

UPDATES ON PREECLAMPSIA

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OBJECTIVES

- Define hypertensive disorders in pregnancy
- Recognize diagnostic criteria for preeclampsia
- Review updates on prevention recommendations
- Overview of treatment, timing of delivery, and labor management

DEFINITIONS

■ Chronic Hypertension

- Elevated blood pressure $\geq 140/90$ prior to 20 WGA

■ Gestational Hypertension

- Elevated blood pressure $\geq 140/90$ after 20 WGA
 - On 2 occasions ≥ 4 hours apart
- Increased risk of preeclampsia
- 50% of women diagnosed with gestational hypertension between 24 and 35 WGA eventually develop preeclampsia

PRE ECLAMPSIA

Preeclampsia without severe features

- Elevated blood pressure $\geq 140/90$
 - 2 occasions ≥ 4 hours apart, after 20 weeks gestation, previously normal BP
- Proteinuria
 - 24 hour urine protein ≥ 300 mg/24 hours
 - Protein:Creatinine ratio ≥ 0.3
 - $\geq +1$ protein on urine dipstick
- If no proteinuria ≥ 1 of the following:
 - New cerebral or vision changes
 - Pulmonary edema
 - Hepatic dysfunction: Elevated liver enzymes >2 x upper end of normal or persistent right upper quadrant pain
 - Renal insufficiency: serum creatinine ≥ 1.1 or doubled from baseline
 - Thrombocytopenia: platelets $<100,000$

PREECLAMPSIA WITH SEVERE FEATURES

- Severe features:
 - BP \geq 160/110
 - New cerebral or vision changes
 - Pulmonary edema
 - Hepatic dysfunction: Elevated liver enzymes >2 x upper end of normal or persistent right upper quadrant pain
 - Renal insufficiency: serum creatinine ≥ 1.1 or doubled from baseline
 - Thrombocytopenia: platelets $<100,000$

BACKGROUND

- Preeclampsia complicates 2% to 8% of pregnancies worldwide
- Increases maternal and infant morbidity and mortality
 - Associated with 10-15% (50,000-60,000) of maternal deaths worldwide
- Accounts for 15-20% of preterm births in the United States
- Incidence of preeclampsia has increased 25% in past two decades

PATHOGENESIS

- Likely combination of maternal, fetal, and placental factors
- Primarily caused by abnormal placental development and implantation
 - Defect in trophoblasts + defect in spiral arteries → decreased blood flow → decreased perfusion → release of immune factors → endothelial dysfunction → maternal hypertension, preeclampsia
- Immune factors
 - antiangiogenic, low placental growth factor
- Genetic predisposition
 - maternal, paternal, thrombophilias
- Environmental factors
 - Obesity, low calcium
- Systemic endothelial dysfunction, oxidative stress

PREVENTION

- Aspirin – USPSTF Grade B recommendation
 - Low-dose aspirin (81 mg/d) after 12 weeks of gestation in women who are at high risk for preeclampsia
- Vitamin E or C – not recommended
- Vitamin D – unclear evidence
- Calcium supplementation may provide benefit if low calcium levels
- No significant evidence supporting omega 3 fatty acid supplementation or salt restriction
- Bed rest not recommended
- Modifying risk factors such as obesity

ASPIRIN THERAPY

- Start at 12-16 WGA, discontinue 5-10 days prior to delivery
 - Greater effectiveness shown <16 WGA
- Dose: 81mg aspirin daily (60-150mg)
- Per USPSTF: Aspirin (60 to 150 mg/d) reduced the risk for preeclampsia by 24%, preterm birth by 14% and IUGR by 20%
- Other studies show more modest risk reduction
 - 10% decreased risk of preeclampsia
 - 2-4% decreased risk of IUGR and preterm birth
- No adverse effects shown
- Mechanism of action uncertain
 - Proposed: Decreased platelet thromboxane and prostaglandin production → decreased endothelial damage

WHO SHOULD RECEIVE ASPIRIN?

HIGH RISK (>1)

- History of preeclampsia
- Multifetal gestation
- Chronic hypertension
- Type 1 or 2 diabetes
- Renal disease
- Autoimmune disease (systemic lupus erythematosus, antiphospholipid syndrome)

MODERATE RISK (>2)

- Nulliparity
- Obesity (BMI >30 kg/m²)
- Family history of preeclampsia (mother or sister)
- Sociodemographic characteristics: African American race, low socioeconomic status
- Maternal age ≥35 years old
- Personal history factors: low birthweight or small for gestational age, previous adverse pregnancy outcome, >10-year pregnancy interval

TREATMENT GUIDELINES

Preeclampsia without severe features

- Delivery if ≥ 37 0/7 weeks gestational age
- If < 37 WGA:
 - Twice weekly blood pressure monitoring and non stress test
 - Weekly labs (CBC, LFTs, creatinine)
 - Daily kick counts
 - Ultrasound to evaluate fetal growth
 - Delivery at 37 WGA

TREATMENT GUIDELINES

Preeclampsia with severe features

- Delivery if ≥ 34 0/7 WGA
- If < 34 WGA:
 - Close monitoring in facility with NICU, then delivery at 34 WGA
 - If stable may delay delivery 48 hours for steroids
- Treatment with magnesium sulfate and antihypertensives for blood pressure $\geq 160/110$

TREATMENT GUIDELINES

■ Chronic Hypertension in pregnancy

- Treatment not recommended unless BP persistently $\geq 150/100$
- Preferred antihypertensive medications: Methyldopa, labetalol, nifedapine
- Ultrasound to evaluate fetal growth
- Delivery at 38-39 WGA

■ Gestational Hypertension

- Twice weekly blood pressure monitoring
- Weekly nonstress test and urine protein testing
- Ultrasound to evaluate fetal growth
- Delivery at 37 WGA

LABOR MANAGEMENT

- Urine output maintained >30 mL/hour
- Intravenous fluids <100 mL/hr (Total <125 mL/hr including meds)
- Spinal or epidural recommended
- Treatment of blood pressure $\geq 160/110$
- Medications:
 - Magnesium
 - 4-6g loading dose followed by 2g/hour
 - Continued 24 hrs postpartum
 - Monitor for magnesium toxicity
 - Labetalol
 - Initial dose 20mg IV, if BP remains $\geq 160/110$ may give 20-80mg IV q10-30min, max 300mg/24hours
 - Hydralazine
 - 5mg IV, may repeat with 5-10mg in 10 min if BP $\geq 160/110$

CONCLUSION

- Preeclampsia is a multisystem disease with elevated blood pressure and proteinuria and/or signs of end organ damage
- 60-150mg aspirin daily recommended for prevention with ≥ 1 high risk factor or ≥ 2 moderate risk factors beginning at 12-16 WGA until 5-10 days prior to delivery
- Treatment of preeclampsia begins with delivery
- Only use antihypertensives or magnesium to treat elevated blood pressures $\geq 160/110$

RESOURCES

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QUESTIONS?