

Learning objectives

- To understand the **classification** of hypertension in pregnancy
- To be able to differentiate the different **risks associated** with various types of hypertensive disorders in pregnancy
- To understand the **pathophysiology** of pre-eclampsia
- To be aware of the clinical presentation of PE & understand the principles of management
- To understand the long term risks to both mother & baby from PE

Introduction

- HTN is common in pregnancy.
 - Approx. 1/10 women will have raised BP prior to delivery
 - Gestational HTN - In majority & is benign
 - 1/3 women will develop pre-eclampsia- leading cause of maternal death
- WHO estimates:** 50,000 -75,000 women globally die of this condition
- Women with chronic HTN assoc. with increased risks to mother & baby

Classification

- Non-proteinuric pregnancy induced HTN-
 - Elevated BP during pregnancy
- Pre-eclampsia-
 - Hypertension in pregnancy
 - Proteinuria
 - End organ damage
- Chronic hypertension-
 - Elevated BP prior to pregnancy

Gestational hypertension

- Elevated BP after 20 weeks
- No proteinuria or evidence of preeclampsia
- Not associated with adverse pregnancy outcome
- Mild to moderate increase in BP do not require T/M
- 1/3 will progress to pre-eclampsia



Chronic hypertension

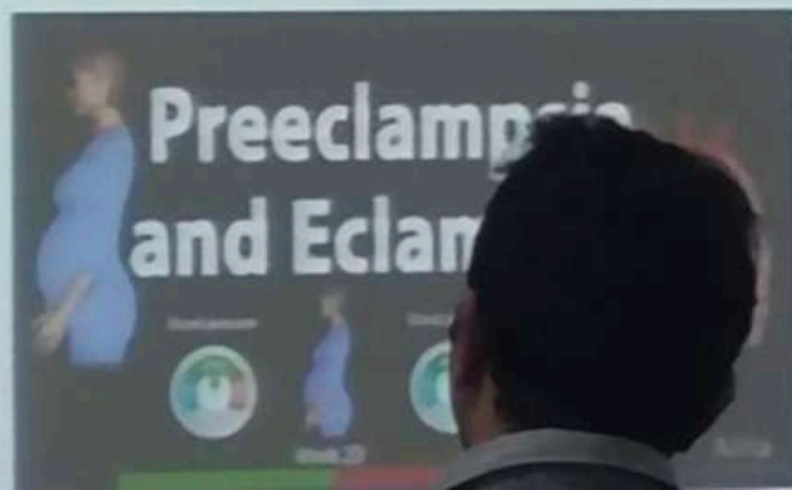
- Women who have confirmed hypertension in the first half of pregnancy.
- HTN before 20 weeks
- Majority have Essential HTN
- Predisposes to later development of pre-eclampsia

Preeclampsia

- Multi-system disorder of pregnancy
- Complicates 2-3% of pregnancies
- Leading cause of death in low resource settings
- Hypertension
- Proteinuria
- End-organ dysfunction

Definition

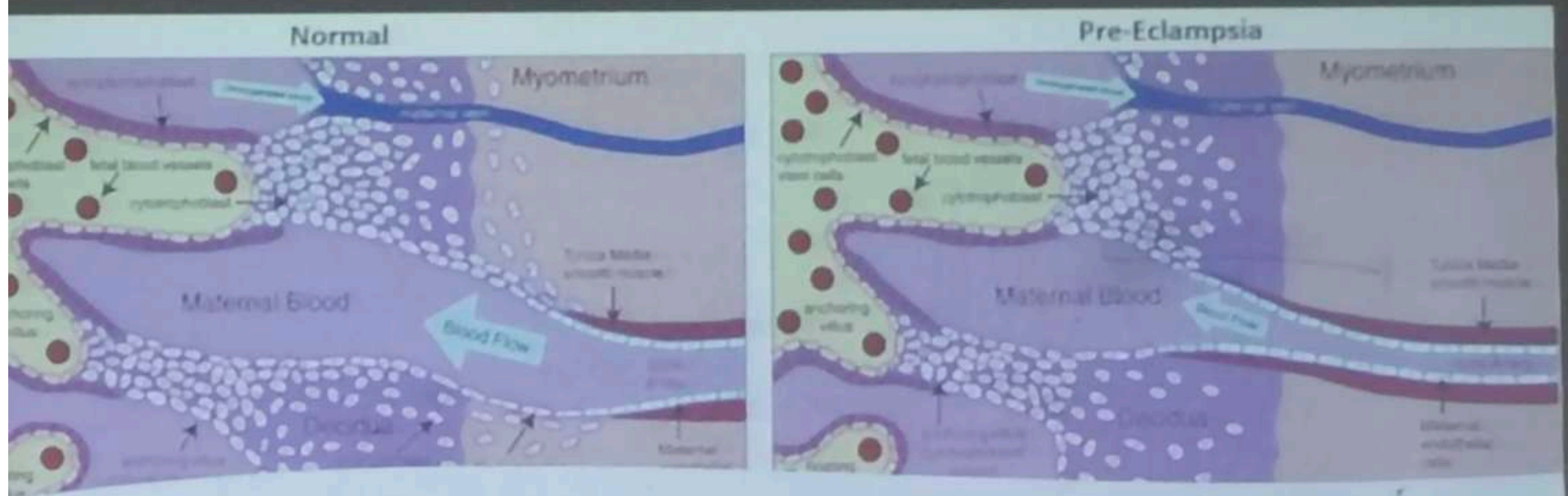
- PE is defined as hypertension of at least 140/90 mmHg recorded on at least two separate occasions, at least 4 hours apart
- The presence of 300 mg protein in a 24 hour collection of urine
- Arising after 20th week of pregnancy in a previously normotensive woman
- Resolving completely by the sixth postpartum week



Pathogenesis

- Disorder of the placenta
- Normally trophoblast invades/transforms spiral arteries
- Abnormal invasion/transformation \rightarrow PE
- Placental under-perfusion
- Leads to release of circulating substances
- Diffuse maternal endothelial dysfunction
- Vasospasm & coagulation
- Resolves with delivery (placental removal)





Pathogenesis-
contd.

- Extravillous trophoblast fails to penetrate myometrium
- Spiral arteries do not develop normally
- Remain narrow---> placental hypoperfusion
- Placental biopsy: Fibrinoid necrosis of vessels

Pathophysiology of PE

- CVS: Marked peripheral vasoconstriction → HTN
- Renal system: Glomerular endotheliosis → loss of albumin, edema
- Haematological system: Increase fibrin & reduction in platelet count
- Liver: Subendothelial fibrin deposition →
 - Haemolysis
 - Elevation of liver enzymes
 - Low platelets d/t platelet consumption (HELLP)
- Neurological: Vasospasm & cerebral edema

DEVELOPMENT OF ABNORMAL PLACENTA

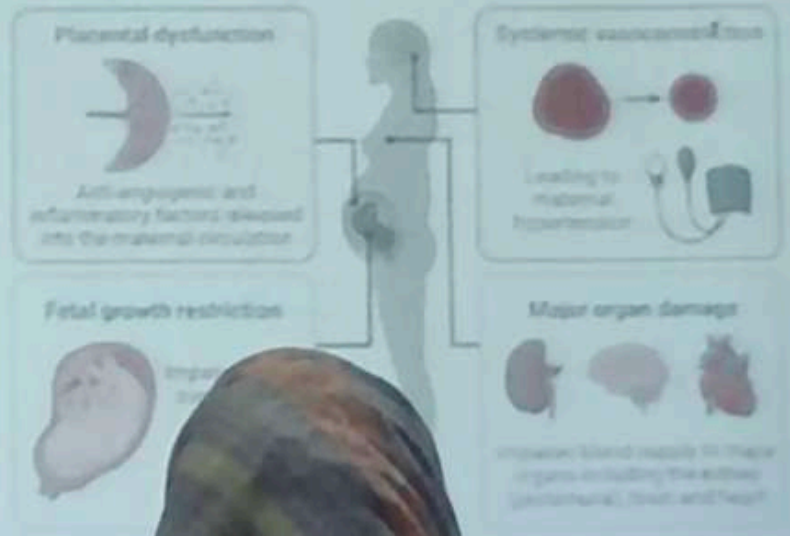
PREECLAMPSIA



Narrower = LESS BLOOD

POORLY PERFORMING PLACENTA

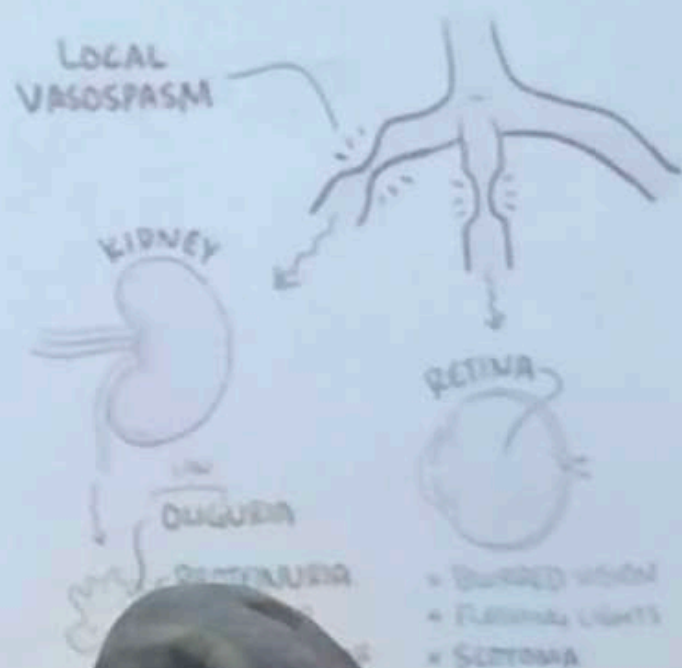
- INTRAUTERINE GROWTH RESTRICTION
- FETAL DEATH
- RELEASES PRO-INFLAMMATORY PROTEINS



Clinical presentation

Classical symptoms:

- Frontal headache
- Visual disturbance
- Epigastric pain
- Asymptomatic, flu-like symptoms



Contd.

- Hypertension -- first sign, maybe absent or transient until late stage
- Dependent edema of feet
- Progressive edema of face & hands
- Epigastric tenderness – liver involvement
- Hyperreflexia & clonus
- Urine testing for protein

SIGNS & SYMPTOMS OF PREECLAMPSIA

MILD PREECLAMPSIA

ELEVATED BLOOD PRESSURE



ELEVATED PROTEIN IN URINE



WEIGHT GAIN EXCEEDING 2 LBS/WK

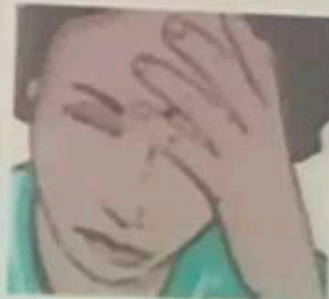


WATER RETENTION & SWELLING



SEVERE PREECLAMPSIA

HEADACHES



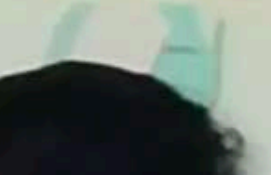
CHANGES IN VISION



NAUSEA/VOMITING



PAIN IN ABDOMEN & BACK



Principles of management

- Early recognition of symptomless syndrome
- Awareness of the seriousness of the condition in severe form
- Adherence to guidelines for admission to hospital
 - Investigations
 - Antihypertensives
 - Anticonvulsants
- Well timed delivery to pre-empt serious fetal or maternal complications
- Postnatal follow-up
- Counselling for future pregnancy

Risk factors of PE

- First pregnancy
- Multiparous - previous H/O PE
- PE in previous pregnancy
- 10 yrs. or more since last baby
- Age 40yrs. or more
- BMI of 35 or more
- Family history
- Booking diastolic BP > 80 mmHg
- Booking proteinuria
- Multiple pregnancy

Risk factors

Maternal conditions (prior to pregnancy)

- Diabetes
- HTN
- Obesity
- Chronic kidney disease
- Lupus/antiphospholipid syndrome

Investigations

To monitor maternal complications:

- Full blood count –
 - Haemoglobin
 - Platelet count (falling)
 - Haematocrit (rising)
- Clotting studies --
- Serum renal profile – urea, creatinine, uric acid
- Serum liver profile -- Bilirubin, SGPT, SGOT
- Urine -- Frequent proteinuria quantification

Contd.

To monitor fetal complications:

- **Ultrasound assessment of :**
 - Fetal size
 - Amniotic fluid volume
 - Maternal & fetal dopplers
- **Antenatal CTG**



Treatment of hypertension

Aim:

- To lower the BP & reduce the risk of maternal CVA without reducing uterine blood flow & compromising the fetus
- Methyldopa – Centrally acting, oral
- Labetalol – Alpha & beta blocking- first choice
- Nifedipine – Calcium channel blocker, oral
- Hydralazine – In fulminating disease, IV

Preeclampsia- Complications

- Pulmonary edema
- Heart failure
- Liver haematoma with/without rupture
- Liver failure
- Disseminated intravascular coagulation
- Stroke
- Dialysis (advanced renal failure)

HELLP syndrome

- Variant of preeclampsia
- Hemolysis
- Elevated liver enzymes
- Low platelet count
- Complication of preeclampsia (severe form)
- Coagulation activation & liver infarction

Presentation of HELLP

- Typically epigastric pain, nausea & vomiting
- HTN may be mild or absent
- Associated with complications of:
 - ARF
 - Placental abruption
 - Stillbirth

Eclampsia

- Presence of seizures in a woman with PE & in the absence of any other identifiable cause
- Generalized tonic-clonic seizures
- Vascular dysfunction
- Systemic inflammation involving the
 - Brain
 - Liver
 - Kidneys
- May lead to coma & death
- DIC
- Renal failure

Risk factors

- Uncontrolled HTN
- Primigravida
- Obesity
- Black ethnicity
- H/O DM
- Age < 20 years

Warning signs

- Epigastric pain & right upper quadrant tenderness
- Headache
- Uncontrolled hypertension
- Agitation
- Hyper-reflexia & clonus
- Fascial (periorbital) edema
- Poor urine output
- Papilloedema



Management of eclampsia



- Call senior help & emergency alert team
- Airway, breathing, circulation
- Anticonvulsant of choice: **Magnesium sulfate**
- Loading dose of 4 g is given followed by maintenance of 1 gm/hr. for 24 hrs. after delivery
- Overdose: Respiratory depression, cardiac arrest
- Antidote: 10ml Calcium gluconate
- Definitive treatment: Delivery of baby