



PRE-ECLAMPSIA

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ABSTRACT

Preeclampsia is a pregnancy complication characterized by high blood pressure and signs of damage to another organ system, most often the liver and kidneys. Preeclampsia usually begins after 20 weeks of pregnancy in women whose blood pressure had been normal. Even a slight rise in blood pressure may be a sign of preeclampsia. Left untreated, preeclampsia can lead to serious, even fatal, complications for both mother and baby. The exact cause of preeclampsia involves several factors. Experts believe it begins in the placenta, the organ that nourishes the fetus throughout pregnancy. Medical management has been taken to prevent further complication.

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INTRODUCTION

Preeclampsia is a multi-system, progressive disorder characterized by the new onset of hypertension and proteinuria or hypertension and end-organ dysfunction with or without proteinuria in the last half of pregnancy. Progression from mild to severe on the disease spectrum may be gradual or rapid. Preeclampsia is a pregnancy complication characterized by high blood pressure and signs of damage to another organ system, most often the liver and kidneys. Preeclampsia usually begins after 20 weeks of pregnancy in women whose blood pressure had been normal.

Definition

Preeclampsia is a complication of pregnancy marked by hypertension and proteinuria. Preeclampsia, also known as toxemia or pregnancy-induced hypertension (PIH), usually appears in the latter part of the second trimester or in the third trimester, but it can occur earlier or postpartum

High Risk Factors

Preeclampsia develops only as a complication of pregnancy. Risk factors include:

- **History of preeclampsia.** A personal or family history of preeclampsia significantly raises your risk of preeclampsia.

- **Chronic hypertension.** If you already have chronic hypertension, you have a higher risk of developing preeclampsia.
- **First pregnancy.** The risk of developing preeclampsia is highest during your first pregnancy.
- **New paternity.** Each pregnancy with a new partner increases the risk of preeclampsia more than does a second or third pregnancy with the same partner.
- **Age.** The risk of preeclampsia is higher for very young pregnant women as well as pregnant women older than 40.
- **Obesity.** The risk of preeclampsia is higher if you're obese.
- **Multiple pregnancy.** Preeclampsia is more common in women who are carrying twins, triplets or other multiples.
- **Interval between pregnancies.** Having babies less than two years or more than 10 years apart leads to a higher risk of preeclampsia.
- **History of certain conditions.** Having certain conditions before you become pregnant—such as chronic high blood pressure, migraines, type 1 or type 2 diabetes, kidney disease, a tendency to develop blood clots, or lupus—increases your risk of preeclampsia.
- **In vitro fertilization.** Your risk of preeclampsia is increased if your baby was conceived with in vitro fertilization.

Causes

Causes of this abnormal development may include:

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Pre-Eclampsia

- Insufficient blood flow to the uterus
- Damage to the blood vessels
- A problem with the immune system
- Certain genes

Symptoms of Preeclampsia

Mild preeclampsia

- high blood pressure
- water retention and
- protein in the urine.

Severe preeclampsia

- headaches,
- blurred vision,
- inability to tolerate bright light,
- fatigue,
- nausea/vomiting,
- urinating small amounts,
- pain in the upper right abdomen,
- shortness of breath,
- Sudden weight gain and swelling (edema), particularly in face and hands and
- tendency to bruise easily.

Complications of Pre Eclampsia

Complications of preeclampsia may include

1. **Fetal growth restriction:** Preeclampsia affects the arteries carrying blood to the placenta. If the placenta doesn't get enough blood, your baby may receive inadequate blood and oxygen and fewer nutrients. This can lead to slow growth known as fetal growth restriction, low birth weight or preterm birth.
2. **Preterm birth:** If you have preeclampsia with severe features, you may need to be delivered early, to save the life of you and your baby. Prematurity can lead to breathing and other problems for your baby. Your health care provider will help you understand when is the ideal time for your delivery.
3. **Placental abruption:** Preeclampsia increases your risk of placental abruption, a condition in which the placenta separates from the inner wall of your uterus before delivery. Severe abruption can cause heavy bleeding, which can be life-threatening for both you and your baby.
4. **HELLP syndrome:** HELLP-which stands for hemolysis (the destruction of red blood cells), elevated liver enzymes and low platelet count-syndrome is a more severe form of preeclampsia, and can rapidly become life-threatening for both you and your baby.
5. Symptoms of HELLP syndrome include nausea and vomiting, headache, and upper right abdominal pain. HELLP syndrome is particularly dangerous because it represents damage to several organ systems. On occasion, it may develop suddenly, even before high blood pressure is detected or it may develop without any symptoms at all.
6. **Eclampsia:** When preeclampsia isn't controlled, eclampsia-which is essentially preeclampsia plus seizures-can develop. It is very difficult to predict which patients will have preeclampsia that is severe enough to result in eclampsia. Often, there are no symptoms or

warning signs to predict eclampsia. Because eclampsia can have serious consequences for both mom and baby, delivery becomes necessary, regardless of how far along the pregnancy is.

7. **Other organ damage:** Preeclampsia may result in kidney, liver, lung, heart, or eyes, and may cause a stroke or other brain injury. The amount of injury to other organs depends on the severity of preeclampsia.
8. **Cardiovascular disease:** Having preeclampsia may increase your risk of future heart and blood vessel (cardiovascular) disease. The risk is even greater if you've had preeclampsia more than once or you've had a preterm delivery. To minimize this risk, after delivery try to maintain your ideal weight, eat a variety of fruits and vegetables, exercise regularly, and don't smoke.

Pathophysiology

The exact cause of preeclampsia involves several factors. Experts believe it begins in the placenta-the organ that nourishes the fetus throughout pregnancy. Early in pregnancy, new blood vessels develop and evolve to efficiently send blood to the placenta.

In women with preeclampsia, these blood vessels don't seem to develop or function properly. They're narrower than normal blood vessels and react differently to hormonal signaling, which limits the amount of blood that can flow through them.

Diagnosis

All women who present with new-onset hypertension should have the following tests:

- CBC
- Serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) levels
- Serum creatinine
- Uric acid
- 24-hour urine collection for protein and creatinine (criterion standard) or urine dipstick analysis
- Additional studies to perform if HELLP syndrome is suspected are as follows:
 - Peripheral blood smear
 - Serum lactate dehydrogenase (LDH) level
 - Indirect bilirubin

Although a coagulation profile (prothrombin time [PT], activated partial thromboplastin time [aPTT], and fibrinogen) should also be evaluated, its clinical value is unclear when the platelet count is $100,000/\text{mm}^3$ or more with no evidence of bleeding.^[4]

- Head CT scanning is used to detect intracranial hemorrhage in selected patients with any of the following:
 - Sudden severe headaches
 - Focal neurologic deficits
 - Seizures with a prolonged postictal state
 - Atypical presentation for eclampsia

Other Procedures

- **Ultrasonography:** Transabdominal, to assess the status of the fetus and evaluate for growth restriction; umbilical artery Doppler ultrasonography, to assess blood flow

- **Cardiotocography:** The standard fetal nonstress test and the mainstay of fetal monitoring

Management

Delivery is the only cure for preeclampsia. Patients with preeclampsia without severe features are often induced after 37 weeks' gestation. Before this, the patient is usually hospitalized and monitored carefully for the development of worsening preeclampsia or complications of preeclampsia, and the immature fetus is treated with expectant management with corticosteroids to accelerate lung maturity in preparation for early delivery.

In patients with preeclampsia with severe features, induction of delivery should be considered after 34 weeks' gestation. In these cases, the severity of disease must be weighed against the risks of infant prematurity. In the emergency setting, control of BP and seizures should be priorities.

Criteria for delivery

Women with preeclampsia with severe features who are managed expectantly must be delivered under the following circumstances:

- Nonreassuring fetal testing including (nonreassuring nonstress test, biophysical profile score, and/or persistent absent or reversed diastolic flow on umbilical artery Doppler velocimetry)
- Ruptured membranes
- Uncontrollable BP (unresponsive to medical therapy)
- Oligohydramnios, with amniotic fluid index (AFI) of less than 5 cm
- Severe intrauterine growth restriction in which the estimated fetal weight is less than 5%
- Oliguria (< 500 mL/24 hr)
- Serum creatinine level of at least 1.5 mg/dL
- Pulmonary edema
- Shortness of breath or chest pain with pulse oximetry of < 94% on room air
- Headache that is persistent and severe
- Right upper quadrant tenderness
- Development of HELLP syndrome
- Eclampsia
- Platelet count less than 100,000 cells/microL
- Placental abruption
- Unexplained coagulopathy

Seizure Treatment and Prophylaxis

- The basic principles of airway, breathing, and circulation (ABC) should always be followed
- Magnesium sulfate is the first-line treatment for primary and recurrent eclamptic seizures
- Treat active seizures with IV magnesium sulfate^[5]: A loading dose of 4 g is given by infusion pump over 5-10 minutes, followed by an infusion of 1 g/hr maintained for 24 hours after the last seizure
- Treat recurrent seizures with an additional bolus of 2 g or an increase in the infusion rate to 1.5 or 2 g per hour
- Prophylactic treatment with magnesium sulfate is indicated for all patients with preeclampsia with severe features
- Lorazepam and phenytoin may be used as second-line agents for refractory seizures

Acute Treatment of Severe Hypertension in Pregnancy

Antihypertensive treatment is recommended for severe hypertension (SBP >160 mm Hg; DBP >110 mm Hg). The goal of hypertension treatment is to maintain BP around 140/90 mm Hg.

Medications used for BP control include the following:

- Hydralazine
- Labetalol
- Nifedipine
- Sodium nitroprusside (in severe hypertensive emergency refractory to other medications)

Fluid Management

- Diuretics should be avoided
- Aggressive volume resuscitation may lead to pulmonary edema
- Patients should be fluid restricted when possible, at least until the period of postpartum diuresis
- Central venous pressure (CVP) or pulmonary artery pressure monitoring may be indicated in critical cases
- A CVP of 5 mm Hg in women with no heart disease indicates sufficient intravascular volume, and maintenance fluids alone are sufficient
- Total fluids should generally be limited to 80 mL/hr or 1 mL/kg/hr

Post Partum Management

- Many patients will have a brief (up to 6 hours) period of oliguria following delivery
- Magnesium sulfate seizure prophylaxis is continued for 24 hours postpartum
- Liver function tests and platelet counts must document decreasing values prior to hospital discharge
- Elevated BP may be controlled with nifedipine or labetalol postpartum
- If a patient is discharged with BP medication, reassessment and a BP check should be performed, at the latest, 1 week after discharge
- Unless a woman has undiagnosed chronic hypertension, in most cases of preeclampsia, the BP returns to baseline by 12 weeks' postpartum
- Patients should be carefully monitored for recurrent preeclampsia, which may develop up to 4 weeks postpartum, and for eclampsia that has occurred up to 6 weeks after delivery

CONCLUSION

Even a slight rise in blood pressure may be a sign of preeclampsia. Monitoring blood pressure is an important part of prenatal care because the first sign of preeclampsia is commonly a rise in blood pressure. Blood pressure that exceeds 140/90 millimeters of mercury (mm Hg) or greater. Management has to be taken to prevent from complication to both mother and baby.

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