Hypertension and pregnancy

Clinical Guideline Presentation v3.0

45 minutes
Towards CPD Hours
Learning outcomes

The participant will be able to outline, in relation to hypertension and pregnancy:

• Definitions and classification
• Risk factors for and diagnosis of pre-eclampsia
• Initial screening and testing recommendations
• Treatment of moderate and severe hypertension
• Indications for the use of magnesium sulfate
• Management of eclampsia
• Antenatal surveillance of mother and baby
• Intrapartum and postpartum management
• Discharge and follow-up advice
## Abbreviations

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>ACE</td>
<td>Angiotensin converting enzyme</td>
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<tr>
<td>BP</td>
<td>Blood pressure</td>
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<tr>
<td>CS</td>
<td>Caesarean section</td>
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<tr>
<td>CTG</td>
<td>Cardiotocography</td>
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<td>dBP</td>
<td>Diastolic blood pressure</td>
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<tr>
<td>DIC</td>
<td>Disseminated intravascular coagulation</td>
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<td>FBC</td>
<td>Full blood count</td>
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<td>HDP</td>
<td>Hypertensive disorders of pregnancy</td>
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<td>LDH</td>
<td>Lactate dehydrogenase</td>
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<td>NSAID</td>
<td>Non-steroidal anti-inflammatory drugs</td>
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<tr>
<td>PPH</td>
<td>Primary postpartum haemorrhage</td>
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<tr>
<td>sBP</td>
<td>Systolic blood pressure</td>
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<tr>
<td>USS</td>
<td>Ultrasound scan</td>
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<tr>
<td>VTE</td>
<td>Venous thromboembolism</td>
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## Definitions of hypertension

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Mild to moderate hypertension</td>
<td>$sBP \geq 140 \text{ mmHg (but less than 160 mmHg)}$ and/or $dBP \geq 90 \text{ mmHg (but less than 110 mmHg)}$</td>
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<tr>
<td>Severe hypertension</td>
<td>$sBP \geq 160$ and/or $dBP \geq 110 \text{ mmHg}$</td>
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**Classification of hypertension**

*known before pregnancy or in the first 20 weeks*

<table>
<thead>
<tr>
<th>Classification</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic hypertension in pregnancy (essential and secondary)</td>
<td>Hypertension confirmed pre-conception or prior to 20 weeks</td>
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<tr>
<td>White coat hypertension</td>
<td>Hypertension characterised by an elevated BP in a clinical setting and a normal BP at other times</td>
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<tr>
<td>Masked hypertension</td>
<td>Hypertension characterised by a normal BP in a clinical setting and an elevated BP at other times</td>
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</table>
# Classification of hypertension

*arising at, or after, 20 weeks gestation*

<table>
<thead>
<tr>
<th>Classification</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Gestational hypertension</td>
<td>New onset after 20 weeks without features of pre-eclampsia</td>
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<tr>
<td>Pre-eclampsia</td>
<td>Hypertension and involvement of one or more other organ systems and/or the fetus</td>
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<tr>
<td>Transient gestational hypertension</td>
<td>Hypertension that is detected in the clinical setting but settles after repeated readings</td>
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<tr>
<td>Pre-eclampsia superimposed on chronic hypertension</td>
<td>Pre-existing hypertension with systemic features of pre-eclampsia after 20 weeks gestation</td>
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</tbody>
</table>
Diagnosis of pre-eclampsia

• Raised BP is common but not always first manifestation
• Proteinuria is common but not mandatory for clinical diagnosis
• Pre-existing hypertension is a strong risk factor
# Features of pre-eclampsia

<table>
<thead>
<tr>
<th>Organ/System</th>
<th>Feature</th>
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<tbody>
<tr>
<td>Proteinuria</td>
<td>Protein: creatinine ratio ≥ 30 mg/mmol</td>
</tr>
<tr>
<td>Renal</td>
<td>Serum or plasma creatinine ≥ 90 micromol/L or oliguria</td>
</tr>
<tr>
<td>Haematological</td>
<td>Thrombocytopenia, haemolysis, raised bilirubin, raised LDH, decreased haptoglobin, DIC</td>
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<tr>
<td>Liver</td>
<td>New onset of raised transaminases (over 40 IU/L) with or without severe right upper quadrant pain</td>
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<tr>
<td>Pulmonary</td>
<td>Pulmonary oedema</td>
</tr>
<tr>
<td>Uteroplacental</td>
<td>Fetal growth restriction</td>
</tr>
<tr>
<td>Neurological</td>
<td>Severe headache, persistent visual disturbances, hyperreflexia convulsions (eclampsia), stroke</td>
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</tbody>
</table>
Risk assessment

• Assess all women with new hypertension after 20 weeks for signs and symptoms of pre-eclampsia
• The earlier the presentation and the more severe the hypertension, the more likely of progression to pre-eclampsia
• Currently, there is no single predictive tool for pre-eclampsia
### Risk factors for pre-eclampsia

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Associated Factor</th>
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<tbody>
<tr>
<td>Antiphospholipid syndrome</td>
<td>Previous history of pre-eclampsia</td>
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<tr>
<td>BP &gt;130/80 at booking</td>
<td>Pre-existing diabetes</td>
</tr>
<tr>
<td>Multiple pregnancy</td>
<td>Pre-existing kidney disease</td>
</tr>
<tr>
<td>&gt;10 years since last pregnancy</td>
<td>Chronic autoimmune disease</td>
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<tr>
<td>Nulliparity</td>
<td>Chronic hypertension</td>
</tr>
<tr>
<td>Raised body mass index (&gt;30 mg/kg2)</td>
<td>Family history of pre-eclampsia</td>
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<tr>
<td>Diagnosis of schizophrenia or bipolar</td>
<td>Assisted reproductive technology</td>
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<tr>
<td>Maternal anxiety or depression</td>
<td>Congenital heart defects</td>
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Risk reduction

• Assess all women for risk factors

• If moderate to high risk, recommend
  ◦ Aspirin 100-150 mg daily (preferably at night) commencing before 16 weeks and continuing until birth, or cease at 37+0 weeks

• Advise women to seek advice immediately if they have signs and symptoms of pre-eclampsia
Initial investigations

- Accurate BP measurement
- Screen for proteinuria each visit (dipstick)
  - Quantify if > 2+ or repeated 1+ proteinuria
- Blood tests:
  - Full blood count, liver function tests including lactate dehydrogenase, and urate
- Cardiotococograph and ultrasound scan
Mild to moderate hypertension

• Consider drug therapy if:
  ◦ sBP is persistently greater than 140 mmHg and/or
  ◦ dBP is persistently greater than 90 mmHg
  ◦ There are associated signs and symptoms of pre-eclampsia

• Suggested target BP:
  ◦ sBP 110-140 mmHg and dBP < 85 mmHg
Oral antihypertensive medications

• ACE inhibitors and angiotensin receptor blockers are contraindicated in pregnancy

• Consider the following medications:
  ◦ Methyldopa
  ◦ Labetalol
  ◦ Hydralazine
  ◦ Nifedipine
  ◦ Prazosin
  ◦ Clonidine
Severe hypertension

• Commence drug therapy if severe hypertension (sBP $\geq 160$ or dBP $\geq 100$ mmHg)

• Target BP—aim for gradual lowering
  ◦ sBP 130─150 mmHg / dBP 80─90 mmHg

• sBP $\geq 170$ with or without dBP $\geq 110$ mmHg is a medical emergency
Pre-eclampsia

- Severity, timing, progression and onset are unpredictable: close surveillance required
- Birth is the definitive management
- Increased severity indicated by difficulty controlling BP, HELLP syndrome, impending eclampsia, worsening fetal growth and wellbeing
- Independent risk factor for VTE
Magnesium sulfate

• Drug of choice for prevention and treatment of eclampsia
• Indications to commence:
  ◦ Eclampsia
  ◦ Severe pre-eclampsia
  ◦ Pre-eclampsia with ≥ one sign of central nervous system irritability
  ◦ Transfer to higher service level required
HELLOP syndrome
Haemolysis Elevated Liver enzymes Low Platelets

• Variant of severe pre-eclampsia
• Includes:
  ◦ Thrombocytopenia (common)
  ◦ Haemolysis (rare)
  ◦ Elevated liver enzymes (common)
• Magnesium sulfate may be indicated
• Consider platelet transfusion
• Plan birth if > 34+0 weeks gestation
Imminent eclampsia

• ≥ 2 of following symptoms
  ◦ Frontal headache
  ◦ Visual disturbance
  ◦ Altered level of consciousness
  ◦ Hyperreflexia
  ◦ Epigastric tenderness
  ◦ Oliguria

Queensland Clinical Guidelines: Hypertension and pregnancy
Eclampsia

• Resuscitation DRSABCD
• Goals of treatment
  ◦ Terminate the seizure
  ◦ Prevent recurrence
  ◦ Control hypertension
  ◦ Prevent maternal and fetal hypoxia
• Magnesium sulfate is the anticonvulsant drug of choice
• Plan birth (if antepartum) asap
Ongoing surveillance

- Plan care and document in health record
- Serial surveillance of maternal and fetal wellbeing
- Frequency, intensity and modality depends on individual clinical circumstances
Birth

- Multidisciplinary team approach
- Stabilise the woman prior to birth:
  - Control or prophylaxis against eclampsia
  - Control severe hypertension
  - Correct coagulopathy
  - Attention to fluid status
Timing and mode of birth

• Recommend vaginal birth unless CS indicated for other obstetric indications

• Moderate hypertension:
  ◦ If otherwise well–expectant management beyond 37 weeks

• Pre-eclampsia:
  ◦ Dependent on severity and gestation

• HELLP:
  ◦ Plan birth as soon as feasible
Intrapartum monitoring

• Close clinical surveillance required
• Minimum half hourly BP
• Continuous CTG
• IV access
• Multidisciplinary involvement
Intrapartum care

• 2nd stage:
  ◦ If BP is within target range: usual care
  ◦ If BP not responsive to initial drug therapy: advise assisted/operative birth

• 3rd Stage
  ◦ Active management as increased risk of PPH
    ◦ Consider syntocinon
    ◦ Consider carbetocin
  ◦ DO NOT give ergometrine or syntometrine
Postpartum

• Hypertension and pre-eclampsia may develop for the first time postpartum
• Continue close monitoring (4 hourly or more frequently)
• Ask frequently about the presence of headaches, epigastric pain
• Actively consider VTE prophylaxis
Postpartum drug therapy

- Continue antenatal antihypertensives
- Cease or reduce antihypertensive therapy when hypertensive symptoms are resolving
- If BP persistently elevated, start antihypertensives
- NSAIDs not recommended in women with severe renal impairment
- Methyldopa associated with depression
Discharge

- First and second line drugs are compatible with breastfeeding
- If taking ACE inhibitors, discuss contraception
- Recommend follow-up screening 7 to 10 days after discharge to ensure resolution/ascertain need for ongoing care
Discharge advice

- Advise to avoid smoking, maintain healthy weight, and of the benefits of exercise
- Encourage overweight women to attain healthy body mass index
- Discuss assessment for traditional cardiovascular risk markers (e.g. annual BP, serum lipids, blood glucose)
- Risk reduction for future pregnancy (e.g. aspirin, change from ACE inhibitors)