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Hypertensive Diseases in Pregnancy

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Hypertensive Diseases in Pregnancy: HTDP

- Incidence: 12-22% of Pregnancies in the U.S.
- Leading contributor to PTB
- Typically a disease of the late 3rd trimester
- Etiology: No Known Etiology
- Disease of theories
  - Autoimmune factors
  - Genetic factors
  - Placental "mismatching"
- Biomarkers are being investigated

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Morbidity and Mortality

- Complications arising from hypertensive disorders in pregnancy are among the leading cause of preventable severe maternal morbidity/mortality (SMM)
- Responsible for 17.6% of Maternal deaths in the United States
- Leading causes of maternal death in the U.S. :
  - Thromboembolic events
  - Hemorrhage
  - Pregnancy associated hypertension

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Predisposing Factors:

- Primigravida
- Hx of Underlying vascular disease
- Age extremes
- Previous history
- Genetic/familial predisposition
- Predisposition to hypertension
- Multifetal gestation and/or invitro fertilization
- Obesity

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Classification:

- ***Gestational Hypertension***: (replaces the term Pregnancy Induced Hypertension-PIH)
  - Elevated blood pressure without proteinuria develops in a woman after 20 weeks of gestation and BP levels return to normal postpartum.
  - Hypertension: 140mmHg/90mmHg in a woman with previously normal BP
  - 25% with gest. HTN will develop preeclampsia
  - Usually normalizes by 12 weeks postpartum

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Classification cont'd:

- **Preeclampsia**: progressive syndrome defined as HTN in association with:
  - **Blood Pressure:**
    - 140mmHg systolic or higher or 90mmHg diastolic or higher that occurs after 20 weeks gestation in women with a previously normal blood pressure AND
  - **Proteinuria**:
    - Urinary excretion of 0.3grams or higher in a 24 hour collection OR,
    - Protein/creatinine ratio > to 0.3 mg/dl
    - Dipstick of 1+ or greater if no other quantitative methods are available

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Classification cont'd:

- In the absence of proteinuria, new onset HTN with the new onset of:
- ("***severe features***")
  - BP 160/110 or higher on 2 occasions,
    - Persistent severe HTN for 15 min or more is a Hypertensive emergency!
  - Progressive renal insufficiency
    - Serum creatinine conc. > 1.1mg/dl
    - Or doubling of serum creatinine in the absence of other renal failure
  - Cerebral or visual disturbances(new onset)
  - Pulmonary edema or cyanosis
  - RUQ or epigastric pain
  - Impaired liver function- (twice normal concentration)
  - Thrombocytopenia- (platelet count < 100,000

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Classification cont'd:

- ***Eclampsia***: new-onset grand mal seizures in a woman with preeclampsia- constitutes a life threatening emergency
  - 1/1,000 deliveries
  - Can appear up to 28 days postpartum
- Basic principles:
  - Support cardiorespiratory functions
  - Prevent recurrent seizures
  - Correct maternal hypoxemia and academia
  - Initiate planning process for a timely birth

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Classification cont'd:

- ***Superimposed preeclampsia/ecalmpsia*** on chronic HTN:
  - new-onset in a woman with HTN prior to 20 weeks gest.
  - sudden increase in proteinuria if already present in early gestation
  - sudden in ↑HTN, ↑ LFT's, ↓ Platelets
- Development of HELLP syndrome
- Development of headache, scotomata, or epigastric pain

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Classification cont'd

- ***Chronic Hypertension***:
  - Hypertension(> 140Hg systolic or 90 mmHg diastolic prior to conception, or before 20 weeks gestation
  - Persists > 12 weeks postpartum
  - Use of antihypertensives before pregnancy if HTN considered severe or presence of renal dz
  - Treated separately from preeclampsia
  - Elevated BP is the major problem

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Classification cont'd

- ***HELLP SYNDROME***- laboratory markers for a severe form of preeclampsia
- Responsible for the highest morbidity/mortality
  - **H-** Hemolysis
  - **EL**- Elevated Liver enzymes
  - **LP**- Low platelets

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Complications of HTDP:

- Cerebral hemorrhage (stroke)
- Cerebral edema
- Seizures
- Cardio-pulmonary-hepatic dysfunction
- Placental abruption
- Endothelial damage
- DIC
- IUGR
- Death (maternal or fetal)

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Pathophysiology

- Multi-organ system involvement-progressive
- Characterized by vasospasm
- Leaky capillaries
- Platelet aggregation/consumption
- Tissue ischemia
- Alterations in placental perfusion

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Pathophysiology

- Hematologic system
  - Volume constriction
  - Endothelial damage
  - Platelet aggregation/consumption
  - Hemolysis

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Pathophysiology

- Uteroplacental system
  - Hypoxia
  - IUGR
  - Abruption
  - Fetal Death

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Pathophysiology

- Hepatic system
  - Elevated liver enzymes
  - Subcapsular hematoma
  - Hepatic rupture (rare)

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Pathophysiology

- Renal system
  - Decreased renal blood flow
  - Oliguria (< 500ml/24hrs.)
  - Decreased GFR
  - Decreased Cr Cl
  - Increased BUN
  - Increased serum creatinine
  - Increased urine protein

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Pathophysiology

- Central Nervous system:
  - Increased cerebrovascular resistance
  - Increased ICP
  - CNS irritability
  - Hyperreflexia/clonus- not considered diagnostic
  - HA
  - Visual disturbances
  - Seizures

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Prevention:

- Low dose aspirin therapy – 60-80 mg/day
  - Begin late first trimester
- In women with ↑ risk for preeclampsia and no evidence of adverse effect or contraindication to ASA Rx.
- Reduces risk of preeclampsia by 24% in clinical trials:
  - In women with a medical history of early onset preeclampsia and PTD at < 34 0/7 weeks or preeclampsia in more than one prior pregnancy

(*US preventative Services Task Force, 2014*)

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Treatment:

- **Goals of treatment**:

1. **Decrease vasospasm**: goal is not to normalize BP, lowering of SBP or DBP is important to prevent stroke and other sequelae
   - Antihypertensive therapy: ***recommended for diastolic BP 105-110mm Hg or*** higher-(severe HTN in women who are pregnant or in the postpartum period with preeclampsia or eclampsia- ***recommended within 30-60 min*** of verification of blood pressure)
   - ***Hydralazine***-powerful vasodilator-first line treatment
     - Can cause reflex tachycardia
   - ***Labetalol*** – First line treatment
     - Beta blocker; use if tachycardiapresent
     - Avoid inwomen with asthma, heartdz. or CHF
   - ***Nifedipine*** – Calcium channel blocker-reserved for extreme emergencies -powerful response is unpredictable
     - Not FDA approved
- * *Sodium nitroprusside is reserved for extreme emergencies because of concerns about cyanide or thiocyanate toxicity*

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Treatment:

2. **Prevent seizures:**
   - MgSO4 – treatment of choice in the U.S.
     - CNS depressant; not an antihypertensive!
   - Monitor for toxicity
   - Loss of patellar reflex
   - Currently recommended for patients with severe preeclampsia.
   - If no severe features, no Mag Sulfate
   - 4-6 g loading dose followed by 2g/hr as continuous infusion
   - Standard of care: 24 hours postpartum
   - 1/3 of patients will seize in the first 24 hours

"High alert medication"

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Eclampsia Treatment

- Tonic/clonic in nature- (it is natural to want to do something):
- Secure the airway-
- Apply O2- 8-10 liters mask
- FHR will decelerate r/t maternal hypoxia
- Turn her to side- she will vomit! Do not let her aspirate! (have suction ready)
  - Aspiration is leading cause of morbidity after seizure
- 9/10 seizures will stop on their own if you do nothing…
- "6-2-2"-treatment regimen- MgSO4 RX of choice
  - 6gram loading dose
  - 2 gram IV-slow over 10-20 min
  - 2 gram IV-slow over 10-20 min
  - (if not slowing or stopping- give anti seizure)

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Treatment:

3. ***Deliver a healthy baby!***
   - Patients can labor and deliver vaginally
   - Timing if delivery: 37 0/7 weeks gest- preeclampsia without severe features
   - Only cure is delivery!
   - Continue assessments postpartum
   - Patient is at increased risk with next pregnancy
   - Postpartum Follow is critical:
     - 3-7 days if Bp meds used
     - 7-14 days if dx of Preeclampsia but no meds used

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HELLP Syndrome

- First described in 1982- Dr. Weinstein
- Acronym used for the laboratory markers in patients with severe preeclampsia
  - H- Hemolysis
    - Peripheral smear
    - Total bili > 1.2mg.dl
  - EL – elevated liver enzymes
    - LD >600 U/L
    - SGOT/AST- >70 U/L(twice baseline values)
  - LP - Low platelets
    - < 150,000
    - Severity of disease is based on platelet levels

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HELLP Syndrome

- Incidence: 4,000 – 16,000 women annually
  - 20% of women with preeclampsia
- 1,480 to 5,920 (37%) newborn deaths
  - 70% rate of PTB- 15% before 28weeks
- Approx. 156 maternal deaths (1-24%)
  - Often misdiagnosed results in delayed medical treatment
- Classification:
  - Class I-platelet count < 50,000
  - Class II- platelet count > 50,000 & < 100,000
  - Class III- platelet count nadir > 100,000 & < 150,000

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HELLP Syndrome

- Complications:
  - –Coagulopathy (DIC)
  - –Hepatic Rupture
  - –ARDS
  - –Acute renal failure
  - –Pulmonary edema
  - –Death

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Morbidity and Mortality in the US

- National Partnership for Maternal Safety:
  - Up to 60% of maternal deaths are preventable
  - Key errors:
    - Failure to adequately control BP
    - Failure to recognize HELLP
    - Failure to adequately diagnose and treat Pulmonary edema
- Any pregnant woman with preeclampsia c/o SOB, persistent cough, significant changes in pulse ox or Respiratory rate need prompt evaluation! (call a rapid!)
  - *ACOG,(2014) vol. 123(5)*

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Nursing Considerations

- *Knowledge* – become familiar with the standards of care to advocate for appropriate patient treatment
- *Assessments*: focus is on disease progression
- *Counseling* – warning signs and symptoms
  - Encourage patients to know their history
  - Preeclampsia is assoc. with CV dz, later in life
  - Educate patients on warning signs/symptoms
- *Accurate blood pressure assessments* –Mercury sphygmomanometer is the gold standard
  - Seated; not left side-lying
  - Level with the heart with an appropriate sized cuff
  - Focus on trends, not a single reading
- *Teach self-monitoring of fetal well-being*
  - Kick-counts

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Nursing Considerations:

- Reflexes
  - Used to assess for early signs of MgSO4 toxicity
  - Clonus assessment
- Assessments:
  - Visual changes
  - Severe headaches
  - Unusual bleeding, bruising
  - Laboratory values- know pregnancy normals
  - Fetal assessments
- Documentation
- Follow-up – stress importance of PP visit!! "***The Fourth Trimester***"
- Interconception care
  - Schedule follow up for BP check- 7-10 days after delivery
- Birth spacing

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Ticket Out the Door…3-2-1

- List 3 risk factors for Hypertensive diseases in pregnancy
- List 2 assessment criteria for a patient with severe preeclampsia
- Name 1 antihypertensive used to treat hypertensive crisis

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Questions??

Thank you!!