Hypertensive disorders in pregnancy: Approach to diagnosis and management in general practice

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Background
Hypertensive disorders in pregnancy (HDIP) are among the leading causes of maternal and perinatal morbidity and mortality and should not be reserved for specialist care and expertise.[1] General practitioners (GPs) are inevitably involved in the care of women with HDIP, particularly in the preconception, early pregnancy and postpartum periods and, also, as shared maternity care providers. It is, therefore, critical that GPs can assess and manage HDIP.

Objective
This article aims to provide GPs with a practical approach to the diagnosis and management of hypertensive disorders in pregnancy, including postpartum monitoring and ongoing cardiovascular risk surveillance.

Discussion
The spectrum of HDIP includes gestational hypertension, chronic hypertension, pre-eclampsia (PET)/eclampsia and PET superimposed on chronic (pre-existing) hypertension, and this can affect up to 8–10% of pregnant women.

THE RISKS associated with uncontrolled blood pressure in pregnancy are significant, which further underpins the importance of general practitioners (GPs) recognising this spectrum of disorders, including gestational hypertension, chronic hypertension, pre-eclampsia (PET)/eclampsia and PET superimposed on chronic (pre-existing) hypertension (Box 1).[1–4] Up to 8–10% of pregnant women are affected by hypertensive disorders in pregnancy (HDIP).[4] The maternal risks include cardiac and cerebrovascular complications, such as reduced cardiac output, pulmonary oedema, stroke, seizure and encephalopathy.[1,2,5] Foetal and uteroplacental risks include foetal growth restriction and placental abruption.[1,2,5]

Aim

This article outlines a practical approach to managing HDIP for GPs that involves identifying patients at risk, making a diagnosis and management, including postpartum monitoring and ongoing cardiovascular risk surveillance.

Identifying patients at higher risk of PET

The following risk factors should be assessed in each patient as a means of risk stratification (Table 1), where the presence of one or more major risk factors or two or more moderate risk factors confers a higher risk for developing PET.[2,6] Where accessible, combined first-trimester screening (sonographic and serum-based biomarkers) is an additional tool that can help maximise a patient's risk assessment for PET.[2] Those patients who are at higher risk of developing PET should be commenced on prophylactic treatment with low-dose aspirin (150 mg daily) and calcium (>1 g daily),[2] which have been demonstrated to be significant in reducing the risk of PET if commenced before 16 weeks' gestation (and as early as 12 weeks).[2,4,6,7]

Other considerations for reducing an individual's risk for PET are encouraging healthy lifestyle choices, exercise and weight management, and effectively managing pre-existing hypertension and other medical conditions.[6]

Diagnosis of hypertensive disorders in pregnancy

The diagnosis of HDIP is the measurement of elevated systolic blood pressure in a pregnant patient of ≥140 mmHg and/or a diastolic blood pressure of ≥90 mmHg, on two occasions, at least 15 minutes apart.[1,2] Part of the assessment involves reviewing the patient's symptoms and examining the patient for signs consistent with HDIP (Box 2).

Where an HDIP is diagnosed (or suspected), a workup should take place, including an assessment of proteinuria and PET bloods. Serial foetal growth ultrasound

Box 1. Spectrum of hypertensive disorders in pregnancy[1–4]

Gestational hypertension is defined as a new onset of hypertension (systolic ≥140 or diastolic ≥90 mmHg) after 20 weeks' gestation, with nil associated proteinuria or manifestations of PET, and resolves by 12 weeks postpartum.

Chronic (pre-existing) hypertension is defined as high blood pressure that is diagnosed any time before 20 weeks' gestation or that does not resolve by 12 weeks postpartum.

Pre-eclampsia/Eclampsia is defined as the development of high blood pressure after 20 weeks' gestation, plus evidence of other end-organ dysfunction, including renal (proteinuria, oliguria, raised creatinine), haematological (thrombocytopenia, haemolysis, DIC), hepatic (raised transaminases, epigastric/right upper quadrant abdominal pain), neurological (headaches, visual disturbances, hyperreflexia and clonus, generalised seizures of eclampsia, stroke) and foetal (intrauterine growth restriction) manifestations.

HELLP syndrome is defined as haemolysis, elevated liver enzymes and low platelets and occurs in 20% of severe PET cases.

PET superimposed on chronic (pre-existing) hypertension

DIC, disseminated intravascular coagulation; PET, pre-eclampsia.

Table 1. Risk factors for PET[1,2,6]

High risk factors	Moderate risk factors
• Chronic hypertension	• Family history of PET
• Previous hypertensive disorder in pregnancy	• BMI ≥35 kg/m^2
• Chronic kidney disease	• Age ≥40 years
• Diabetes mellitus	• Nulliparity
• Autoimmune disease (eg lupus or antiphospholipid syndrome)	• Interpregnancy gap of >10 years
• Multiple gestation	• Reproductive technology assisted pregnancy
	• Blood pressure systolic reading ≥130 mmHg and/or diastolic ≥80 mmHg

BMI, body mass index; PET, pre-eclampsia.

scans are also indicated given the risk for foetal growth restriction in HDIP.[6] This workup (Box 3) forms the basis of HDIP monitoring antenatally.

From a GP's perspective, once a persistently elevated blood pressure has been recorded in a consult, the patient should be referred urgently to a tertiary healthcare centre or obstetric unit for a full assessment and initiation of investigations by a health professional trained in managing HDIP.[6] It is in this setting that the timing of antenatal visits, HDIP assessments, foetal growth and wellbeing surveillance, delivery timing and use of corticosteroids for foetal lung maturation can be decided on.[6] However, it should be appreciated that GPs in more rural settings might have to initiate some of these investigations themselves, with remote advice.

Management of hypertensive disorders in pregnancy

Management principles include managing other medical conditions and initiation of antihypertensive therapy to control blood pressure. Labetalol, methyldopa and nifedipine modified-release tablets have demonstrated safety and efficacy in managing HDIP (Table 2).[2,6–8] Prazosin, clonidine and hydralazine can also be used in HDIP but are second-line agents that should be deferred to specialist use.[2,6]

In chronic hypertension, patients taking angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARB) or thiazide diuretics should be counselled on the increased risk of congenital abnormalities if they are taken during pregnancy and switched to an alternative agent.[6]

Other management considerations are regular antenatal visits, HDIP assessments and foetal growth and wellbeing surveillance, overseen by a secondary-level health professional trained in managing HDIP.[6]

Indications for referral to a tertiary unit for consideration of admission are elevated blood pressure (ie ≥140/90 to ≤159/109 mmHg) and clinical concerns for maternal or foetal wellbeing, or severe blood pressure (ie ≥160/110 mmHg).[6]

HELLP syndrome

In 20% of severe cases of PET, HELLP syndrome or haemolysis, elevated liver enzymes and low platelets ensue as part of the manifestation of severe disease.[9,10] Complications secondary to the syndrome include placental abruption, placental failure, extreme prematurity and maternal cardiac and cerebrovascular complications, amounting to a 7–70% perinatal mortality rate and a 1–24% maternal mortality rate.[10] For this reason, clinicians involved in maternity care must be able to recognise this syndrome. In a rare subset of HELLP cases, haematological and biochemical derangement might even precede hypertension and proteinuria; therefore, hypertension and proteinuria are not essential for its diagnosis.[9,10] This is known as atypical HELLP syndrome.[9,10] If HELLP syndrome is suspected, patients need to be urgently referred to a tertiary obstetric unit for specialised review and management.

Timing of birth

The decision on the timing of birth should involve a discussion with a senior obstetrician and the patient. In HDIP patients without PET with blood pressures below 160/110 mmHg, delivery should not be offered before 37 weeks' gestation unless there is another medical indication for delivery.[2,6] In the setting of PET, thresholds for delivery before 37 weeks need to be determined by a senior obstetrician with the patient. These include refractory blood pressure on three or more agents, abnormal dopplers, abnormal cardiotocograph, placental abruption, persistent neurological symptoms (eg intractable headache, visual disturbances or eclampsia) or HELLP syndrome.[2,6] For patients with PET, birth is recommended at 37 weeks' gestation.[2,6]

Box 2. Symptoms and examination findings suggestive of a hypertensive disorder in pregnancy[1,2,6]

Symptoms:

- Headaches
- Nausea/vomiting
- Visual disturbance
- Swelling
- Epigastric/right upper quadrant abdominal pain

Signs:

- Elevated blood pressure (≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg)
- Clonus ≥3 beats
- Hyperreflexia
- Epigastric/right upper quadrant tenderness
- Oedema
- Visual disturbance (blurred vision, diplopia, scotoma)

Table 2. First-line antihypertensive medications used in hypertensive disorders in pregnancy[2,6–8]

Antihypertensive	Class/ Mechanism of action	Dose	Adverse effects
Labetalol	Beta blocker	100 mg bd–400 mg tds–qid	Bronchospasm, headache, bradycardia
Methyldopa	Central action	250 mg bd–750 mg tds–qid	Depression, dry mouth, sedation
Nifedipine modified release	Calcium channel blocker	20 mg od–60 mg bd	Headache (first dose effect), flushing, tachycardia, peripheral oedema

If preterm birth is expected in <34 weeks' gestation, corticosteroids are recommended for foetal lung maturation,[2,6] but this decision needs to be made by a senior obstetrician in consultation with the patient.

Postpartum surveillance

On discharge from a maternity unit or care, it is important that the resolution of an HDIP is monitored and chronic hypertension continues to be managed effectively. Therefore, a postpartum plan should be communicated with the GP that clearly dictates the frequency of blood pressure reviews required.

Blood pressure peaks on days 3–6 postnatally in both normotensive and HDIP patients.[7] Review within this period is usually attended to by domiciliary midwives in Australia but might be required of a GP. Thereafter, a woman's GP will need to provide regular reviews to monitor their blood pressure based on their control, including titrating their antihypertensive therapy if they are still requiring it.

At six weeks, GPs perform a routine postpartum review, which should include measurement of blood pressure, and again a review of symptoms and signs suggestive of HDIP. It should be noted that hypertension including PET can be diagnosed in the postpartum period and certainly up to six weeks postpartum.[3]

Women taking methyldopa should be changed to an alternative agent secondary to the susceptibility to postnatal depression while on the agent.[2,6,7] Labetalol and nifedipine modified-release tablets continue to be safe to use in the postpartum period,[2,6,7] but it is good practice to change to enalapril (5 mg od–10 mg bd), which has also been shown to demonstrate safety and efficacy and might be preferred secondary to less dosing in comparison to labetalol and nifedipine.[2,6] These medications are all safe in breastfeeding.

It is important to recognise that where gestational hypertension and PET do not resolve by 12 weeks, this might herald essential hypertension, but secondary causes of hypertension need to be considered.[2]

Future hypertension and cardiovascular risk surveillance

There is an increased risk of hypertension and cardiovascular disease in women who have been diagnosed with an HDIP.[2,6] GPs should advise their patients to reduce this risk by encouraging healthy lifestyle choices, including smoking cessation, exercise and weight management, and effectively managing co-existing medical conditions.[6] It is reasonable to check blood pressure and perform a cardiovascular risk assessment annually in women who have had an HDIP and who do not have essential hypertension.

In subsequent pregnancies, the risk of HDIP is approximately 20%.[6] Therefore, it is important that GPs discuss the recommendation for prophylactic low-dose aspirin and calcium from as early as 12 weeks in subsequent pregnancies to reduce the risk of PET.[2,4,6,7]

Conclusion

Hypertensive disorders in pregnancy are not an entity reserved for specialist care. They are driven by specialist care, but GPs are inevitably involved, predominately in the preconception, early pregnancy and postpartum periods and as shared maternity care providers. This article has provided a practical guide for GPs on how their role is instrumental in identifying those at higher risk of HDIP early and escalating their antenatal care pathway accordingly, commencing low-dose aspirin and calcium from as early as 12 weeks in women at higher risk of PET,[2,4,6,7] monitoring HDIP in the postpartum period, and undertaking ongoing cardiovascular risk surveillance.

Box 3. Workup of hypertensive disorder in pregnancy[1,2,6]

Assessment of proteinuria

- Bedside urinalysis: positive if 1+; send urine for quantitative analysis
- Protein-creatinine ratio: positive if ≥30 mg/mmol
- Albumin-creatinine ratio: positive if ≥8 mg/mmol

PET bloods

- FBE: looking for thrombocytopenia
- UEC: looking for raised creatinine
- LFTs: looking for raised transaminases
- Coagulation studies: looking for increased coagulopathy

Foetal ultrasound assessment

- For chronic hypertension → Early dating ultrasound then growth scans at 28, 32 and 36 weeks' gestation
- For gestational hypertension → Growth scan at time of diagnosis then 3–4 weekly
- For pre-eclampsia → Growth scan at time of diagnosis then fortnightly plus fortnightly AFI + Doppler assessment OR
- As otherwise directed by specialist care

AFI, amniotic fluid index; FBE, full blood examination; LFT, liver function test; PET, pre-eclampsia; UEC, urea, electrolytes, creatinine.

Key points

- The spectrum of HDIP includes gestational hypertension, chronic hypertension, PET/eclampsia and PET superimposed on chronic (pre-existing) hypertension.
- Prophylactic aspirin and calcium should be commenced as early as 12 weeks (and before 16 weeks) in women at higher risk of PET.
- Labetalol, methyldopa and nifedipine modified-release tablets have demonstrated safety and efficacy in managing HDIP.
- In the postpartum period, GPs will need to provide regular reviews to monitor their patients' blood pressure based on their control, including titrating their antihypertensive therapy if they are still requiring it.
- It is reasonable to check blood pressure and perform a cardiovascular risk assessment annually in women who have had an HDIP and who do not have essential hypertension.

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References

1. Magee LA, Pels A, Helewa M, Rey E, Von Dadelszen P. Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy: Executive summary. JOGC 2014;36(5):416–38. Available at www.jogc.com/article/S1701-2163(15)30588-0/fulltext#%20 [Accessed 22 January 2024].
2. Society of Obstetric Medicine Australia and New Zealand (SOMANZ). Hypertension in pregnancy guideline. SOMANZ, 2024. Available at www.somanz.org/content/uploads/2024/01/SOMANZ_Hypertension_in_Pregnancy_Guideline_2023.pdf [Accessed 2 March 2024].
3. Mammaro A, Carrara S, Cavaliere A, et al. Hypertensive disorders of pregnancy. J Prenat Med 2009;3(1):1–5.
4. NHS Wales. Guidelines for management of hypertensive disorders in pregnancy. NHS Wales, 2020. Available at https://wisdom.nhs.wales/health-board-guidelines/cwm-taf-maternity-file/hypertensive-disorders-in-pregnancy-management-of-ctm-guideline-2020-pdf [Accessed 22 January 2024].
5. Kattah AG, Garovic VD. The management of hypertension in pregnancy. Adv Chronic Kidney Dis 2013;20(3):229–39. doi: 10.1053/j.ackd.2013.01.014.
6. National Institute for Health and Care Excellence. Hypertension in pregnancy: Diagnosis and management. NICE, 2023. Available at www.nice.org.uk/guidance/ng133/chapter/Recommendations [Accessed 22 January 2024].
7. New Zealand College of Midwives. Consensus statement: Reducing the risk of developing pre-eclampsia. New Zealand College of Midwives, 2018. Available at www.midwife.org.nz/wp-content/uploads/2018/09/Reducing-the-risk-of-developing-pre-eclampsia-2018.pdf [Accessed 22 January 2024].
8. Beech A, Mangos G. Management of hypertension in pregnancy. Aust Prescr 2021;44(5):148–52. doi: 10.18773/austprescr.2021.039.
9. Jiang R, Wang T, Li B, He J. Clinical characteristics and pregnancy outcomes of atypical hemolysis, elevated liver enzymes, and low platelets syndrome: A case series. Medicine (Baltimore) 2020;99(18):e19798. doi: 10.1097/MD.0000000000019798.
10. Pokharel SM, Chattopadhyay SK, Jaiswal R, Shakya P. HELLP syndrome—A pregnancy disorder with poor prognosis. Nepal Med Coll J 2008;10(4):260–63.