Hypertension in Pregnancy

(Report of the ACOG Task Force on Hypertension in Pregnancy)

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Classification of Hypertensive Disorders of Pregnancy

Four categories:

1. *Preeclampsia-eclampsia* (BP elevation after 20 weeks of gestation with proteinuria or any of the severe features of preeclampsia listed below)
2. *Chronic hypertension* (of any cause that predates pregnancy)
3. *Chronic hypertension with superimposed preeclampsia* (chronic hypertension in association with preeclampsia)
4. *Gestational hypertension* (BP elevation after 20 weeks of gestation in the absence of proteinuria or any of the severe features of preeclampsia listed below)

Severe Features of Preeclampsia (Any of these findings):

1. Hypertension: systolic $\geq$160 or diastolic $\geq$110 on two occasions at least 4 hours apart while the patient is on bed rest (unless antihypertensive therapy is initiated before this time).
2. Thrombocytopenia (platelet count <100,000).
3. Impaired liver function (elevated blood levels of liver transaminases to twice the normal concentration), severe persistent RUQ or epigastric pain unresponsive to medication and not accounted for by alternative diagnoses, or both.
4. New development of renal insufficiency (elevated serum creatinine greater than 1.1 mg/dL, or doubling of serum creatinine in the absence of other renal disease).
5. Pulmonary edema.
6. New-onset cerebral or visual disturbances.

Proteinuria

Defined as the excretion of $\geq$300mg of protein in a 24-hour urine collection. Alternatively, a timed excretion that is extrapolated to this 24-hour urine value, or a *protein/creatinine ratio* of at least 0.3 (each measured as mg/dL). The *dipstick method* is discouraged for diagnostic use unless other approaches are not readily available. 1+ is considered as the cutoff for the diagnosis of proteinuria.

The diagnosis of severe preeclampsia is no longer dependent on the presence of proteinuria. Do not delay management of preeclampsia in the absence of proteinuria.

Massive proteinuria (> 5 g) has been eliminated from consideration of preeclampsia as severe.

Fetal growth restriction has been removed as a finding indicative of severe preeclampsia.

Prevention of Preeclampsia

Antioxidants: vitamins C and E are not effective.
Calcium: may be useful in populations with low calcium intake (not in the USA).
Low-dose aspirin (60 to 80 mg): beginning in the late first trimester may have slight effect to reduce preeclampsia and adverse perinatal outcomes.
Bed rest or *salt restriction*: no evidence of benefit.

Management of Preeclampsia and HELLP Syndrome

Recent changes in management:

1. Timing of delivery: In women with preeclampsia without severe features is 37 0/7 weeks of gestation.
2. Postpartum management: Nonsteriodal antiinflammatory agents may contribute to increased BP and should be replaced by other analgesics in women with hypertension that persists for more than 1 day postpartum.

TASK FORCE RECOMMENDATIONS

- Close monitoring of women with gestational hypertension or preeclampsia without severe features, with serial assessment of maternal symptoms and fetal movement (daily by the woman), serial measurements of BP (twice weekly), and assessment of platelet counts and liver enzymes (weekly) is suggested.

- For women with gestational hypertension, monitoring BP at least once weekly with proteinuria assessment in the office and with an additional weekly measurement of BP at home or in the office is suggested.

- For women with mild gestational hypertension or preeclampsia with a persistent BP of less than 160 systolic or 110 diastolic, it is suggested that antihypertensive medications not be administered.

- For women with gestational hypertension or preeclampsia without severe features, it is suggested that strict bed rest not be prescribed.

- For women with preeclampsia without severe features, use of US to assess fetal growth and antenatal testing to assess fetal status is suggested.

- If evidence of fetal growth restriction is found in women with preeclampsia, fetoplacental assessment that includes umbilical artery Doppler velocimetry as an adjunct antenatal test is recommended.

- For women with mild gestational hypertension or preeclampsia without severe features and no indication for delivery at less than 37 0/7 weeks of gestation, expectant management with maternal and fetal monitoring is suggested.

- For women with mild gestational hypertension or preeclampsia without severe features at or beyond 37 0/7 weeks of gestation, delivery rather than continued observation is suggested.

- For women with preeclampsia with systolic BP of less than 160 and a diastolic BP less than 110 and no maternal symptoms, it is suggested that magnesium sulfate not be administered universally for the prevention of eclampsia.

- For women with severe preeclampsia at or beyond 34 0/7 weeks of gestation, and in those with unstable maternal or fetal conditions irrespective of gestational age, delivery soon after maternal stabilization is recommended.

- For women with severe preeclampsia at less than 34 0/7 weeks of gestation with stable maternal and fetal conditions, it is recommended that continued pregnancy be undertaken only at facilities with adequate maternal and neonatal intensive care resources.

- For women with severe preeclampsia receiving expectant management at 34 0/7 weeks or less of gestation, the administration of corticosteroids for fetal lung maturity benefit is recommended.

- For women with preeclampsia with severe hypertension during pregnancy (sustained systolic BP of at least 160 or diastolic of at least 110), the use of antihypertensive therapy is recommended.

- For women with preeclampsia, it is suggested that a delivery decision should not be based on the amount of proteinuria or change in the amount of proteinuria.

- For women with severe preeclampsia and before fetal viability, delivery after maternal stabilization is recommended. Expectant management is not recommended.

- It is suggested that corticosteroids be administered and delivery deferred for 48 hours if maternal and fetal conditions remain stable for women with severe preeclampsia and a viable fetus at 33 6/7 weeks or less of gestation with any of the following:

    - preterm premature rupture of membranes
    - labor
    - low platelet count (<100,000)
    - persistently abnormal hepatic enzyme concentrations (twice or more the upper normal values)
    - fetal growth restriction (less than the fifth percentile)
    - severe oligohydramnios (AFI <5 cm)
    - reversed end-diastolic flow on umbilical artery Doppler studies
    - new-onset renal dysfunction or increasing renal dysfunction

- It is recommended that corticosteroids be given if the fetus is viable and at 33 6/7 weeks or less of gestation, but that delivery not be delayed after initial maternal stabilization regardless of gestational age for women with severe preeclampsia that is complicated further with any of the following:

    - uncontrollable severe hypertension

- eclampsia
- pulmonary edema
- abruption placentae
- disseminated intravascular coagulation
- evidence of nonreassuring fetal status
- intrapartum fetal demise

- For women with preeclampsia, it is suggested that the mode of delivery need not be cesarean delivery. The mode of delivery should be determined by fetal gestational age, fetal presentation, cervical status, and maternal and fetal conditions.

- For women with eclampsia, the administration of parental magnesium sulfate is recommended.

- For women with severe preeclampsia, the administration of intrapartum-postpartum magnesium sulfate to prevent eclampsia is recommended.

- For women with preeclampsia undergoing cesarean delivery, the continued intraoperative administration of parenteral magnesium sulfate to prevent eclampsia is recommended.

- For women with HELLP syndrome and before the gestational age of fetal viability, it is recommended that delivery be undertaken shortly after initial maternal stabilization.

- For women with HELLP syndrome at 34 0/7 weeks or more of gestation, it is recommended that delivery be undertaken soon after initial maternal stabilization.

- For women with HELLP syndrome from the gestational age of fetal viability to 33 6/7 weeks of gestation, it is suggested that delivery be delayed for 24-48 hours if maternal and fetal conditions remain stable to complete a course of corticosteroids for fetal benefit.

- For women with preeclampsia who require analgesia for labor or anesthesia for cesarean delivery and with a clinical situation that permits sufficient time for establishment of anesthesia, the administration of neuraxial anesthesia (either spinal or epidural anesthesia) is recommended.

- For women with severe preeclampsia, it is suggested that invasive hemodynamic monitoring <u>not</u> be used routinely.

- For women in whom gestational hypertension, preeclampsia, or superimposed preeclampsia is diagnosed it is suggested that BP be monitored in the hospital or that equivalent outpatient surveillance be performed for at least 72 hours postpartum and again 7-10 days after delivery or earlier in women with symptoms.

- For all women in the postpartum period (not just women with preeclampsia), it is suggested that discharge instructions include information about the signs and symptoms of preeclampsia as well as the importance of prompt reporting of this information to their health care providers.

- For women in the postpartum period who present with new-onset hypertension associated with headaches or blurred vision or preeclampsia with severe hypertension, the parenteral administration of magnesium sulfate is suggested.

- For women with persistent postpartum hypertension, BP of 150 systolic or 100 diastolic or higher, on at least two occasions that are at least 4-6 hours apart, antihypertensive therapy is suggested. Persistent BP of 160 systolic or 110 diastolic or higher should be treated within 1 hour.

Management of Women with Prior Preeclampsia

Preconception counseling and assessment is suggested. Potentially modifiable lifestyle activities, such as weight loss and increased physical activity, should be encouraged. Medical problems such as hypertension and diabetes should be brought into the best possible control. Folic acid supplementation should be recommended. Consider low-dose aspirin in the upcoming pregnancy.

Chronic Hypertension and Superimposed Preeclampsia

- For women with features suggestive of secondary hypertension, referral to a physician with expertise in treating hypertension to direct the workup is suggested.

- For pregnant women with chronic hypertension and poorly controlled BP, the use of home BP monitoring is suggested.

- For women with suspected white coat hypertension, the use of ambulatory BP monitoring to confirm the diagnosis before the initiation of antihypertensive therapy is suggested.

- It is suggested that weight loss and extremely low sodium diets (<100 mEq/d) not be used for managing chronic hypertension in pregnancy.

- For women with chronic hypertension who are accustomed to exercising, and in whom BP is well controlled, it is recommended that moderate exercise be continued during pregnancy.

- For pregnant women with persistent chronic hypertension with systolic BP of 160 or higher diastolic BP of 105 or higher, antihypertensive therapy is recommended.

- For pregnant women with chronic hypertension and BP less than 160 systolic or 105 diastolic and no evidence of end-organ damage, it is suggested that they not be treated with pharmacologic antihypertensive therapy.

- For pregnant women with chronic hypertension treated with antihypertensive medication, it is suggested that BP levels be maintained between 120 systolic and 80 diastolic and 160 systolic and 105 diastolic.

- For the initial treatment of pregnant women with chronic hypertension who require pharmacologic therapy, labetalol, nifedipine, or methyldopa are recommended above all other antihypertensive drugs.

- For women with uncomplicated chronic hypertension in pregnancy, the use of angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, renin inhibitors and mineralocorticoid receptor antagonists is not recommended.

- For women of reproductive age with chronic hypertension, the use of angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, renin inhibitors, and mineralocorticoid receptor antagonists is not recommended unless there s a compelling reason, such as the presence of proteinuric renal disease.

- For women with chronic hypertension who are at a greatly increased risk of adverse pregnancy outcomes (history of early-onset preeclampsia and preterm delivery at less than 34 0/7 weeks of gestation or preeclampsia in more than one prior pregnancy) initiating the administration of daily low-dose aspirin (60-80 mg) beginning in the late first trimester is suggested.

- For women with chronic hypertension, the use of ultrasonography to screen for fetal growth restriction is suggested.

- If evidence of fetal growth restriction is found in women with chronic hypertension, fetoplacental assessment to include umbilical artery Doppler velocimetry as an adjunct antenatal test is recommended.

- For women with chronic hypertension complicated by issues such as the need for medication, other underlying medical conditions that affect fetal outcome, or any evidence of fetal growth restriction, and superimposed preeclampsia, antenatal fetal testing is suggested.

- For women with chronic hypertension and no additional maternal or fetal complications, delivery before 38 0/7 weeks of gestation is not recommended.

- For women with superimposed preeclampsia who receive expectant management at less than 34 0/7 weeks of gestation, the administration of corticosteroids for fetal lung maturity benefit is recommended.

- For women with chronic hypertension and superimposed preeclampsia with severe features, the administration of intrapartum-postpartum parental magnesium sulfate to prevent eclampsia is recommended.

- For women with superimposed preeclampsia without severe features and stable maternal and fetal conditions, expectant management until 37 0/7 weeks of gestation is suggested.

- Delivery soon after maternal stabilization is recommended irrespective of gestational age or full corticosteroid benefit for women with superimposed preeclampsia that is complicated further by any of the following:

- uncontrollable severe hypertension
- eclampsia
- pulmonary edema
- abruption placentae
- disseminated intravascular coagulation
- nonreassuring fetal status

- For women with superimposed preeclampsia with severe features at less than 34 0/7 weeks of gestation with stable maternal and fetal conditions, it is recommended that continued pregnancy should be undertaken only at facilities with adequate maternal and neonatal intensive care resources.

- For women with superimposed preeclampsia with severe features, expectant management beyond 34 0/7 weeks of gestation is not recommended.

Later-life Cardiovascular Disease in Women with Prior Preeclampsia

Women who have had a preeclamptic pregnancy are at an increased risk of later-life CV disease. This increase ranges from a doubling of risk in all cases to an eightfold to ninefold increase in women with preeclampsia who gave birth before 34 0/7 weeks of gestation. Recommendation is for lifestyle modification (maintenance of a healthy weight, increased physical activity, and not smoking) and early evaluation for the most high-risk women.

- For women with a medical history of preeclampsia who gave birth preterm (less than 37 0/7 weeks of gestation) or who have a medical history of recurrent preeclampsia, yearly assessment of BP, lipids, fasting blood glucose, and BMI is suggested.

Patient Education

- It is suggested that health care providers convey information about preeclampsia in the context of prenatal care and postpartum care using proven health communication practices.

The information in *Hypertension in Pregnancy* should not be viewed as a body of rigid rules. The guidelines are general and intended to be adapted to many different situations, taking into account the needs and resources particular to the locality the institution, or the type of practice. Variations and innovations that improve the quality of patient care are to be encouraged rather than restricted. The purpose of these guidelines will be well served if they provide a firm basis on which local norms may be built.