



Management and Treatment of Hypertension in Pregnancy and Women of Childbearing Age

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Women of childbearing age and pregnant women with hypertension represent an interesting and challenging population. In general, most young women have low blood pressure and typically do not require blood pressure medication until the later years. However, the increasing prevalence of obesity and metabolic syndrome is leading to an increased number of young women with hypertension.

This article will deal with several topics regarding the management of hypertension in women of childbearing age. Besides understanding the normal physiologic changes that occur with pregnancy and the diagnosis and treatment of essential hypertension in this group it is also important to recognize and treat, in a timely fashion, the hypertensive disorders that are associated with pregnancy.

Treatment of Essential Hypertension in Women of Childbearing Age

Hypertension in young women should be treated to goal according to the Joint National Committee 7 guidelines, which does not vary by gender or age. That means that normal blood pressure is < 120/80 mmHG, Pre-hypertension is a systolic range from 120-139/ diastolic range from 80-89; with hypertension considered to be >140/90 mmHG. Stage I hypertension ranges 140-159/90-99 and Stage II hypertension is > 160/100



mmHg. (There are complexities to the diagnosis and management of hypertension that can be further discussed with your cardiologist).

In general medications should be chosen carefully before being prescribed to women of childbearing age who are planning to become pregnant because many drugs have teratogenic potential (can cause fetal abnormalities). The Food and Drug Administration has developed guidelines and recommendations for use of these medications for women of childbearing age and during pregnancy. Class D medications have significant risk for fetal effects and should be avoided. Angiotensin-converting enzyme inhibitors (ACEI) and angiotensin-receptor blockers (ARBs) can block the development of the kidneys and therefore should be avoided. There are many medications that fall under an ambiguous category with no clinical evidence but also no controlled studies demonstrating safety. Those medicines that are felt to be safe are listed in table 1 on the next page.

Women of childbearing age with Stage I hypertension should be treated with lifestyle modification and exercise therapy. This should be stressed and encouraged for all stages of blood pressure. It is also important to know that birth control remains a common cause of hypertension in women and should be considered as a cause of hypertension.

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Table 1 Hypertension for Use during Pregnancy

Drug	Route	Dose	Activity Time	Action	Side Effects
First-line agent Methyldopa (B)	PO	0.25-1.5 g twice per day	3-5 d	False neurotransmitter	Orthostasis, sleepiness
Second-line agent Labetalol (C)	PO/IV	200-1200 mg/d 2 or 3 times per day in divided doses 20-40 mg IV every 30 min as needed	2-4 h/5 min	Nonselective β -blockade	Tremulousness, headache
Nifedipine (C)	PO	30-120 mg/d	30 min	Calcium channel blocker	Edema, orthostasis, dizziness
Hydralazine (C)	PO/IV	50-300 mg/d 2 or 3 times per day 10 mg IV every 2 h as needed	1-2 h/20-30 min	Direct vasodilator	Lupus-like syndrome with chronic use
HCTZ (C)	PO	12.5-25 mg daily	3-5 d	Diuretic	
Selective β -blockers (C)	PO	Variable	1-2 wk	Selective β -blocker	Generally safe, bradycardia, may decrease uteroplacental perfusion, neonatal hypoglycemia at higher doses
Metoprolol (C)	PO/IV	25-150 mg daily	3-5 d	Selective β -blocker	Bradycardia
Emergency Medications					
IV labetalol as noted above					
IV hydralazine as noted above					
Nifedipine (C) as noted above					
Diazoxide (C)	IV	30-50 mg IV every 5-15 min	2-4 min	Direct vasodilator	Hypotension, hypoglycemia
Nitroprusside (C or D)	IV	0.25-5 μ g/kg/min	1-2 min	Direct vasodilator	Hypotension, cyanide toxicity if used > 4 h

IV = intravenously; PO = by mouth; HCTZ = hydrochlorothiazide.

Types of Hypertensive Conditions During Pregnancy

Hypertension during pregnancy is defined as systolic pressure of 140 mmHg or higher, a diastolic pressure of 90 mmHg or higher, or both. Hypertension during pregnancy can be classified into three main categories- chronic hypertension, gestational hypertension, and preeclampsia, with or without preexisting hypertension. In general hypertensive disorders can complicate 12-22% of pregnancies and are a major cause of maternal morbidity and mortality.

Chronic hypertension is defined as blood pressure of 140/90 mmHg or higher that was present before pregnancy, before the 20th week gestation, or persisting beyond the 42nd postpartum day. Frequently, women with chronic hypertension must change their medical regimens when they anticipate pregnancy to maximize the safety of the growing fetus. Women of childbearing age who take chronic antihypertensive medications should

be counseled about the safety of these medications in the event of pregnancy well in advance of a potential pregnancy. In fact any sexually active woman not on birth control who also has hypertension should be treated with medication that is considered acceptable for the safety of the fetus.

Options for drug therapy are shown below:

First Line:

1. Alpha methyldopa, given orally.
2. Labetolol, given orally

Second Line:

1. Hydralazine, given orally
2. Nifedipine, given orally
3. Beta Blockers, given orally (acebutelol and pindolol are safest)

Contraindicated:

1. Angiotensin-converting

2. Angiotensin Receptor Blockers
3. Aldosterone Antagonists

Avoid:

1. Thiazide diuretics

Severe Hypertension Urgency or Emergency First Line

Labetolol (IV)
Hydralazine (IV)
Beta Blockers (IV)
Nifedipine (PO)

Gestational hypertension is defined as hypertension that (1) develops in the latter part of pregnancy, (2) is not associated with proteinuria or other features of preeclampsia, and (3) resolves by 12 weeks postpartum. This condition is also known as pregnancy-induced hypertension. Women with this condition may be at risk for the development of

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hypertension or cardiovascular disease, or both in the future. They should undergo an annual physical examination and screening for traditional risk factors for cardiovascular disease after their pregnancy.

Preeclampsia, also known as toxemia, occurs in 3-8% of pregnancies in the United States. The classic clinical triad involves accelerating hypertension, proteinuria (higher than 300 mg/24 hours), and edema. Symptoms usually begin in the third trimester. Although definitive treatment includes delivery of the baby, most women with preeclampsia will require treatment with antihypertensive medications before delivery and for some time postpartum. Hypertensive urgency caused by preeclampsia can be treated with intravenous labetalol or hydralazine. The cause of preeclampsia is still unclear. Eclampsia is the development of grand mal seizures in a woman with preeclampsia. Preeclampsia and eclampsia have been linked to the future development of cardiovascular disease. As with pregnancy-induced hypertension, women with preeclampsia and eclampsia should undergo an annual physical examination and screening for traditional risk factors for cardiovascular disease after their pregnancy.

Approach to Hypertension During Pregnancy

Blood pressure in pregnant women should be screened regularly. The American College of Obstetricians and Gynecologists definitions of hypertension are broken into 2 subgroups: mild (140 to 159/90 to 109 mmHg) and severe (>160/110 mmHg). In the obstetric literature there is little evidence to support aggressive medical therapy for blood pressures < 160/110 mmHg. The decision to treat hypertension must be individualized to a patient's condition. Generally, women with chronic hypertension tolerate higher blood pressures without complication. However anyone with blood pressures > 160/110 mmHg should be treated as the risk of arterial hemorrhagic events is high which is associated with a 50% mortality rates.

In the setting of severe hypertension with end-organ damage or neurologic compromise, rapid and aggressive intravenous antihypertensive treatment is necessary. The safety of the mother must come first, and early delivery of the child must be considered, especially

in the setting of eclampsia. Immediate goals of therapy are a 25% reduction of mean arterial pressure within 2 hours of presentation and a goal of 160/110 over the next several hours. Abrupt reductions of >25% mean arterial pressure might lead to maternal end-organ hypoperfusion or fetal compromise due to fetal ischemia. The physician treating the patient must consider hypertension associated syndromes such as preeclampsia, gestational hypertension and acute fatty liver.

Treatment of Hypertension During Breastfeeding

After delivery the mother's hemodynamics return to normal within 3 to 5 weeks. Blood pressure for those women who suffer from hypertension during pregnancy should be monitored after delivery. Therapy should be continued/initiated if blood pressure remains elevated 3 to 5 days postpartum. For those mothers who plan to breastfeed the list below is considered safe. If there are plans to have another child then the physician needs to continue to avoid medications that are considered unsafe for pregnancy.

List of Antihypertensives compatible with Breast Feeding:

Enalapril/Captopril (not to be used if there are plans for another pregnancy)

Diltiazem

Hydralazine

Hydrochlorothiazide

Labetalol

Methyldopa

Minoxidil

Nadolol

Oxprenolol

Proporanolol

Spiroinolactone

Timolol

Verapamil.

Conclusions

Hypertension in Pregnancy is a challenging issue. Discussion and appropriate treatment in all women of child-bearing age is mandatory.

Regular screening for hypertension during pregnancy is required because it is a harbinger of dangerous syndromes. Therapy should be initiated for severe hypertension (> 160/110 mmHg). Postpartum patients should be monitored for hypertension and treated according to accepted guidelines with attention to reproductive goals and breastfeeding. Women who experienced pregnancy induced hypertension or preeclampsia should be monitored regularly after delivery because of increased risk for future cardiovascular disease.



About The Author

Arie Szatkowski, M.D., FACC is Board Certified in Internal Medicine and Cardiology. He received his M.D. from Cornell University Medical College in New York. Dr. Szatkowski completed his Cardiology Fellowship, as well as, internship and residency in Internal Medicine at New York Presbyterian Hospital, Columbia University in New York. In 2000, he was named "Physician of the Year". Also, while in his residency, Dr. Szatkowski earned the prestigious Arnold P. Gold Award for Excellence in Humanism and Teaching and was appointed Chief Fellow in Cardiology. Dr. Szatkowski joined the Stern Cardiovascular Center in July, 2003. Dr. Szatkowski's interests include: Clinical Cardiology, Congestive Heart Failure, Valvular Disorders, Adult Congenital Disease, Coronary Artery Disease and Preventive Cardiology. He also offers Nuclear Cardiology and Clinical Echocardiography including Transesophageal Echocardiography. Dr. Szatkowski is on the staff of Baptist Memorial, Saint Francis and Methodist hospitals. 901-271-1000. Dr Szatkowski, is presently located at the Southaven, MS office.