Hypertensive disorders in pregnancy

- Almost 10 - 12% of antenatal patients are diagnosed as hypertensive
- Directly responsible for 20% of maternal deaths
- Perinatal mortality increased
- 25% of all inductions in the labour ward are because of hypertensive disorders of pregnancy
**Etiology:** Still an enigma

Many theories: Increased vascular sensitivity to angiotensin II

- Imbalance in prostaglandin production
  - \(\downarrow\) Prostacyclin / Thromboxane \(\uparrow\)
    - \(\downarrow\) Nitric oxide / Endothelins \(\uparrow\)
  - \(\uparrow\) vascular endothelial growth factor (VEGF) (placental)

- Immunological factor

- Genetic predisposition
Pathophysiology

Vasospasm in all organs decreased placental perfusion

The pathogenesis of preeclampsia may incorporate two stages:

- Deficient trophoblast invasion of spiral arteries

- Widespread oxidative stress and inflammatory response

- Particularly targeting the endothelial cells resulting in a multisystem disorder
The new classification for hypertensive disorders:

- **Gestational hypertension**
  
  BP 140/90 or more for 1st time during pregnancy. No proteinuria

- **Preeclampsia**
  
  BP 140/90 or more after 20 weeks
  Proteinuria > 300 mg / 24 hrs or ≥ 1+ on dipstick

  Severe: 160/110
  Proteinuria 2.0 G / 24 hrs (or 2+ on dipstick)
  S. creatinine 1.2 mg / dl or mm
  Platlets < 100,000 /m³
  Increased LDH
  Elevated SGOT, SGPT
  Persistent epigastric pain
**Eclampsia**

New onset seizure in a woman with preeclampsia

**Superimposed preeclampsia** (on chronic hypertension)

New onset proteinuria $\geq 300$ mg / 24 hrs or a sudden increase in proteinuria or rise in BP $> 30/15$ or platelet count $< 100,000$ in a woman with previous hypertension and proteinuria before 20 weeks gestation.

**Chronic hypertension**

BP $\geq 140/90$ Hg before pregnancy or before 20 weeks of pregnancy
Clinical Practice

1. Some precautions for checking BP
   a) Should be with mercury/aneroid sphygmomanometer or validated automated device
   b) Appropriate cuff size should be used. Bigger is better than smaller
   c) Setting - relaxed quiet environment

Position

Lying at a 45 degree angle or sitting. Right or left arm (higher value if difference is > 10 mm)
Dependent arm if in a lateral position
Korotkoff 1st (systolic) and 5th (diastolic) is to be taken
Management

- BP 140/90 or more (Gestational hypertension)
- In addition proteinuria > 300 mg / 24 hours Preeclampsia or + or more on dipstick
- Hb, PCV, Platelet count, PBF
- Urine : albumin, sugar, M/E
- 24 hours urine protein
- Renal function tests:
  - Blood urea
  - Serum creatinine
  - S. uric acid
- Liver function test

To check for haemolysis elevated liver enzyme low platelet I.e. HELLP syndrome

- Fundus examination

- GTT (All hypertensive patients are also at high risk for GDM)
Maternal:

- History and watch out for ominous signs
- BP monitoring 6 hourly
- Urinary output / 24 hours
- Urine alb. OD
- Fetal monitoring
  - Fundal ht / girth
  - Fetal kick chart
  - Biophysical profile (every week)
  - NST more frequently-
Role of antihypertensives drugs

If diastolic BP $\geq 100$ mm (ideally $\geq 105$ mm Hg), antihypertensive drugs are started

Choice

- M-dopa
- Labetolol are equally good and can be used
- Nifedipene

If patient is <36 weeks and hypertension is such that she may require preterm IOL, Betamethasone for enhancing lung maturity should be administered
Mild Preeclampsia / Gestational hypertension

- Hospital / home management
- Bed rest
- Home BP records and fetal kick chart
- Monitor twice a week
- Consider induction of labour at 37 weeks
Management: Mild preeclampsia

≥ 37 weeks at diagnosis

- In hospital
- Bed rest
- Maternal and fetal monitoring
- Antenatal steroids ≤ 34 weeks
- Antihypertensive therapy
- Deliver
- Antihypertensives as needed during labour

< 37 weeks

- Home / Office
- + / - bed rest
- Antihypertensive therapy
- Deliver
Indications for termination

If the patient’s clinical profile is worsening

- BP not controlled even with 2 drugs
- Increasing proteinuria
- Oligouria
- Ominous signs
- BPP < 4 or reversal of diastolic flow on doppler
Morbidity associated with hypertensive disease

Maternal:
- Abruptio placenta
- Central Nervous System Event (e.g. stroke, seizure)
- End organ dysfunction like renal tubular necrosis, acute fatty liver, ac. CHF

Coagulopathy  **HELP**

Fetal / Neonatal
- Sequelae of Prematurity
- Ischaemic encephalopathy
- Intrauterine growth restriction
HELPP (in almost 10% of severe preeclampsia - eclampsia)

Haemolysis: Schistocytes on the peripheral blood film lactic dehydrogenase > 600 μ/L, total bilirubin > 1.2 mg

Elevated Liver Enzymes  SGOT / SGPT > 70 μ/L

Low Platelets < 100,000/mm³

Management:
- High dose corticosteroids dexamethasone 10 mg 12 hourly
- Early delivery
Eclampsia

New onset seizure in a woman with preeclampsia

**Incidence:**
- 1 in 100 India
- 1 in 2000 USA

- Delivery
- Mag sulphate (anticonvulsant)
- Antihypertensive
Maternal mortality in Eclampsia

- 489 eclampsia patients
- 22,684 deliveries
- Inc. 2.13%
- 20 patients died
- Mortality of 4.04%
Mortality

Maximum mortality was in:

- Young women < 20 years
- POG < 28 weeks
- Induction to delivery interval > 12 hours
- Deeply comatose between convulsions

Recent recommendations for deeply comatose patients:

- Dexamethasone 32 mg I/V stat and then 8 mg 6 hourly helps reduce cerebral edema.
Can pregnancy induced hypertension be predicted?

Can it be prevented?

a) High risk factors for PIH
   - Primigravide sp age > 35, < 18 years
   - Pre existing hypertension
   - Medical disorders like diabetes
   - Obesity
   - Pace and ethnicity (African - America)
   - Genetic (More if mother / sister had PIH)
   - Multiple pregnancy
   - Subfertility patients sp PCOs patients are at increased risk
Tests for predicting PIH

- Mean arterial pressure $\geq 90$ mm in 2nd trimester
- Roll over Test
- Angiotensin II Sensitivity Test (Research tool)
- Urine human chorionic Gonadotropin
  $\beta$-subunit core Fragment ($\uparrow$ predicts PIH)
- Hypocalciuria: A level $< 195$ mg / 24 hours urine (87% specificity)
- Urinary Kallikrein - Creatinine Ratio
- Micro albuminuria - (20 - 200 $\mu$g 50%)
- MSAFP: Increase in presence of normal fetus - increased incidence of PIH
- Elevated hCG - $\uparrow$ PIH
- Leptin - Increased levels - $\uparrow$ Preeclampsia
RCOG Guidelines

- Antiplatelet therapy, particularly low dose aspirin (75 mg) reduces the risk of preeclampsia by about 15% for women at both low and high risk. There is a similar reduction in the risk of perinatal death. Aspirin should be considered particularly for women at high risk. In countries with a high prevalence of pre eclampsia more widespread use may be worthwhile. (Grade B recom.)

- Data from small trials point towards a protective role of antioxidants like Vit C and E. Large trials are underway
ACOG Guidelines

- No role of low dose aspirin or calcium supplementation in preventing PIH

- Antioxidants in form of 1000 mg Vit C and 400 mg Vit E is under evaluation