute, 6624 Fannin St., Suite 2780, Houston, TX 77030*

E-mail: *scoulter@texasheart.org*

result in stroke, heart failure, acute renal failure, hypertensive encephalopathy, and cerebral hemorrhage. Patients at risk should be evaluated before pregnancy,[2] and all teratogenic medications, such as angiotensin-converting enzyme inhibitors, should be replaced before conception.[14] Antihypertensive agents considered to be safe in pregnancy include methyldopa, diuretics, labetalol, calcium channel blockers, and hydralazine.[9]

Establishing the diagnosis of preeclampsia superimposed on chronic hypertension can be difficult.[2] This condition should be suspected in women who have a sudden increase in BP and proteinuria, or who develop transaminitis or thrombocytopenia.

Given the risks of these hypertensive conditions, frequent prenatal visits with careful monitoring of BP and proteinuria are essential. Home monitoring of maternal BP is also advisable.[15] Delivery should be considered in pregnant patients who develop severe hypertension and preeclampsia.

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