HYPERTENSION IN PREGNANCY

Hypertensive disorders during pregnancy occur in women with pre-existing primary or secondary chronic hypertension, and in women who develop new-onset hypertension in the second half of pregnancy (gestational hypertension).

If occurring with significant proteinuria it is termed pre-eclampsia – see Eclampsia and Severe pre-eclampsia guidelines

DEFINITION

Chronic hypertension
- Hypertension present at booking visit or <20 weeks’ gestation or if woman already taking antihypertensive medication when referred to maternity services. Can be primary or secondary in aetiology

Gestational hypertension (GHT)
- New hypertension presenting after 20 weeks’ gestation without significant proteinuria

GHT with significant proteinuria
- New hypertension presenting after 20 weeks’ gestation with urinary protein: creatinine ratio >30 mg/mmol or a validated 24 hr urine collection result shows >300 mg protein

Degrees of hypertension

<table>
<thead>
<tr>
<th></th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
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<tbody>
<tr>
<td>Systolic BP</td>
<td>140–149 mmHg</td>
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<td>&gt;160 mmHg</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>90–99 mmHg</td>
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<td>&gt;110 mmHg</td>
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</table>

RISKS

Woman
- Increase in the lifetime risk of chronic hypertension and cardiovascular disease

Baby
- Higher rates of perinatal mortality, preterm and low birth weight

SYMPTOMS AND SIGNS

- Advise woman to report any of the following to a healthcare professional:
  - headache
  - visual disturbance (blurring or flashing)
  - pain below ribs
  - sudden swelling of face, hands or feet
  - vomiting

INVESTIGATIONS

- BP and urinalysis on each visit to a healthcare professional

TREATMENT

Antihypertensive treatment and prenatal counselling

- Base antihypertensive treatment on pre-existing treatment, medication side-effect profile and risk of teratogenicity
- Stop angiotensin-converting enzyme inhibitors (ACEI) and/or angiotensin II receptor blockers (ARBs) within 2 days of notification of pregnancy and offer alternative medication
- ACEI and ARB carry an increased risk of congenital abnormalities
- There may be an increased risk of congenital abnormalities and neonatal complications in women taking chlorothiazide diuretics during pregnancy
- Limited evidence shows no increased risk of congenital abnormalities with other antihypertensive treatments, but discuss with healthcare professional responsible for managing the hypertension
- The antihypertensive medications used in pregnancy are methyldopa, labetalol and nifedipine
Postnatal care

Antihypertensive treatment
- Continue antenatal antihypertensive treatment
- If methyldopa was used during pregnancy, stop within 2 days of birth
- If no antenatal antihypertensive treatment was required, commence antihypertensive treatment only if BP ≥150/100 mmHg
- Measure BP:
  - daily for first 2 days after birth
  - at least once 3–5 days after birth
  - as clinically indicated if antihypertensive treatment changed
- Maintain BP at 140/90 mmHg
- See Breastfeeding advice for women taking antihypertensive medication section below

Follow-up care
- At transfer to community care, ensure care plan in place, including:
  - who will provide follow-up care (including medical review if required)
  - frequency of blood pressure monitoring
  - thresholds for reducing or stopping treatment
  - indications for referral to primary care for blood pressure review
- If antihypertensive treatment is to be continued, offer medical review 2 weeks after transfer to community care
- Offer a medical review at 6–8 week postnatal review with GP
- If antihypertensive treatment is to be continued after the 6–8 week postnatal review, offer a specialist assessment of hypertension

Breastfeeding advice for women taking antihypertensive medication
- If breastfeeding or expressing milk, avoid diuretic treatment
- Inform woman the following antihypertensive drugs have no known adverse effects on babies receiving breast milk:
  - labetalol
  - nifedipine
  - enalapril
  - captopril
  - atenolol
  - metoprolol
- Inform woman that there is insufficient evidence regarding the safety of babies receiving breast milk where mother is receiving:
  - angiotensin II receptor blockers (ARBs)
  - amlodipine
  - angiotensin-converting enzyme (ACE) inhibitors other than enalapril and captopril
- Assess the clinical wellbeing of baby, especially adequacy of feeding, at least daily for first 2 days after delivery

CHRONIC HYPERTENSION

Antihypertensive treatment
- See Antihypertensive treatment and prenatal counselling above
- In uncomplicated chronic hypertension, maintain blood pressure at <150/100 mmHg
- In target-organ damage secondary to chronic hypertension (e.g., kidney disease), maintain BP at <140/90 mmHg
- Refer pregnant women with secondary chronic hypertension to a specialist in hypertensive disorders

Aspirin therapy
- 75 mg daily from 12 weeks until delivery

Antenatal care
- Plan additional antenatal consultations according to individual needs of woman and baby

Fetal monitoring
- At 28–30 and 32–34 weeks perform:
  - ultrasound for fetal growth and amniotic fluid volume assessment
  - umbilical artery Doppler velocimetry
Hypertension 2013–15

- If results normal, do not repeat after 34 weeks unless clinically indicated
- If fetal activity abnormal, perform electronic fetal monitoring – see Electronic fetal monitoring (EFM) guideline

Timing of birth
- Chronic hypertension with blood pressure <160/110 mmHg, with or without antihypertensive treatment:
  - do not offer delivery before 37 weeks
- Chronic hypertension with blood pressure <160/110 mmHg after 37 weeks, with or without antihypertensive treatment:
  - after 37 weeks, woman and obstetrician will agree timing of birth
- Severe, uncontrolled chronic hypertension:
  - offer delivery after a course of corticosteroids completed (if required)

Intrapartum care

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Postnatal care
See postnatal care above

GESTATIONAL HYPERTENSION WITHOUT PROTEINURIA

Prevention of GHT

Aspirin therapy
- Women with one or more high risk factor or two or more moderate risk factors of pre-eclampsia, start 75 mg aspirin daily from 12 weeks until delivery
- High risk factors:
  - hypertensive disease during a previous pregnancy
  - chronic kidney disease
  - autoimmune disease e.g. systemic lupus erythematosus or antiphospholipid syndrome
  - type 1 or type 2 diabetes
  - chronic hypertension
- Moderate risk factors:
  - first pregnancy
  - age ≥40 yr
  - pregnancy interval of >10 yr
  - body mass index (BMI) ≥35 kg/m² at first visit
  - family history of pre-eclampsia
  - multiple pregnancy

Antenatal care
- Full assessment in secondary care setting by a healthcare professional trained in the management of hypertensive disorders

Assessment and antihypertensive treatment (see Antihypertensive treatment and prenatal counselling above)

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<td>Treat with first-line oral labetalol to maintain BP at &lt;150/80–100 mmHg (monitor via community midwife or MAU)</td>
<td>Keep mobile in hospital</td>
</tr>
<tr>
<td>Measure BP weekly</td>
<td>Measure BP at least twice a week</td>
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<tr>
<td>Test for proteinuria at each visit using an automated reagent-strip reading device or urinary protein:creatinine ratio</td>
<td>Test for proteinuria at each</td>
<td>Measure BP at least 4 times daily</td>
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  - type 1 or type 2 diabetes
  - chronic hypertension
- Moderate risk factors:
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  - pregnancy interval of >10 yr
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  - multiple pregnancy

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blood tests
- If presenting at <32 weeks or at high risk of pre-eclampsia, test for proteinuria and measure BP twice a week
- Test renal function, electrolytes, FBC, transaminases, bilirubin
- If no subsequent proteinuria, no further blood tests required

Fetal monitoring

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<tbody>
<tr>
<td>- If diagnosis confirmed before 34 weeks perform:</td>
<td>- At diagnosis, if conservative management planned, perform:</td>
</tr>
<tr>
<td>- ultrasound for fetal growth and amniotic fluid volume assessment</td>
<td>- ultrasound for fetal growth, amniotic fluid volume assessment and umbilical artery Doppler velocimetry (not &gt;2-wkly)</td>
</tr>
<tr>
<td>- umbilical artery Doppler velocimetry</td>
<td>- EFM</td>
</tr>
<tr>
<td>- If results normal, do not repeat after 34 weeks</td>
<td>- Do not repeat more than weekly if all fetal monitoring normal</td>
</tr>
<tr>
<td>- If fetal activity abnormal:</td>
<td>- Repeat EFM if any of the following:</td>
</tr>
<tr>
<td>- EFM</td>
<td>- change in fetal movement reported by woman</td>
</tr>
<tr>
<td></td>
<td>- vaginal bleeding</td>
</tr>
<tr>
<td></td>
<td>- abdominal pain</td>
</tr>
<tr>
<td></td>
<td>- deterioration in maternal condition</td>
</tr>
<tr>
<td></td>
<td>- If results of any fetal monitoring abnormal, inform consultant obstetrician</td>
</tr>
</tbody>
</table>

- Document care plan in maternal healthcare record to include the following:
  - timing and nature of future fetal monitoring
  - fetal indications for birth
  - if and when corticosteroids necessary
  - when discussion with neonatologist and obstetric anaesthetist should take place and what decisions are required

Timing of birth
- **GHT with blood pressure <160/110 mmHg**, with or without antihypertensive treatment
  - do not offer delivery before 37 weeks
- **GHT with blood pressure <160/110 mmHg after 37 weeks**, with or without antihypertensive treatment
  - woman and senior obstetrician agree timing of birth, and maternal and fetal indications for birth
- **Refractory severe gestational hypertension**
  - offer delivery after a course of corticosteroids (if required) has been completed

Intrapartum care for woman with GHT

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<tr>
<td>- See <strong>Epidural anaesthesia</strong> guideline – Investigations</td>
<td>- If BP controlled &lt;150 mmHg systolic, do not routinely limit duration of second stage of labour</td>
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<td>- If BP does not respond to initial treatment, advise operative birth</td>
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Postnatal care
- See Postnatal care above

Recurrence risk and long-term health risks
- Women who experienced gestational hypertension risk developing:
  - gestational hypertension in future pregnancy ranges from about 1 in 6 (16%) pregnancies to about 1 in 2 (47%) pregnancies
  - pre-eclampsia in future pregnancy ranges from 1 in 50 (2%) to about 1 in 14 (7%) pregnancies

Long-term health risks of cardiovascular disease
- Women who have experienced gestational hypertension or pre-eclampsia have an increased risk of developing hypertension and its complications in later life

Long-term risk of end-stage kidney disease
- Inform women with a history of hypertension without proteinuria and no hypertension at the postnatal review (6–8 weeks after delivery) that although the relative risk of end-stage kidney disease is increased, the absolute risk is low and no further follow-up is necessary

GESTATIONAL HYPERTENSION WITH PROTEINURIA (PRE-ECLAMPSIA)

Introduction
- Risk of maternal and perinatal mortality and morbidity is increased once a diagnosis of pre-eclampsia is made (see Severe pre-eclampsia guideline)
- Clinical management is often determined by drawing a balance between maternal and fetal considerations. For example, the timing of birth depends on mother's condition and risk of intrauterine death of baby or, if born, neonatal death or morbidity as a result of prematurity

Antenatal care (see Antihypertensive treatment and prenatal counselling above)

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</tr>
<tr>
<td>Measure BP at least 4 times a day</td>
<td>Measure BP at least 4 times a day</td>
<td>Measure BP more than 4 times a day depending on clinical circumstances</td>
</tr>
<tr>
<td>Test kidney function, electrolytes, FBC, LFT twice a week</td>
<td>Test kidney function, electrolytes, FBC, LFT 3 times a week</td>
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</tbody>
</table>

Timing of birth

Before 34 weeks
- Manage conservatively until 34 weeks
- Consultant obstetrician to document maternal biochemical, haematological and clinical and fetal indications for elective birth before 34 weeks and write plan for antenatal fetal monitoring
- Offer birth (after discussion with neonatal and anaesthetic teams and, if required, course of corticosteroids completed) if:
  - severe refractory hypertension
  - maternal or fetal clinical condition deteriorates

34–36+6 weeks
- If required course of corticosteroids completed, recommend birth after 34 weeks if pre-eclampsia with severe hypertension
- If pre-eclampsia with mild or moderate hypertension, offer birth at 34–36+6 weeks depending on maternal and fetal condition, risk factors and availability of neonatal intensive care

After 37+0 weeks
- Recommend birth within 24–48 hr
Fetal monitoring
- Ultrasound for fetal growth and amniotic fluid volume. Umbilical artery Doppler velocimetry at diagnosis if conservative management planned
- Do not repeat more than every 2 weeks
- EFM at diagnosis. Repeat if change in fetal movement reported by woman, vaginal bleeding, abdominal pain, deterioration in maternal condition

Intrapartum care
- Mild and moderate hypertension (140/90–159/109 mmHg)
- Measure BP hourly
- Continue antenatal hypertensive treatment
- Carry out haematological and biochemical monitoring according to criteria from antenatal period
- If BP stable, do not routinely limit duration of second stage of labour

Postnatal care
See Postnatal care above

Haematological and biochemical monitoring
- In women who have pre-eclampsia with mild or moderate hypertension or after step-down from critical care:
  - Measure platelet count, LFT and serum creatinine 48–72 hr after birth or step-down
  - If results are normal at 48–72 hr, do not repeat platelet count, transaminases or serum creatinine measurement
  - If biochemical and haematological indices are improving but stay within the abnormal range in women with pre-eclampsia who have given birth, repeat platelet count, LFT and serum creatinine measurement as clinically indicated and at postnatal review (6–8 weeks after birth)
  - If biochemical and haematological indices are not improving relative to pregnancy ranges in women with pre-eclampsia who have given birth, repeat platelet count, LFT and serum creatinine measurement as clinically indicated
  - In women with pre-eclampsia who have given birth, carry out a urinary reagent-strip test at the postnatal review (6–8 weeks after birth)
  - In women who had pre-eclampsia and still have proteinuria (1+ or more) at postnatal review (6–8 weeks after birth) offer a further review at 3 months after birth to assess kidney function and consider referral for specialist renal assessment