PREECLAMPSIA-WHEN SHOULD WE GO FOR TERMINATION/DELIVERY?

Kuvacic I and Plavec A.

Department of Obstetrics and Gynecology, Medical School, University of Zagreb, Croatia

Definition. Preeclampsia refers to the new onset of hypertension and proteinuria after 20 weeks of gestation in a previously normotensive women (table 1). It complicates 5 to 8 percent of pregnancies in the United States and is the second most common cause of maternal mortality in the United States (after thromboembolic disease).[1-4]

Preeclampsia superimposed upon chronic hypertension - Superimposed preeclampsia is diagnosed when a woman with chronic hypertension develops new onset proteinuria after 20 weeks of gestation. Women with chronic hypertension and preexisting proteinuria (before 20 weeks) are considered preeclamptic if there is an exacerbation of blood pressure to the severe range (systolic ≥180 mmHg or diastolic ≥110 mmHg) in the last half of pregnancy, especially if accompanied by symptoms (table 2) or a sudden increase in proteinuria. [5,6]

When should we go for delivery? The definitive treatment of preeclampsia is delivery to prevent potential maternal complications. Delivery is recommended for women with mild preeclampsia at or near term and for most women with severe preeclampsia[7] or severe gestational hypertension[8-10] regardless of gestational age. However, preterm delivery is not always in the best interests of the fetus; therefore, exceptions to this recommendation may be made for women remote from term (less than 32 to 34 weeks of gestation) who improve after hospitalization and do not have significant end-organ dysfunction or fetal deterioration.

Close maternal monitoring upon diagnosis is important to establish disease severity and rate of progression. Hospitalization is useful for making these assessments and facilitates rapid intervention in the event of fulminant progression to eclampsia, hypertensive crisis, abruptio placentae, or HELLP syndrome. However, these complications are rare in women with mild hypertension, minimal proteinuria (eg, less than 1 g in 24 hours), and no other abnormalities, therefore, carefully selected patients with these findings may be managed on an ambulatory basis after initial in-patient evaluation.[11,12] Such women should be able to comply with frequent maternal and fetal evaluations (every one to three days) and have ready access to medical care. Restricted activity is typically recommended; there is no evidence that complete

bedrest improves pregnancy outcome.[13] Hospitalization is indicated if there are signs or symptoms of disease progression.

All women with severe preeclampsia (table 3) should be delivered or hospitalized for the duration of pregnancy. Prolonged antepartum management may be considered in selected women under 32 to 34 weeks of gestation who have:

- Severe proteinuria (greater than 5 g in 24 hours), since this finding alone is not associated with serious maternal or fetal sequelae, while preterm delivery may be hazardous for the neonate.[13]
- Mild intrauterine fetal growth restriction (fifth to tenth percentile), as long as antepartum fetal testing remains reassuring, oligohydramnios is not severe, umbilical artery diastolic flow is not reversed on Doppler velocimetry, and there is progressive fetal growth.
- Severe hypertension with blood pressure reduction after hospitalization.[14,15]
- Asymptomatic laboratory abnormalities that quickly resolve after hospitalization.[14,15]

The rationale for delaying delivery in these pregnancies is to reduce perinatal morbidity and mortality by delivery of a more mature fetus and, to a lesser degree, to achieve a more favorable cervix for vaginal birth. The risk of prolonging pregnancy is continued poor perfusion of major organs with the potential for severe end organ damage to the brain, liver, kidneys, placenta/fetus, and hematologic and vascular systems. Decisions regarding continuation of pregnancy in these women depend upon daily maternal and fetal assessment (table 4) with continual review of the ongoing risks of conservative management versus the benefit of further fetal maturation. They should be cared for in consultation with a maternal-fetal medicine specialist.

Delivery should be initiated, after a course of antenatal corticosteroid therapy if possible, when there is poorly controlled severe hypertension, eclampsia, thrombocytopenia (less than 100,000 platelets/microL), elevated liver function tests with epigastric or right upper quadrant pain, pulmonary edema, rise in serum creatinine concentration by 1 mg/dL over baseline, placental abruption, or persistent severe headache or visual changes. Fetal indications for delivery include nonreassuring fetal testing, severe oligohydramnios, or severe fetal growth restriction (less than the 5th percentile).

In general, timing of delivery is based upon the maternal and fetal condition and gestational age. General indications for delivery are listed in table 5.

- Women who develop severe preeclampsia at or beyond 32 to 34 weeks of gestation should be delivered.
- Women with mild disease remote from term can be managed expectantly to enable further

fetal growth and maturation. Women with mild disease and a favorable cervix or who are noncompliant may benefit from induction as early as 37 weeks; otherwise, delivery by 40 weeks of gestation should be considered.

- In selected cases, women with stable, severe disease under 32 to 34 weeks may be managed expectantly with daily maternal and fetal monitoring. Ideally, delivery can be delayed until either a course of glucocorticoids to accelerate fetal lung maturation can be completed[16] or there is evidence of fetal pulmonary maturity or 34 weeks of gestation are completed.[17-23] This is a controversial area, with some authors recommending immediate delivery for all women with severe preeclampsia because of the maternal and fetal risks of expectant management. Delivery should be undertaken if there are signs of worsening disease (eg, severe hypertension not controlled with antihypertensive therapy, cerebral/visual symptoms, platelet count <100,000 cells/microL, deterioration in liver or renal function, abdominal pain, severe fetal growth restriction, signs of abruption, nonreassuring fetal testing). Progression to eclampsia is also an indication for delivery.

Route of delivery — Delivery is usually by the vaginal route, with cesarean delivery reserved for the usual obstetrical indications. Severe preeclampsia does not mandate immediate cesarean birth.[24] Cervical ripening agents may be used if the cervix is not favorable prior to induction.[25] The safety of induction was illustrated by a retrospective study that compared the outcome of 278 singleton, live born infants between 750 and 1500 g in mothers with severe preeclampsia who had labor induced to the outcome of 133 infants born after scheduled cesarean delivery.[26] Apgar scores <3 at five minutes were infrequent, but were more likely in the induction group (6 versus 2 percent with cesarean delivery, p = 0.04). The incidence of other complications such as respiratory distress syndrome, grade 3 or 4 intraventricular hemorrhage, seizures, sepsis, and neonatal death were similar in the two groups. The rate of vaginal delivery after labor induction decreases to about 33 percent at less than 28 to 34 weeks because of the high frequency of nonreassuring fetal heart rate tracings and failure of the cervix to dilate.[25,27] For this reason, some authors recommend scheduled cesarean delivery for women with severe preeclampsia who are under 30 weeks of gestation and have a low Bishop score.[28] In term nulliparous women, labor duration does not appear to be affected by either preeclampsia or magnesium sulfate administration.[29] Close, continuous maternal-fetal monitoring is indicated intrapartum to identify worsening hypertension, deteriorating maternal hepatic, renal, cardiopulmonary, or hematologic function, and uteroplacental insufficiency or abruption (often manifested by nonreassuring fetal heart rate tracings, vaginal bleeding).

Anticonvulsant therapy is generally initiated during labor or while administering corticosteroids or prostaglandins prior to planned delivery and continued until 24 to 48 hours postpartum, when the risk of seizures is low. Magnesium sulfate is the drug of choice for seizure prevention.[1,30-32] It is more effective than the anticonvulsant phenytoin[31,33] or the antihypertensive drug nimodipine.[34]

The Parkland Hospital group, for example, randomly assigned 2138 preeclamptic women admitted to Labor and Delivery to receive either magnesium sulfate or phenytoin.[32] Eclamptic seizures developed in 10 of the 1089 women assigned to phenytoin compared to none of the 1049 women assigned to magnesium sulfate ($p = 0.004$). Maternal and neonatal outcomes were similar in both groups. In addition, a Cochrane review found magnesium sulfate was safer and better than lytic cocktail for the prevention of repeat seizures in eclamptic women.[35]

The results of our 5-year study of preeclampsia will be presented.

Criteria for Preeclampsia

Systolic blood pressure ≥140 mmHg
or
Diastolic blood pressure ≥ 90 mmHg†
and
Proteinuria of 0.3 g or greater in a 24-hour urine specimen††

†Diastolic blood pressure is determined based upon disappearance the fifth Korotkoff sound with patient sitting

††A random urine protein determination of 30 mg/dL or 1+ on dipstick is suggestive, but not diagnostic, of the presence of this criterion

table 1.

Signs Suggestive of Preeclampsia Superimposed on Chronic Hypertension†

New onset proteinuria

Sudden increase in proteinuria

Hypertension and proteinuria beginning prior to 20 weeks of gestation

A sudden increase in blood pressure

Thrombocytopenia

Elevated aminotransferases

†Working Group on High Blood Pressure in Pregnancy. National Institutes of Health Washington, DC 2000

table 2.

Criteria for Severe Preeclampsia

New onset proteinuric hypertension and at least one of the following:

Symptoms of central nervous system dysfunction:
Blurred vision, scotomata, altered mental status, severe headache

Symptoms of liver capsule distention:
Right upper quadrant or epigastric pain
Nausea, vomiting

Hepatocellular injury:
Serum transaminase concentration at least twice normal

Severe blood pressure elevation:
Systolic blood pressure ≥160 mm Hg or diastolic ≥110 mm Hg
on two occasions at least six hours apart

Thrombocytopenia:
Less than 100,000 platelets per cubic millimeter

Proteinuria:
Over 5 grams in 24 hours or 3+ or more on two random samples four hours apart

Oliguria < 500 mL in 24 hours

Intrauterine fetal growth restriction

Pulmonary edema or cyanosis

Cerebrovascular accident

table 3.

Fetal Assessment in Preeclampsia†

Mild preeclampsia

Daily fetal movement counting

Ultrasound examination for estimation of fetal weight and amniotic fluid determination at diagnosis. Repeat in three weeks if the initial examination is normal, twice weekly if there is evidence of fetal growth restriction or oligohydramnios

Nonstress test and/or biophysical profile once or twice weekly. Testing should be repeated immediately if there is an abrupt change in maternal condition.

Severe preeclampsia

Daily nonstress testing and/or biophysical profile

†Adapted from Working group report on high blood pressure in pregnancy. National Institutes of Health, Washington, DC 2000. p 18.

table 4.

Indications for Delivery in Preeclampsia†

Maternal indications

Gestational age greater than or equal to 38 weeks of gestation
Platelet count less than 100,000 cells per cubic millimeter
Deteriorating liver function
Progressive deterioration in renal function (eg, creatinine >2 mg/dL, oliguria)
Abruptio placentae
Persistent severe headaches or visual changes
Persistent severe epigastric pain, nausea, or vomiting

Fetal indications

Severe fetal growth restriction
Nonreassuring results from fetal testing
Oligohydramnios

†Working Group Report on High Blood Pressure in Pregnancy. National Institutes of Health, Washington, DC 2000. p 19.

table 5.

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