Severe Pre-Eclampsia
REMOTE from Term

Dr. Ragini Verma,
Professor,
Surat.
Pregnancy Hypertension:

- WHO Systematic reviews (Khan and colleagues – 2006)
  - 16% of Maternal deaths in developed countries (hhage – 13%)
- India –
  - Actual number of deaths due to Pregnancy Hypertension is huge.
  - Avoidable death !!!!
Risk Factors for Pre-Eclampsia:

- Age
- Parity
- Race and Ethnicity
- Genetic Predisposition
- Obesity
- Multiple Gestation
- H/O Pre-Eclampsia in previous pregnancy
Why are we worried about Severe Pre-Eclampsia ?????

GLOBAL vasospasm and ischaemia !!

HAEMATOLOGICAL
Thrombocytopenia
HELLP
DIC

KIDNEYS
ATN
ACN

BRAIN
Gross Haemorrhages
Edema
Thrombosis
Cortical Blindness

LIVER
Mild dysfn
HELLP, DIC
Haemorrhages

HEART
Myocardial Ischaemia

LUNGS
Pulmonary Edema

PLACENTA
Abruption
Insufficiency

MORTALITY
How frequent are the complications?

- Case fatality – 1.8%
- Major complications – 35%
Diagnosis of Severe Pre-Eclampsia (Gestational or SuperImposed):

- Diastolic BP > 110mmHg
- Systolic BP > 160mmHg
- Proteinuria ≥ 3+ (>5g in 24 hrs)
- Presence of:
  - Headache
  - Visual disturbances
  - Blurring of vision
  - Upper abdominal pain
Diagnosis of Severe Pre-Eclampsia (Gestational or Superimposed):

- Oliguria (≤ 400mL in 24 hrs)
- Convulsions
- Fetal Growth Restriction (<5 centile)
- Pulmonary Edema
- Laboratory evidence:
  - Elevated serum creatinine
  - Thrombocytopenia (<1,000,000/µL)
  - Elevated Serum Transaminase (>70U/L)
Diagnosis of Severe Pre-Eclampsia (Gestational or Superimposed):

- Signs of Clonus
- Papilloedema
- Liver tenderness

RCOG 2006
Diagnosis of Severe Pre-Eclampsia
Special points:

Proteinuria:
- Dipstick method – Screening test
  - Confirm with spot protein creatinine ratio
  - or 24 hrs urinary protein

BP measurement:
- Lady – rested, sitting at 45 degrees
- Cuff size and level
- Multiple readings
- Korotkoff’s 5
Management Principles:

Delivery is the ONLY available CURE for Pre-Eclampsia!!

- Termination of Pregnancy with LEAST harm to mother and baby
- COMPLETE restoration of health of mother
- PREFERABLY – Birth of an Infant who subsequently thrives
Management Considerations:

Delivery is the ONLY available CURE for Pre-Eclampsia!!

- Maternal and Fetal condition on admission
- Gestational Age
- Severity of disease process
- Bishop’s score
- Maternal desire
SEVERE PRE-ECLAMPSIA:

INITIAL ASSESSMENT

STABILISATION

DELIVERY

EXPECTANT MANAGEMENT
Mx of Severe Pre Eclampsia:
Initial Assessment -

- Admission in OB ICU
- Assessment –
  - History –
    - Premonitory symptoms
    - Fetal movements
  - Examination –
    - Blood Pressure
    - Respiratory System
    - Urine Output
Mx of Severe Pre Eclampsia: Initial Assessment -

- Lab evaluation:
  - S. creatinine
  - Liver Function Test
  - Counts

- Fetal Assessment –
  - USG
    - Amniotic Fluid Index
    - Doppler
  - NST
Mx of Severe Pre Eclampsia: Stabilisation of Patient -

Prevention of Seizures

Emergency Antihypertensive treatment
Prevention of Seizures: Is it really important ???????

- Maternal Complications with Eclampsia:
  - Placental abruption – 10%
  - Neurological deficits – 7%
  - Aspiration pneumonia – 5%
  - Pulmonary Edema – 5%
  - Cardiopulmonary arrest – 4%
  - Acute Renal failure – 4%
  - Maternal death – 1%

Mattar and Sibai (2000)
Can seizures be prevented in Severe Pre-Eclampsia?

<table>
<thead>
<tr>
<th>Study</th>
<th>Women with seizures/Total number treated</th>
<th>Mag Sulph (%)</th>
<th>Control Rx (%)</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coetzee (1998)</td>
<td></td>
<td>1/345 (0.3)</td>
<td>Placebo 11/340 (3.2)</td>
<td>RR=0.09 (0.1-0.69)</td>
</tr>
<tr>
<td>Magpie Trial (2002)</td>
<td></td>
<td>40/5055 (0.8)</td>
<td>Placebo 96/5055 (1.9)</td>
<td>RR=0.42 (0.26-0.60)</td>
</tr>
<tr>
<td>Belfort (2003)</td>
<td></td>
<td>7/831 (0.8)</td>
<td>Nimodipine 21/819 (2.6)</td>
<td>RR=0.33 (0.14-0.77)</td>
</tr>
</tbody>
</table>
Prevention of Seizures: Which drug?

- **Magnesium Sulphate** – drug of choice
- Phenytoin
  - Magnesium Sulphate vs Phenytoin:
    - Magnesium Sulphate is BETTER than Phenytoin
      - Lucas et al 1995
- Nimodipine
  - Magnesium Sulphate vs Nimodipine:
    - Magnesium Sulphate is BETTER than Nimodipine
      - Belfort et al 2003
Magnesium sulfate for Prevention of Seizures:

- **Loading dose:**
  - 4-6 g (20-30mL) of 20% soln in 100mL of Normal Saline over 15-20 mins.

- **Maintenance dose:**
  - Intramuscular injections:
    - 10g with loading dose
    - 5g 4hrly provided
  - Intravenous injections:
    - 2g/h infusion
Emergency Antihypertensive therapy:

- **When** ??? –
  - SBP ≥ 160 mmHg
  - DBP ≥ 110 mmHg

- **Goal**:
  - SBP – between 140 to 150 mm Hg
  - DBP – between 90 to 100 mm Hg
### Emergency Antihypertensive therapy in Severe Pre-Eclampsia:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
<th>Directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydralazine</td>
<td>5mg IV</td>
<td>Repeat in 10 mins and then 10mg IV every 20 min till BP stabilizes</td>
</tr>
<tr>
<td>Labetalol</td>
<td>10-20mg IV push</td>
<td>Repeat every 10-20 min, doubling dose each time till max 220 mg has been given</td>
</tr>
<tr>
<td>Nifedipine</td>
<td>10mg oral</td>
<td>Repeat 20 mins later 10-20 mg 4-6hrly Max – 120mg/day</td>
</tr>
</tbody>
</table>

Avoid Sublingual Nifedipine
Avoid Labetalol in Asthmatics
Emergency Antihypertensive therapy in Severe Pre-Eclampsia:

- If target BP is not reached with maximum dose of one agent—another agent may be added.
- True Hypertensive crisis with risk of Hypertensive Encephalopathy (BP > 240/140) – Sodium nitroprusside under expert supervision.
Oh what to to, what to dooo?
Can Delivery be delayed with Severe Pre Eclampsia ????

Delivery is the ONLY available CURE for Pre-Eclampsia !!

- Termination of Pregnancy with LEAST harm to mother and baby
- PREFERABLY – Birth of an Infant who subsequently thrives
- COMPLETE restoration of health of mother
Can Delivery be **delayed** with Severe Pre Eclampsia ????

- **Outcomes**:
  - Maternal
  - Perinatal

- **Groups**:
  - Immediate delivery after stabilisation
  - Delayed delivery

- **Gestational age**:
  - 28-34 weeks
  - 24-34 weeks
  - <24 weeks
Delayed delivery in 24-34 weeks pregnancy with Severe Pre-Eclampsia
Maternal Outcome in Expectant Mx b/w 24-34 wks:

<table>
<thead>
<tr>
<th>Study</th>
<th>No.</th>
<th>Days gained</th>
<th>Placental abruption (%)</th>
<th>HELL P syndr (%)</th>
<th>Pulmonary edema (%)</th>
<th>ARF (%)</th>
<th>Eclampsia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall(2001)</td>
<td>340</td>
<td>11</td>
<td>20</td>
<td>5.2</td>
<td>2.1</td>
<td>1.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Vigil(2003)</td>
<td>129</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>2.3</td>
<td>1.6</td>
<td>0</td>
</tr>
<tr>
<td>Haddad(2004)</td>
<td>239</td>
<td>5</td>
<td>8.7</td>
<td>14</td>
<td>3.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oettle(2005)</td>
<td>131</td>
<td>11.6</td>
<td>23</td>
<td>4.6</td>
<td>0.8</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Shear(2005)</td>
<td>155</td>
<td>5.3</td>
<td>5.8</td>
<td>27</td>
<td>3.9</td>
<td>NS</td>
<td>1.9</td>
</tr>
<tr>
<td>Gazevoort(2005)</td>
<td>216</td>
<td>11</td>
<td>1.8</td>
<td>18</td>
<td>3.6</td>
<td>NS</td>
<td>1.8</td>
</tr>
<tr>
<td>Bombrs(2009)</td>
<td>66</td>
<td>5</td>
<td>11</td>
<td>8</td>
<td>9</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
Maternal Outcome in Expectant Mx b/w 24-34 wks:

<table>
<thead>
<tr>
<th>Study</th>
<th>No.</th>
<th>Days gained</th>
<th>Placental abruption (%)</th>
<th>HELLP syndr (%)</th>
<th>Pulmonary edema (%)</th>
<th>ARF (%)</th>
<th>Eclampsia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHTED AVERAGES</td>
<td>1276</td>
<td>8.7</td>
<td>11</td>
<td>13.3</td>
<td>3.1</td>
<td>1.4</td>
<td>1.21.0</td>
</tr>
</tbody>
</table>

7%  2% -6%
### Perinatal Outcome in Expectant Mx between 24-34 wks:

<table>
<thead>
<tr>
<th>Study</th>
<th>No.</th>
<th>SGA (%)</th>
<th>Perinatal Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall(2001)</td>
<td>340</td>
<td>36</td>
<td>9.0</td>
</tr>
<tr>
<td>Vigil(2003)</td>
<td>129</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>Haddad(2004)</td>
<td>239</td>
<td>24</td>
<td>5.4</td>
</tr>
<tr>
<td>Oettle(2005)</td>
<td>131</td>
<td>NS</td>
<td>13.8</td>
</tr>
<tr>
<td>Shear(2005)</td>
<td>155</td>
<td>62</td>
<td>3.9</td>
</tr>
<tr>
<td>Gazevoort(2005)</td>
<td>216</td>
<td>94</td>
<td>8</td>
</tr>
<tr>
<td>Bombrys(2009)</td>
<td>66</td>
<td>27</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>WEIGHTED AVERAGE</strong></td>
<td>1276</td>
<td>43</td>
<td>9</td>
</tr>
</tbody>
</table>
Delayed delivery in < 28 weeks pregnancy with Severe Pre-Eclampsia
### Outcome in Expectant Mx before 28 wks:

<table>
<thead>
<tr>
<th>Study</th>
<th>No.</th>
<th>Maternal Complications (%)</th>
<th>Perinatal Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall(2001)</td>
<td>8</td>
<td>36</td>
<td>88</td>
</tr>
<tr>
<td>Gaugler(2006)</td>
<td>26</td>
<td>65</td>
<td>82</td>
</tr>
<tr>
<td>Budden(2006)</td>
<td>31</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>Bombrys(2008)</td>
<td>46</td>
<td>38-64</td>
<td>43</td>
</tr>
<tr>
<td>Jenkins(2002)</td>
<td>39</td>
<td>54</td>
<td>90</td>
</tr>
<tr>
<td><strong>WEIGHTED AVERAGE</strong></td>
<td><strong>140</strong></td>
<td><strong>60</strong></td>
<td><strong>65</strong></td>
</tr>
</tbody>
</table>
Risks versus Benefits of Delayed delivery in Severe Pre-Eclampsia remote from term:

- Maternal safety is the overriding reason to terminate pregnancies with severe preeclampsia.
- The average prolongation of pregnancy by about one week does not markedly improve perinatal outcomes !!!
- Expectant management is not beneficial for the mother, in fact it is more harmful !!!!!!!!!!!
Algorhythm for Severe PreEclampsia remote from term:

<24 weeks:
- Deliver
- **NO** Expectant Mx

28 to 34 weeks:
- Deliver
- Expectant Mx till 24 hrs after steroids

24 to 28 weeks:
- Deliver
- Expectant Mx till:
  - 24 hrs after steroids or
  - possible (34 weeks)
Contra-Indications of Expectant Mx in Severe Pre-Eclampsia remote from term:

- **MATERNAL:**
  - Persistent headache or visual changes, eclampsia
  - Shortness of breath, chest tightness with rales and/or $\text{SaO}_2 < 94\%$, Pulmonary edema.
  - Uncontrolled severe hypertension despite treatment
  - Oliguria <500mL/24hr or serum creatinine ≥1.5mg/dL.
  - Platelets <1,00,000/µL
  - Suspected abruption, progressive labour, &/or ruptured membranes

Sibai and Barton 2007
Contra-Indications of Expectant Mx in Severe Pre-Eclampsia remote from term:

- **FETAL**:
  - Severe FGR <5 centile for EGA
  - Severe oligohydramnios – AFI <5cm
  - BPS ≤ 4 done 6 hrs apart
  - Reversed end diastolic flow in Umbilical artery
  - Fetal death

Sibai and Barton 2007
Expectant management in Severe Pre-Eclampsia <34 weeks:

- Bed rest
- Anti Hypertensive treatment
- Betamethasone
- Magnesium sulphate for 24 hrs
- BP 4hrly
- 12 hrly Urinary proteins
- Daily
  - Fetal Movement Count
  - Weight
  - Input Output charts
  - NST
- Daily / Alternate day – Lab reports:
  - AST, ALT, LDH, Platelet count, creatinine, bilirubin
- Biweekly - Umbilical and Middle Cerebral Doppler
- Fortnightly - USG for fetal growth
Glucocorticoids (Betamethasone) for Lung maturation in Severe Pre-Eclampsia:

- 218 women with severe preeclampsia between 26 and 34 weeks were randomised into BM and placebo groups:
  - Significant decrease in neonatal complications including respiratory distress, Intraventricular haemorrhage, death
  - BUT two maternal deaths and 18 stillbirths.
    - Amorim and associates 1999
Delivery Considerations:

- Favourable cervix - Induction of Labour
- Unfavourable cervix –
  - Cervical ripening with Prostaglandins
  - CS

IN EQUIPPED CENTRE
Delivery Considerations:

- Continue Magnesium sulphate prophylaxis
- Continue Anti Hypertensives
- Controlled fluids infusion (<100mL/hr)
- Strict Input Output charting
- Continuous Electronic fetal monitoring
- Frequent maternal monitoring
Delivery Considerations:

- Augmentation with concentrated Oxytocin soln
- Labour analgesia
  - Avoid Epidural in presence of Thrombocytopenia
- HELLP –
  - 10 units pooled or 1 unit single donor platelets if platelet count <1,00,000/µL
  - Cross match blood
- Assist 2nd stage
- 3rd stage – Oxytocin infusion or Misoprostol
Delivery Considerations:

- Discuss and decide policy for Fetal distress
Delivery Considerations: Remember -

- Less tolerant of even normal blood loss than are normotensive patients.
- Suspect PPH if Oliguria is noted after delivery with average blood loss - Evaluate haematocrit frequently.
Anaesthesia/ Analgesia Considerations: General/Epidural/Combined-Spinal Epidural

- All three are equally good if adequate measures are taken to ensure patient safety.
- Judicious fluid administration.
Postpartum Management:

- Close observation for 3-4 days.
  - 25-30% cases of eclampsia (Continue Magnesium Sulphate for 24 hrs)
  - 30% HELLP cases
- Continue anti-hypertensives (Labetalol, Nifedipine) till needed (upto 3mths).
- If Hypertension persists beyond 6 wks – look for renal disease.
Furosemide considerations:

- Definitely indicated in PULMONARY EDEMA -
- For hastening Postpartum BP control ???????
- Consider if postpartum weight is in excess of the last prenatal weight and there is persistent hypertension.
Invasive Hemodynamic Monitoring:

- ACOG:
  - Severe preeclampsia with cardiac or renal disease
  - Refractory hypertension with Oliguria
  - Pulmonary Edema
Postpartum Counselling:

• Preeclampsia in 1st pregnancy:
  • 20% risk of recurrence in next pregnancy.

• Severe Preeclampsia in 1st pregnancy:
  • 30% risk of recurrence in next pregnancy.

• Severe Preeclampsia in midtrimester:
  • 65% risk of recurrence in next pregnancy.

• Two episodes of Severe Preeclampsia in midtrimester:
  • Risk of Chronic hypertension and renal disease
Severe PET

Mild PET – may rapidly progress to Severe disease
Severe PreEclampsia remote from term:
THANK YOU