LEARNING OBJECTIVES

• Understand the risk factors for severe preeclampsia and eclampsia

• Describe the key treatments for management of severe preeclampsia

• Be familiar with the current recommendations for treatment and monitoring after eclampsia

• Understand treatments for severe hypertension

BACKGROUND

PREECLAMPSIA - DEFINITION

• New onset hypertension >20 weeks gestation in a women with previously normal blood pressure
  • Systolic BP ≥ 140 / diastolic BP ≥ 90 on two occasions at least 4 hours apart
  • Proteinuria
    • ≥ 300 mg per 24 hour urine collection
    • Protein/creatinine ratio greater than or equal to 0.3 mg/dL
    • Dipstick reading of 1+ (only if other quantitative methods are not available)

SEVERE PREECLAMPSIA - DEFINITION

• Systolic BP ≥ 160 / diastolic BP ≥ 110 - can be confirmed in a short interval to allow for timely antihypertensive therapy
• Thrombocytopenia (<100,000)
• Impaired liver function (AST/ALT >2x normal)
• Severe persistent RUQ/epigastric pain unresponsive to medication and not accounted for by another diagnosis
• Progressive renal insufficiency to >1.1 or a doubling of serum creatinine in the absence of other renal disease
• Pulmonary edema
• New onset cerebral edema or visual changes
ECLAMPSIA - DEFINITION

- New onset grand mal seizures in a woman with preeclampsia and absence of other neurological conditions

IMPORTANT CHANGES

- Many recent changes in the diagnostic criteria for severe preeclampsia
- Recognizing the syndromic nature of preeclampsia, the dependence of the diagnosis on proteinuria has been eliminated. “In the absence of proteinuria, preeclampsia is diagnosed as hypertension in association with thrombocytopenia, impaired liver function, new development of renal insufficiency, pulmonary edema or new-onset cerebral or visual disturbances.”

INCIDENCE

- Severe Preeclampsia
  - Approximately 1% of all pregnancies
- Eclampsia
  - 0 – 0.6% of women with mild preeclampsia
  - 2 – 3% of women with severe preeclampsia (without seizure prophylaxis)
  - 1.6 – 10 cases per 10,000 deliveries in developed countries

RISK FACTORS

- Nulliparity
- History of preeclampsia
- Age >40 or <18
- Family history of preeclampsia
- Chronic hypertension
- Chronic renal disease
- Autoimmune disorder (Antiphospholipid antibody)
- Diabetes
- Multifetal gestation
- Obesity
- Black race
- Fetal growth restriction, abruptio or fetal demise in previous pregnancy
- IVF
- Hydrops fetalis
- Partner-related factors

COMPLICATIONS

- Preterm delivery
- Growth restriction
- Placental abruption
- Maternal stroke
- Acute renal failure
- DIC
- Maternal death
- Stillbirth
- Increased risk of cardiovascular complications later in life

MANAGEMENT
IMPORTANT POINTS

• If preterm and delivery can be safely delayed for the administration of antenatal steroids, then expectant management for at least 48 hours can be considered
  - Inpatient management required
  - Seizure prophylaxis with magnesium sulfate until delivery decision is made
• Eclampsia is a contraindication to expectant management, regardless of gestational age

EXPECTANT MANAGEMENT

• Some patients with severe preeclampsia <34 weeks may be candidates for expectant management
  - Patients need to meet specific criteria in order to be expectantly managed
  - Hospitalized until delivery
• May discontinue magnesium sulfate after 24-48 hours and steroid course complete
  - BP monitored every 4 hours
• Maintain strict intake/output
• Frequently assess maternal symptoms

EXPECTANT MANAGEMENT

• Assess labs at least twice per week, usually every other day
  - CBC/AST/ALT/Creatinine
• Fetal assessment
  - Daily NST
  - AFI weekly
  - Doppler assessment as least weekly if growth restricted
• Consult neonatology/anesthesia

CONTRAINDICATIONS TO EXPECTANT MANAGEMENT

• Maternal hemodynamic instability
• Non-reassuring fetal testing
• Severe hypertension unresponsive to medical therapy
• Severe headaches/visual changes
• Pulmonary edema
• Renal failure
• Placental abruption
• HELLP
• PPROM
• Diagnosis prior to viability
• Gestational age >34 weeks
• Eclampsia

IMMEDIATE DELIVERY

• >34 weeks immediate delivery
  - administer antenatal steroids up to 36/6 weeks however do not delay delivery
• <33/6 weeks, administer antenatal steroids but do not delay delivery if any of the following are present
  - Uncontrolled severe hypertension
  - Eclampsia
  - Pulmonary edema
  - Placental abruption
  - DIC
  - Non-reassuring fetal status

MAY CONSIDER DELAYED DELIVERY

• If <33/6wk, administer antenatal corticosteroids and delay delivery for 48 hours if mother/fetus are stable and any of the following conditions are present:
  - Preterm labor
  - PPROM
  - Platelet count <100k
  - Persistently elevated liver enzymes
  - Fetal growth restriction <35%ile
  - Severe oligohydramnios (AFI <5)
  - Reversed end-diastolic flow of umbilical arteries
  - New onset renal dysfunction
**ECLAMPSIA**

**IMPORTANT POINTS**
- Seizure may last up to 4 minutes
- Fetal heart rate tracing will be non-reassuring likely with significant decelerations
- Continue to monitor and consider urgent delivery if no resolution approximately 10 minutes **AFTER** the seizure
- Treatment with magnesium sulfate prevents recurrent seizures and decreases maternal mortality
- Treat hypertension aggressively as 15-20% of deaths occur from eclampsia related strokes

**ECLAMPSIA OCCURRENCE**
- Antepartum – 38-55%
- Intrapartum – 36%
- Postpartum
  - <48 hours – 5-39%
  - >48 hours – 5-17%

**HYPERTENSIVE TREATMENT**

**INTRAPARTUM/POSTPARTUM MANAGEMENT**
- Magnesium sulfate seizure prophylaxis after diagnosis and for at least 24 hours following delivery
- Continue intraoperative administration if cesarean section is performed
- Continue to monitor blood pressure and treat severe range hypertension
- Monitor laboratory values
- Close monitoring of urine output
- Monitor for magnesium toxicity

**ECLAMPSIA CHECKLIST**

- **Communicate diagnosis to team members**
  - Position patient
  - Left lateral decubitus
  - Raise bed rail/keep patient in safe position
- **Call for additional assistance**
  - Physician/Nursing/Anesthesia/Pediatrics
  - Maternal Care
    - Provide O2 by facemask
    - Obtain IV access
    - Treat severe hypertension (>160/110) with IV medication
  - Fetal Care
    - Continuous tococ/FHT – EXPECT DECELS
  - Magnesium Sulfate
    - 6 grams IV over 15-20 minutes OR 10 grams IM (5 grams each buttock)
ANTI-HYPERTENSIVE THERAPY

- Urgent treatment for severe range blood pressures
  - Systolic BP ≥ 160 mm Hg
  - Diastolic BP ≥ 110 mm Hg
- Severe hypertension increases the risk maternal nervous system injury
  - Cerebral hemorrhage
  - Cerebral infarct
  - Maternal stroke

FIRST LINE THERAPY

- IV Labetalol or Hydralazine are preferred first line agents
- Oral Nifedipine can also be considered however less data exists on efficacy
- Magnesium sulfate is NOT recommended as an antihypertensive however is the drug of choice for seizure prophylaxis

ANTI-HYPERTENSIVE FLOWS

LABETALOL
- 20mg IV over 2 minutes
  - Check BP 15 minutes
- 40mg IV over 2 minutes
  - Check BP 20 minutes
- 80mg IV over 2 minutes
  - Check BP 20 minutes
  - Switch to Hydralazine if remains >160/110

HYDRAZINE
- 5-10 mg IV over 2 minutes
  - Check BP 15 minutes
- 10mg IV over 2 minutes
  - Check BP 20 minutes
- 10mg IV over 2 minutes
  - Check BP 20 minutes
  - Change to Labetalol if still >160/110

REFERENCES

- Magnesium Sulfate Use in Obstetrics. ACOG Committee Opinion #573, Sept 2013.
- Emergent Therapy for Acute-Onset, Severe Hypertension with Preeclampsia or Eclampsia. ACOG Committee Opinion #514, Dec 2011.
- Repka JT. What is new in preeclampsia? Best articles from the past year.