HealthPathways

Hypertension in Pregnancy and Postpartum

Red Flags

- New onset hypertension after 20 weeks gestation, including the early postpartum period
- Severe hypertension (more than 150 systolic blood pressure (BP) or more than 100 diastolic)
- Symptoms of pre-eclampsia

Background

About hypertension in pregnancy

About hypertension in pregnancy

Defined as 140 mmHg or more systolic pressure, or 90 mmHg or more diastolic pressure, confirmed on at least 2 measurements.

Classifications:

- Chronic hypertension is hypertension that precedes, or is present before, the twentieth week of pregnancy.

Chronic hypertension in pregnancy

- Patients have a higher risk (40%) of pre-eclampsia, increased risk of preterm birth, fetal growth restriction, and placental abruption.
- Treatment decreases maternal mortality rates from severe hypertension such as stroke, and heart and renal failure.

- Gestational hypertension:
  - is new onset hypertension after 20 weeks gestation, with no maternal or fetal features of pre-eclampsia.
  - Up to 25% of patients may go on to develop pre-eclampsia, and will need close monitoring.
  - If near term, gestational hypertension poses small increased risk of adverse pregnancy outcomes.
  - The earlier the gestation at presentation, and the more severe the hypertension, the higher the likelihood that the patient will progress to develop pre-eclampsia or an adverse pregnancy outcome.
- Pre-eclampsia:
  - is pregnancy-induced hypertension with involvement of 1 or more organ systems.

Pre-eclampsia involvement of organ systems

- Renal – Proteinuria (protein to creatinine ratio more than 30 mmol) is the most commonly recognised additional feature, but a clinical diagnosis is not mandatory . More than 90 umol/L serum creatinine, or less than 80mL oliguria every 4 hours, are other possible additional features.
- Haematological – Thrombocytopenia, haemolysis, and disseminate intravascular coagulation (DIC).
- Liver – Severe epigastric or right upper quadrant pain. Raised serum transaminases.
- Neurological – Convulsions (eclampsia), hyperreflexia with clonus, severe headache, persistent visual disturbances, and stroke.
- Others – e.g. pulmonary oedema, fetal growth restriction, and placental abruption.

- Oedema is not included in the diagnostic features of pre-eclampsia:
  - Oedema is a common feature of normal pregnancy.
  - Severe pre-eclampsia may be present without oedema.
  - If rapid development of generalised oedema screen for pre-eclampsia.

Assessment

First Appointment

1. History:
   - history and past management of known hypertension, and family history of hypertension
   - comorbidities, e.g. diabetes or renal disease
   - risk factors for developing pre-eclampsia

Risk factors

- Raised blood pressure 140/90 mmHg or more pre-conception, or at initial booking.
- Diabetes
- High BMI – especially if more than 30.
- Smoking.
- History of pre-eclampsia – personal or family.
- History of essential hypertension or renal disease.
- Previous pregnancy complicated by hypertension.
- Autoimmune disease, e.g. systemic lupus erythematosus (SLE) or antiphospholipid syndrome.
- Maternal age older than 40 years.
- Pregnancy – first, multiple, or interval more than 10 years.

   - symptoms of pre-eclampsia.

Symptoms of pre-eclampsia

- Headache
- Visual disturbance
- Swelling
- Epigastric pain or tenderness
- Nausea or vomiting
- Chest pain

- Shortness of breath
- Seizures
- General malaise
- Decreased fetal movements

- Consider any secondary causes of hypertension. If secondary cause suspected, seek obstetric physician advice.

Rarer secondary causes:

- renal causes e.g., renal disease, renal artery stenosis
- coarctation of the aorta
- endocrine causes e.g., hyperaldosteronism, Cushing's syndrome, phaeochromocytoma

Consider the following tests to look for secondary causes (e.g., if patient <40 years, or has resistant hypertension or clinical features that suggest a secondary cause):

Suspected secondary cause	Indications	Investigations
Phaeochromocytoma	episodic palpitations / flushes with labile blood pressure	24 hour urine for catecholamines and metanephrines (before treatment, as treatment may modify results)
Renal disease	family history of kidney disease, palpable kidneys, renal bruit, suspected urinary obstruction	Renal ultrasound
Hyperaldosteronism	hypokalaemia despite ACEi	Ambulatory morning plasma aldosterone and renin activity
Cushing's Syndrome		24 hour urinary cortisol, **or** 1 mg overnight dexamethasone suppression test or a series of midnight salivary cortisol samples

2. Examination:
   - If no previous diagnosis or investigation for hypertension, perform full cardiovascular examination, including for oedema, as with any newly diagnosed hypertension.
   - Check blood pressure (BP) using a manual sphygmomanometer with an appropriate sized cuff at heart level, with patient sitting with feet flat on the floor.
3. Investigations – arrange complete blood count, renal function tests, liver function tests, and midstream urine (MSU) for protein to creatinine ratio.

At each antenatal visit

1. Ask about symptoms of pre-eclampsia.
2. Check BP.
3. Screen with MSU for proteinuria.
4. Check fetal movements and growth.

Management

Practice point

In pre-eclampsia, the BP may only be slightly elevated, but abnormal investigations or

symptoms will be present.

Pre-conception

If the patient is being treated for uncomplicated mild essential hypertension:

- Ensure this treatment is an antihypertensive considered safe in pregnancy. If not, switch to safe treatment options, e.g. NZF methyldopa, NZF labetalol.
    - Continue Angiotensin converting enzyme inhibitors (ACEI) and angiotensin-II receptor antagonists (ARAs) until pregnancy is diagnosed, and then discontinue once pregnancy is confirmed.
    - Immediate replacement of the ACEI may not be necessary, as blood pressure tends to drop in early pregnancy.
- Aim for BMI in the normal range to improve pregnancy outcomes.
- Counsel patient of about 40% risk of pre-eclampsia with pre-existing hypertension.

Pregnancy

Chronic hypertension

1. Request obstetric assessment – ensure all involved in the patient's care are informed.
2. Monitor closely for pre-eclampsia.
3. If blood pressure (BP) is less than 120/80 in early pregnancy, reduce antihypertensive medication. Blood pressure normally falls in early pregnancy and it is often possible to discontinue antihypertensive treatment.
4. Stop use of angiotensin converting enzyme inhibitors (ACEI) or angiotensin-II receptor antagonists (ARAs) when pregnancy is diagnosed. Immediate replacement of ACEI inhibitor with another agent may not be necessary.
5. If treatment is required use safe treatment options to achieve target levels.

Target levels

Target blood pressure goal:

- without end-organ damage – aim between 140 to 150 systolic and 90 to 100 diastolic. Overly aggressive blood pressure lowering is associated with reduced birth weight.
- with comorbidities or end-organ damage – target is lower, e.g. 120 to 140 systolic and 80 to 90 diastolic.

Treatment options during pregnancy

- Methyldopa

First line therapy – methyldopa

NZ Formulary – NZF methyldopa

- A typical starting dose is 250 mg three times daily. Can increase up to 500 mg four times daily.
- Common side effects are sedation and nasal stuffiness.
- Methyldopa can affect mood, and may best be avoided where there is a history of depression.
- After delivery, consider using an alternative antihypertensive if required.
- Monitor LFTs monthly.

- Labetalol

Second line therapy – labetalol

NZ Formulary – labetalol

- Exclude asthma.
- Oral 100 mg immediate dose, then regular dose of 100 mg three times daily.
- Can increase up to 200 mg four times daily.

- Nifedipine

Third line therapy – nifedipine

NZ Formulary – nifedipine

- Third line therapy as it can cause a reflex tachycardia if started on its own.
- Oral 10 mg slow release twice daily.
- Can increase up to 30 mg slow release twice daily.

6. Arrange follow-up for review in 3 to 7 days:
   - When BP at target levels, the Lead Maternity Carer (LMC) midwife will monitor BP and for pre-eclampsia.
   - If BP outside target levels, adjust medication as required, and follow patient weekly until obstetric review.

Antenatal clinic

Referrals are triaged on the information provided, and will normally be seen within 2 weeks.

   - Ensure good communication between all involved in the woman's care.
7. If less than 16 weeks gestation, start prophylaxis for pre-eclampsia (aspirin 100 mg once daily at night and calcium carbonate 1.25 g once daily) as risk of developing pre-eclampsia is around 40%.
8. At each antenatal visit, check BP, MSU, and assess fetal growth. If proteinuria or BP is 150/100 or more, manage as pre-eclampsia (see below) and request acute obstetric assessment.

Gestational hypertension

1. A sudden increase in blood pressure in patients more than 20 weeks pregnant can indicate pre-eclampsia.
2. If pre-eclampsia suspected, arrange urgent blood and urine tests, and discuss with the acute obstetric registrar.

Urine test for pre-eclampsia

- Check midstream urine (MSU) – dipstick for proteinuria and send urine for culture to check for urinary tract infection (UTI).
- If protein on dipstick 1+ or more, request protein to creatinine ratio on the MSU.
- A protein to creatinine ratio over 30 mmol is consistent with pre-eclampsia.

Pre-eclampsia blood tests

- CBC
- Urea

- Creatinine
- Urate
- LFTs – alanine aminotransferase (ALT) or aspartate aminotransferase (AST) above 70 IU/L are considered significant.

3. Once pre-eclampsia is excluded:
    - If BP between 140 to 149 systolic or 90 to 99 diastolic, request obstetric assessment, as initiation of treatment needs to be decided on an individual basis.
    - If less than 16 weeks gestation, start prophylaxis for pre-eclampsia (aspirin 100 mg once daily at night, and calcium carbonate 1.25 g once daily).
4. Monitor closely and at each antenatal visit, check BP, MSU and assess fetal growth. If proteinuria or BP is 150/100 or more, manage as pre-eclampsia.

Pre-eclampsia

In pre-eclampsia, blood pressure may be only slightly elevated, but abnormal investigations or symptoms will be present.

1. If symptoms of pre-eclampsia, or 150 mmHg or more systolic pressures or 100 mmHg or more diastolic pressures, request acute obstetric assessment.
2. If no symptoms and BP less than 150/100 but there is a suspicion of pre-eclampsia, arrange immediate pre-eclampsia blood and urine tests.
3. If MSU sample protein to creatinine ratio more than 30 mmol, or any significant abnormalities in the bloods, request acute obstetric assessment.

Post-partum

1. Post-partum management of essential hypertension.

Post-partum management of essential hypertension

These medications are considered safe in the postpartum period and are compatible with breast feeding:

- Labetalol

    For full prescribing details, see the NZ Formulary – labetalol

    My Medicines – labetalol

- Nifedipine

    For full prescribing details, see the NZ Formulary – nifedipine

    My Medicines – nifedipine

- Enalapril

    For full prescribing details, see the NZ Formulary – enalapril

    My Medicines – enalapril

Continue anti-hypertensive treatment as dictated by the blood pressure. If reducing medication, do so

gradually.

Discuss lifestyle factors to reduce blood pressure.

Consider investigations to assess long-term cardiovascular risk.

2. Post-partum management of women who have had pre-eclampsia.

Post-partum women who have had pre-eclampsia

- Pre-eclampsia is usually diagnosed antenatally, but can occur in the early post-partum period.
  - About 44% of eclamptic seizures occur in the post-partum period with eclampsia reported up to 4 weeks post-partum.
  - About 13% of patients will have underlying chronic or essential hypertension not suspected antenatally.
- Once the patient is stable in regards to pre-eclampsia, she will be monitored by her Lead Maternity Carer (LMC) midwife.
- A small number of women with severe pre-eclampsia will be discharged from hospital with a clear management plan written by the obstetric physicians with information on monitoring blood pressure and tapering medication over the next few weeks to months.

Management plan

- The patient and LMC midwife will verbally agree to the proposed management plan, which is then communicated to the general practitioner (usually through the discharge summary).
- If the medical team anticipates monitoring or adjusting medication they will contact the general practitioner.
- Monitoring frequency will be advised on the management plan. It may be necessary for up to 3 months post-partum, although most women will have stopped treatment before then.
- General practitioners to seek obstetric physician advice if required.
- BP or monitoring targets

Blood pressure/monitoring targets

- Aim for BP not exceeding 160/100, and close to normal non-pregnant range.
- Medications considered safe in the postpartum period and compatible with breast feeding:
  - NZF Labetalol
  - NZF Nifedipine
  - NZF Enalapril
- Continue anti-hypertensive treatment as dictated by the blood pressure. If reducing medication, do so gradually.
- Consider renal disease and arrange further investigation if hypertension and proteinuria at 6 weeks postpartum.
- Arrange a cardiovascular risk assessment at 3 to 6 months postpartum. Patients with pre-eclampsia risk cardiovascular disease in later life.

- Subsequent pregnancy

Subsequent pregnancy

- Request early non-acute obstetric assessment if previous pre-eclampsia with significant intrauterine growth restriction (IUGR) or requiring delivery at less than 34 weeks, or with multi-organ involvement.

- Commence aspirin 100 mg once daily at night (ideally started before 12 weeks gestation), and calcium carbonate 1.25 g daily, if there are major risk factors for pre-eclampsia

Major risk factors

Major risk factors for pre-eclampsia include:

- previous pre-eclampsia requiring delivery before 37 weeks, or
- previous pre-eclampsia with haemolysis, elevated liver enzymes, and or low platelets (HELLP) syndrome.
- predisposing medical conditions:
  - autoimmune, e.g. systemic lupus erythematosus, scleroderma, and anti-phospholipid syndrome.
  - chronic hypertension.
  - diabetes type 1 and 2.
  - any chronic kidney disease.

- Seek obstetric advice if unsure.

3. Monitoring and claiming:
   - First week post-partum

Monitoring and claiming – First week postpartum

- The specialist may request that the LMC midwife monitors the woman's blood pressure at home. In most cases this can be incorporated into the LMC midwife's standard post natal visits.
- If there are any changes or concerns not covered by the management plan, the LMC midwife will seek advice from the general practitioner. If the general practitioner is involved, the LMC midwife is required to submit a referral form to MMPO for Improving the Continuity of Care for Pregnant Women to enable the woman to have funded consultations with her general practitioner. Consultations for medication and monitoring advice via phone or face to face.

   - Second to sixth week post-partum

Monitoring and claiming – Second to sixth week post-partum

- If patient requires regular, continuous monitoring and there are physical or financial barriers to visiting her general practice, the Lead Maternity Carer (LMC) midwife may choose to monitor BP at patient's home. The LMC midwife needs to inform the general practitioner that they are taking responsibility for this and communicating the results.
- The LMC midwife may claim for visits exceeding 14 via Improving the Continuity of Care for Pregnant Women.
- If the LMC midwife chooses not to continue monitoring at home, they will inform the general practitioner that they are handing over this responsibility.
- The LMC midwife will complete an Improving the Continuity of Care for Pregnant Women if not already done, to fund patient's consultations with her general practitioner.

   - After six weeks

Monitoring and claiming – After six weeks

If patient still requires BP monitoring and there are financial barriers to attending her general practice, the Lead Maternity Carer (LMC) midwife can refer via Improving the Continuity of Care for Pregnant Women to fund general practice consultations up to 3 months post partum.

Referral

- Request acute obstetric assessment if:
  - any symptoms of pre-eclampsia, particularly epigastric pain, nausea, vomiting, headache, or visual disturbance.
  - proteinuria is confirmed (MSU protein to creatinine ratio more than 30 mmol).
  - significant abnormalities in blood tests.
  - hypertension is severe 150 mmHg systolic or more or 100 mmHg diastolic or more.
- Refer all other patients presenting with pre-existing hypertension for obstetric assessment after initial management as dictated by their blood pressure. Referrals to the Antenatal clinic are triaged on the information provided, and will normally be seen within 2 weeks.
- Request early non-acute obstetric assessment in a subsequent pregnancy if previous pre-eclampsia with significant intrauterine growth restriction (IUGR) or requiring delivery at less than 34 weeks, or with multi-organ involvement.

Information

Clinical Resources

Further information

- BMJ – Postpartum Management of Hypertension
- CDHB Health – Management of Pre-eclampsia (Appendix B contains information on the management of acute hypertension)
- NICE – Hypertension in Pregnancy: Diagnosis and Management [NG133]
- Society of Obstetric Medicine Australia and New Zealand (SOMANZ) – Guidelines for the Management of Hypertensive Disorders of Pregnancy

Patient Information

Nice.org.nz - High Blood Pressure in Pregnancy

New Zealand College of Midwives – Find Your Midwife

Sources

Select bibliography

Bellamy L, Casas JP, Hingorani AD, Williams DJ. Pre-eclampsia and risk of cardiovascular disease and cancer in later life: systematic review and meta-analysis.

BMJ. 2007;335:974.

Page Information | Other Regions

Information about this HealthPathways document (28855):

Document Owner:	Not assigned (see Who's Who)
Last Updated:	May 2018
Last Reviewed:	May 2018
Next Review:	January 2020
Keywords:	foetal, fetal,pre-eclampsia,preeclampsia

Have you read the disclaimer?