

Hypertension in pregnancy includes

Pre-existing hypertension (chronic or secondary)

BP>140/90mmHg on 2 occ or BP>160/110mmHg at any time pre-pregnancy or at booking (<20w).

Pregnancy induced hypertension (PIH, Gestational Hypertension)

BP>140/90mmHg on 2 occ or BP>160/110mmHg at >20w gestation. Resolves <3mo postpartum.

Pre-eclampsia

PIH in association with:

- Proteinuria (>0.3g in 24h) and/or generalised oedema.
- Renal insufficiency (oliguria or Cr >90micromol/L)
- Liver disease (abnormal LFT or RUQ pain)
- Neurological signs (hyperreflexia+clonus, headache, visual scotomas, or eclampsia)
- Haematological abnormalities: ↓plts, DIC, haemolysis.
- Foetal growth retardation
- Also considered if BP not reached threshold but ↑ by 30mmg sys or 15mmHg dia.
- Oedema (though not included in some definitions)

Pre-eclampsia superimposed on chronic HT

Eclampsia

- Defined as convulsions/coma superimposed on pre-eclampsia

Epidemiology

- Chronic hypertension affects 1 to 5% of pregnancies.
- PIH affects up to 10% of all pregnancies. Up to 25% first pregnancies
- Pre-eclampsia in about 5% pregnancies
- Eclampsia ~0.5% pregnancies. Almost 50% seizures occur post-partum.

Risk Factors for Pre-eclampsia

- First pregnancy, or first pregnancy with new partner, or ≥10y since last baby
- Pre-eclampsia in any previous pregnancy
- FHx pre-eclampsia (in mother or sister)
- Age ≥40y
- BMI≥35
- Booking BP_{dia} ≥80mmHg or proteinuria ≥1+ or ≥0.3g/24h
- Multiple pregnancy
- Hydatiform mole
- Medical conditions: Pre-existing HT, renal disease, DM, SLE, antiphospholipid antibodies

Pathophysiology

Dysfunction of uteroplacental bed → vasospasm, ischaemia & thrombosis → mother & foetal Cx.

Presentation

- Most women asymptomatic and condition found only on routine monitoring of BP & urine.

Pre-eclampsia

- Mild: ↑BP by 30/15mmHg or BP>140/90mmHg, oedema, proteinuria 0-1+
- Moderate: 140/100 < BP < 160/110, oedema, proteinuria 2+
- Severe: BP>160/110mmHg oedema, proteinuria 3-4+ (>5g/24h), end organ dysfunction (headache - usually frontal, visual disturbance, papilloedema, clonus, liver tenderness or

deranged LFTs, plt<100, DIC, epigastric pain and/or vomiting, HELLP syndrome, foetal distress - reduced fetal movements, IUGR)

Eclampsia - convulsions or coma assoc with features of pre-eclampsia.

Differential diagnosis

- Secondary hypertension (e.g. pheochromocytoma) is rare in pregnancy.
- Other GI or renal disorders (e.g. pancreatitis, appendicitis, GN)
- Acute fatty liver of pregnancy
- Systemic lupus erythematosus
- Autoimmune thrombocytopenia purpura
- Encephalitis
- Cerebral venous thrombosis
- Cerebral haemorrhage

Investigations

Urine: spot/24h urine for proteinuria; MC&S

Bloods: FBC, UEC, CMP, BSL, LFT, urate (correlates with pre-eclampsia), coags / DIC screen.

Imaging: USS (foetal assessment, Doppler of umbilical artery), CXR if ?ARDS or aspiration if seizures, CT/MRI if prolonged seizures/↓LOC.

ECG: if ?myocardial dysfunction

CTG

Special tests for possible secondary hypertension if indicated

Management

Prevention of severe PIH/pre-eclampsia

- Identification and monitoring for those women with known risk factors at booking.
- Early recognition and appropriate action for those with features of pre-eclampsia.
- Low-dose **aspirin**, has small to moderate benefit
- Calcium supplementation: may ↓risk of high BP in pregnancy if at increased risk.
- Antihypertensive treatment ± admission is recommended BP>160/110mmHg
 - **Methyldopa**, **labetalol**, **nifedipine** and **hydralazine** are most commonly used.
 - ACEI & ARBs should be avoided as may be associated with intrauterine death.
 - Low dose thiazides in women with pre-existing hypertension may be continued

Severe pre-eclampsia

- Positioning: As always in late pregnancy → left lateral tilt with right hip wedge.
- Monitoring: TPR, BP, SaO₂, neuro obs, CTG
- Antihypertensive: Aim for BP drop of 30/15mmHg to not less than 140/85
 - Acutely:
 - **Labetalol**: 20-50mg IV bolus over min may rpt after 10-15min
 - **Hydralazine**: 5-10mg IV bolus ± infusion of 2-10mg/hr
 - **Nifedipine**: 10-20mg capsule PO q45min to max 80mg in first 2hr
 - **Diazoxide** if true hypertensive crisis 100mg IV bolus q1-2min
 - Maintenance: PO **nifedipine**, **labetalol**, **methyldopa** or **clonidine**
- Fluid balance:
 - Cautious use as risk of APO & cerebral oedema
 - However NS used for oliguria, maintenance and if antihypertensives too effective
- Prophylaxis of seizures:
 - If risk of eclampsia is thought to be high: **MgSO₄** 4g IV over 20min then 1g/hr.

- Check for hyporeflexia, hypoventilation and q6h Mg levels
- Overall best treatment for maternal pre-eclampsia is delivery of baby & placenta.
- Obstetric input as to optimal timing as balanced against foetal considerations.
- Indications for immediate delivery:
 - Eclampsia
 - Gestation > 37w
 - Uncontrollable HT
 - Abnormal CTG
 - Placental abruption
 - HELLP syndrome - Deteriorating LFTs/RF, progressive thrombocytopenia
 - Maternal demise
- If foetus 28-34w and able to delay delivery 24h, give **betamethasone** 11.4mg q12-24h for lung maturation.
- In 3rd stage give 5U IM/slow IV **Syntocinon**. (Avoid ergometrine or Syntometrine).

Management of eclampsia

- Resuscitation. ABCs & O₂. Left lateral position.
- Control of seizures:
 - **20% MgSO₄** 4g IV (20ml) over 5-10min then 1-2g/hr for 24hr after last seizure.
 - Recurrent seizures: can give further bolus of 2-4g.
 - Check for hyporeflexia, hypoventilation and q6h Mg levels (should be 4-7mmol/L)
 - If refractory seizures: options include **diazepam**, **phenytoin**, **phenobarbitone**, **thiopentone** + intubation & muscle relaxation pre-delivery.
- Treatment of hypertension as above & LSCS (usually) delivery as soon as mother stable

Complications

- Increased risk of placental abruption.
- Eclampsia often assoc with: HELLP syndrome (see below), DIC, RF, ARDS
- Neurological: coma, focal motor deficits and cortical blindness. ICH in 1-2%.

Prognosis

- Hypertensive diseases of pregnancy is a leading cause of direct maternal deaths
- Cx risk (e.g. pre-eclampsia, placental abruption, impaired fetal growth and premature birth) are increased in severe hypertension.
- Gestational hypertension: similar risks to normotensive women, but 40% of those presenting before 34w gestation will go on to develop pre-eclampsia.
- HT ± proteinuria is leading single risk factor in stillbirth.
- Pre-eclampsia is associated with IUGR, SGA, preterm delivery & RDS.
- Eclampsia mortality rate is 2% for mothers, 15-30% for foetuses.
- 35% of women with eclampsia will have at least one major complication.

HELLP Syndrome

Severe variant of pre-eclampsia with **H**aemolysis, **E**levated **L**iver enzymes & **L**ow **P**latelets.

Epidemiology

5-10% of pregnant women with mild-sev pre-eclampsia or eclampsia.

- It may occur well before term.
- HELLP may occur before or after (more commonly) pre-eclampsia is diagnosed
- It may occur in association with antiphospholipid syndrome.
- Unfortunately smoking in pregnancy is assoc with an 80% reduction in HELLP.

Presentation

Symptoms: N&V, epigastric pain prominent, symptoms of pre-eclampsia/eclampsia

Signs: Jaundice, RUQ tenderness, hepatomegaly, easy bruising/purpura

Investigations

As for pre-eclampsia above. Esp LFTs (AST& ALT usually ↑ but <500IU), FBC (↓Hb, ↓plt), blood film (evidence of haemolysis e.g. schistocytes), DIC screen (40% develop DIC)

Differential Diagnosis

- Acute fatty liver of pregnancy
- Thrombotic thrombocytopenic purpura
- Haemolytic uraemic syndrome
- Acute exacerbation of systemic lupus erythematosus

Management

As per pre-eclampsia

Deliver the baby: ASAP, even if premature, as liver function deteriorates rapidly

Pharmacological

- Dexamethasone - may benefit if 10mg bd pre-delivery & 5mg bd post-partum x48hr.
- Plasma exchange therapy has been successful if organ failure or refractory to Rx.
- Platelet transfusion may be req

Surgery

- Women with severe liver damage may need liver transplantation.

Complications

- The maternal liver may haemorrhage or rupture.
- Permanent liver damage or necrosis, which may need transplantation.
- Intraventricular haemorrhage with subsequent hydrocephalus has been reported.
- Retinal detachment and other eye problems have been reported.
- Transient diabetes insipidus may follow HELLP syndrome.

Prognosis

- If HELLP is not treated early up to 25% of women may develop serious complications.
- Maternal mortality 1-2%