

Preeclampsia / Eclampsia- Diagnosis and Management



Preeclampsia and Eclampsia Detection and Management

- During the admission process:
 - Review the patient's record, noting medical history and obstetric history
 - Note predisposing factors-
- Assess the following:
 - Baseline BP
 - Proteinuria
 - Weight gain
 - [Sudden excessive wt. gain is sometimes the first sign of impending preeclampsia. (2# or more per week in the 3rd trimester)]
- History or current complaint of headache or blurred vision and/or severe edema of the hands, legs, feet, and face.

Hypertensive Disorders of Pregnancy

- Leading cause of maternal morbidity
- Accounts for 16.1% of maternal deaths in developing countries
- Occur in 5%-12% of all pregnancies
- Encompasses a spectrum of diagnoses
 - *Chronic hypertension* - dx prior to 20 weeks
 - *Preeclampsia* - mild or severe
 - *Preeclampsia superimposed on chronic hypertension*
 - *Gestational Hypertension* - does not meet criteria for diagnosis of preeclampsia (formerly PIH)
 - *Transient Hypertension*

Pathophysiology of Preeclampsia

Proteinuria and Pre-eclampsia

When the body is not plagued by abnormality, the blood vessels are lined with closely knit cells. These cells and the protein prevent leakage of water into the surrounding tissues.

Proteins (made up of 60% albumin) within the cells carry a magnetic charge that is capable of attracting water thus keeping it within the blood vessels. When the blood reaches the kidneys, the pores in the glomerulus are also negatively charged, and prevent the protein from escaping into the surrounding tissues.

Pre-eclampsia and eclampsia are characterized by hypertension, proteinuria, and edema.

With hypertension, the pores in the glomerulus lose some of their negatively charged capability, the magnetic character of the protein is reduced, and the protein easily escapes into the surrounding tissues (proteinuria). With less protein there is nothing to keep the water (80% of blood is made up of water) within the vessels.

In addition, hypertension also causes the blood vessels walls to be damaged; thus allowing the unrestrained water to escape into the surrounding tissues leading to worsening edema and loss of blood volume, an ominous sign of progressive disease.

Preeclampsia Risk Factors

- Primigravida
- Multifetal gestation
- Preeclampsia with a previous pregnancy
- Chronic hypertension
- Diabetes
- Obesity
- Over age 35 or under age 19
- African American

Assessment and Physical Exam on Admission

- Check BP - *Check BP sitting in L arm*
- Check for edema
- Check deep tendon reflexes
- Evaluate clean-catch urine
- Question patient about:
 - headaches
 - blurred vision
 - loss of consciousness
 - nausea and vomiting
 - worsening edema
 - epigastric pain
 - general sick feeling

Mild

- Mild:
- BP has reached 140/90 to 160/110 mmHg on two different occasions 4 hours apart. (an increase of the diastolic reading is a more reliable indication of preeclampsia)
- Proteinuria is 2+ or between 300 mg and 5 g in a 24 hours urine specimen.
- Weight gain / Edema are no longer essential

Mild Preeclampsia Management

- Confirm Diagnosis-on suspecting diagnosis of preeclampsia simultaneously treat and further evaluate the mother and fetus
- Document fetal well being
- If > 37 weeks – induction
- If < 37 weeks
 - *Inpatient Management*
 - *Outpatient Management* possible if SBP < 150 or DBP < 100 and normal laboratory findings-recommend daily kick counts and biweekly NST

Severe

- BP rises to 160/110 mmHg or higher on two different occasions 4 hours apart.
- Proteinuria is 5 g or higher in a 24 hours urine specimen.
- Urine output decreases to less than 500ml in 24 hours. The kidneys can go into failure with little output. This is a serious situation that can lead to permanent injury.

Note: clinical signs of preeclampsia can appear suddenly. Never underestimate the importance of even mild BP elevations complicating a pregnancy.

Severe preeclampsia symptoms

- Severe headaches
- Visual problems
- Epigastric pain
- Nausea or vomiting
- Thrombocytopenia
- IUGR or Oligohydramnios
- Elevated serum creatinine
- Elevated liver functions of unclear etiology
- Irritability, restlessness, or apprehension
- Pulmonary edema with respiratory distress
- Eclampsia

Early recognition of worsening preeclampsia when a patient is hospitalized is critical.

Routine Laboratory Analysis

- Complete Blood Count
- Platelet count-below 150, 000 thrombocytopenia, below 100, 000 severe coagulopathy, below 50, 000 correct prior to surgery
- Liver Function Tests-ALT, AST
- Renal Function Tests-Creatinine, BUN, Uric Acid-increased uric acid is an early sign of liver involvement
- Urinalysis and Microscopy
- 24 hour urine for Protein and Creatinine Clearance-protein increases as creatinine clearance decreases
- Blood Type and antibody screen

Severe Preeclampsia

- Fetal outcome is poor, often as a result of growth restriction and/or asphyxia at birth.
- Incidence of serious complications in the mother is high
- Signs to watch for:
 - Abruptio placentae
 - HELLP syndrome
 - Eclampsia
 - DIC
 - Acute Renal Failure

Maternal Morbidity

- Abruptio Placenta (1-4%)
- DIC/HELLP Syndrome (10-20%)
- Pulmonary Edema/Aspiration (1-5%)
- Eclampsia ((1-5%)
- Hepatic Failure/Hemorrhage (<1%)
- Cerebral Hemorrhage (rare)

Perinatal Morbidity

- Preterm Birth (15-67%)
- Intrauterine Growth Restriction-IUGR (10-25%)
- Intrauterine Fetal Demise-IUFD (1-2%)
- Hypoxia-Neurologic Injury (<1%)
- Fetal intolerance to labor
- 2-fold increase in neonatal death

Nursing Management

- ***Primary Goals:***

- Prevent convulsions through the use of Magnesium Sulfate
- Ensure adequate kidney function
- Monitor fetal status- assure moderate variability prior to initiating Magnesium Sulfate
- Stabilize the woman so that delivery can be accomplished
- The ***definitive treatment*** for preeclampsia is delivery.

Nursing Management

- Intense maternal monitoring
- MgSO₄ administration
- Antihypertensive medications
- Depending on the condition of mother and fetus, delivery might be indicated
- Electronic fetal monitoring
- 1:1 nurse to patient ratio
- Assess vital signs based on status to determine worsening of the disease and response to therapy.
- Obtain BP with consistent methods
- Record hourly intake and output using a Foley catheter with a urometer.
- Reduce stimulation from noise and light.
- Maintain patient on strict bedrest
- Maintain IV access (D5W or LR at not more than 150 mL/hr)
- Lab work as ordered including: type and crossmatch and platelets
- Test urine for protein
- Assess deep tendon reflexes
- Ask patient to tell you if she develops a headache, blurred vision, dizziness, or epigastric pain, or if she feels uncomfortable or different.
- Observe the patient for restlessness or apprehension

Magnesium Sulfate Therapy

- Drug of choice to prevent seizures
- Loading dose: 4-6 grams
- Maintenance dose: 2-3 grams/hr
- Dependent on renal function-if renal function is impaired the kidneys will not excrete the magnesium
- Associated with cerebral arterial vasodilation which may relieve cerebral ischemia
- Decreases plasma endothelin-1 which protects the vascular endothelial cells
- Potentiates beta blockers
- Increases potency and duration of non depolarizing muscle relaxants-general anesthetic
- Increases bleeding times
- Decreases platelet activity-don't stick as well

Magnesium Sulfate Therapy

- High alert medication
- Never a primary line
- Always use an infusion pump
- Always document in grams per hour
- Calcium gluconate immediately available
- Assess for signs of toxicity
- Assess DTR's
- Assess urine output hourly
- Assess heart rate and rhythm
- Auscultate lungs – listen for signs of pulmonary congestion
- Assess respiratory rate and quality

Antihypertensives

- *Indicated when*

- Underlying chronic hypertension
- To achieve BP control to prevent cerebral vascular accident while effecting delivery
- Expectant management of severe preeclampsia by BP criteria alone
- Used to prevent cerebral hemorrhage, stroke (usually BP > 170)

Hydralazine

- Direct peripheral vasodilation
- Increases cardiac output and heart rate
- Dosages 5mg IV or 10mg IM
 - 5-10mg every 20-30 min
 - Maximum is 20 IV to 30 IM
- Can cause rebound tachycardia and hypotension

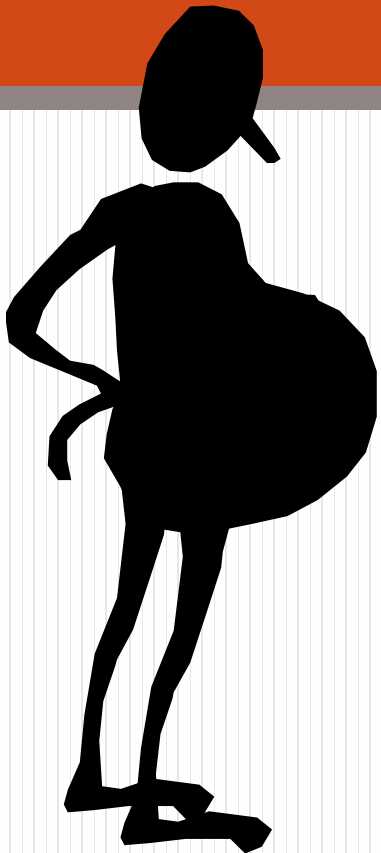
Labatelol

- Selective alpha and non-selective beta antagonist
- Dosage:
 - Initial 20mg IV
 - If effect sub optimal, then 40mg IV 10 min later
 - If effect sub optimal, then 80mg IV 10 min later for two additional doses
 - Maximum of 300mg
- Decreases vascular resistance
- Works better in stacked doses
- Can cause fetal bradycardia and neonatal hypoglycemia

Seizure Precautions

- HAVE EMERGENCY EQUIPMENT READY!
- Oxygen and suctioning equipment must be immediately available. Check that the equipment is in operating order.
- Keep an emergency cart nearby.
- Administer MgSO₄ as ordered. It is currently believed to be the safest and most effective anticonvulsant drug available.

The patient with severe preeclampsia or eclampsia needs intensive monitoring. She should never be left alone!



Eclampsia

- Eclampsia is the generalized seizure or seizures and/ or coma either during pregnancy or in the postpartum period in the presence of preeclampsia and with no other neurological or medical etiology. The exact cause of the seizures is unknown, although possible mechanisms include cerebral vasospasm and a form of hypertensive encephalopathy.
- Eclamptic seizures are self-limiting and usually last less than 4 min
- Incidence in the US is 1:3250 births
 - Antepartum: 50% of eclamptic seizures occur prior to delivery
 - Postpartum: early postpartum eclampsia occurs within 48 hours of delivery. Late postpartum eclampsia occurs between 48hrs and 4 weeks after delivery. Aggressive treatment has shifted the incidence of postpartum eclampsia from early to late- 79% late
- 2nd most common cause of maternal death
- 15% of all maternal deaths in the US

Eclampsia Treatment

- Stabilize the mother and control the seizures
 - Call for assistance
 - Protect the airway
 - Start medications
- Deliver the fetus
 - During the acute event the mother takes precedence
 - The fetus will do better when the mother is stabilized
 - Cesarean section does not need to be performed immediately
 - Induction of labor is reasonable after the seizure has been controlled in the term and near term fetus if in a vertex position and fetal distress is resolved