Diagnosis and treatment of hypertension and pre-eclampsia in pregnancy in New Zealand: A clinical practice guideline 2017 (Preview)

Audrey Long
Background

• NZ Ministry of Health
• 2009 Maternity Quality initiative
• Consistency of service provision
• Hypertensive disorders affect 5-10% pregnancies
• Pre-eclampsia affects 3-8% pregnancies in NZ
• Variation between DHBs
## Guideline Development Team

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Treaty of Waitangi

• Principles of Partnership, Participation, Protection
• Central to improving Maori health
• Considered at all points in the guideline
definition n. 1.
The teacher gave definition of the new words.
Hypertension

• Systolic BP ≥ 140 mmHg

OR

• Diastolic BP ≥90 mmHg

• Measured on two or more consecutive occasions at least 4 hours apart
A rise in BP of 30mmHg systolic or 15mmHg diastolic, is important to note and may be of clinical importance, but it no longer used to diagnose hypertension
Chronic/Pre-existing Hypertension

• Hypertension confirmed pre-conception or prior to 20 weeks
• With or without known cause
• Measured on 2 or more occasions at least 4 hours apart
Gestational Hypertension

• New onset of hypertension after 20 weeks (in a woman who was normotensive before 20 weeks)
  – BP ≥140/90
  – Without any of abnormalities which define pre-eclampsia
  – Return of BP to normal within 3 months postpartum
Pre-eclampsia

• New onset of hypertension after 20 weeks (in woman who was normotensive before 20 weeks)

OR

• Superimposed on pre-existing hypertension

AND

• co-existence of one or more of the following new onset conditions :-
Pre-eclampsia – new onset conditions

• **Proteinuria** - PCR ≥ 30mg/mmol or ≥2+ dipstick testing confirmed by PCR

• **Maternal organ dysfunction**
  – Renal insufficiency
  – Liver involvement
  – Neurological complications
  – Haematological complications

• **Uteroplacental dysfunction**
  – Fetal growth restriction, abruption
Proteinuria is not essential for a pre-eclampsia diagnosis

24-hour urine protein is not usually necessary – no more predictive than spot PCR

Elevation in serum uric acid is poor predictor of pre-eclampsia
Severe features of Pre-eclampsia

- Severe hypertension ($\geq 160/110$)
- Thrombocytopenia
- Impaired liver function
- Progressive renal insufficiency
- Pulmonary oedema
- New onset headaches and visual disturbances
- HELLP syndrome
- Eclampsia
Unstable pre-eclampsia

• Women with pre-eclampsia who have:
  – Worsening blood results
  – Severe hypertension not controlled by antihypertensives

‘Fulminating Pre-eclampsia’
Eclampsia

- New onset seizures in association with pre-eclampsia
- Severe manifestation of pre-eclampsia
- May be the presenting feature
- Self-limiting, no persistent clinical neurological features, not caused by pre-existing neurological conditions
HELLP

- **Haemolysis**, **Elevated Liver enzymes**, **Low Platelet count**

- Platelet count <100x10⁹/L
- Elevated transaminases
- Microangiopathic haemolytic anaemia with red cell fragments on blood film
Recommendations and Key priorities for implementation

RECOMMENDED
Recommendations – GRADE approach

• Quality of evidence
  – Study limitations
  – Consistency of effect
  – Imprecision
  – Indirectness
  – Publication bias

• Strength Recommendation
  – Extent of confidence that benefits of recommended intervention outweigh its harms or vice versa
Key priorities for implementation (1)

• Major risk factors for developing pre-eclampsia include:
  – History of pre-eclampsia or HELLP
  – Chronic hypertension
  – Pre-existing diabetes
  – Renal disease
  – Autoimmune diseases
  – Family history
  – Oocyte donation

• Risk factors should be identified at booking, referral made and preventative therapies commenced
Prediction

• Biomarkers
  – Endothelial dysfunction is associated with antigenic regulators and oxidative stress markers
  – PlGF, s-Flt-1, PAPP-A, PP-13, hCG
  – S-Flt-1/PlGF ratio – promise as a predictive test

• Uterine artery flow
  – Trophoblast invasion of spiral arteries, leading to mal-development of uteroplacental perfusion

• Best prediction: combination of PlGF at 15 weeks, with clinical variables – BP, FHx PE, Hx fertility treatment

✅ Area of emerging evidence
Predictive testing - Recomendations

• Models for predicting pre-eclampsia, which combine different biochemical markers and uterine artery Doppler for all women have shown mixed results and are currently not recommended for use.

• Although some promise as potential screening tools, the evidence and experience of use in clinical settings is not conclusive enough to include in this guideline.
Key priorities for implementation (2)

• Women at high risk are recommended to commence low dose aspirin and calcium BEFORE 16 weeks gestation
  – Reduce risk of developing pre-eclampsia and adverse events such as preterm birth
Prevention

• Aspirin 100mg daily
  – Women can remain on it until birth
  
  Taking at bedtime/evening may reduce blood pressure

• Calcium
  – 1G elemental intake/day
  – 1.25g Calcium carbonate provides 500mg elemental calcium
Key Priorities for implementation (3)

- Women who develop severe hypertension in pregnancy ($\geq 160/110$) should be treated with antihypertensive.
- Consider treatment for women with gestational hypertension $\geq 140/90$. 
Antihypertensives

• First line antihypertensives include:
  – Labetolol
  – Nifedipine
  – Methyldopa

• Target BP
  – sBP 130-150 mmHg and dBP 80-100 mmHg
  – <130/80 no better than <140/90 for progression to severe hypertension or outcomes for baby
Acute Lowering of Hypertension

• Severe hypertension ≥ 160/110
• Nifedipine – 10mg conventional release oral tablet
• Labetolol – initially 20mg IV bolus over 2 minutes
• Hydralazine – initially 5-10mg IV bolus over 3-10 minutes (5mg if fetal compromise)

Consider IV bolus crystalloid fluid 200-300mls with first dose hydralazine
Key Priorities for implementation (4)

• Women with pre-eclampsia should be managed as inpatients
Key priorities for implementation (5)

- Magnesium Sulphate is indicated in women with eclampsia
- Should be considered in women with severe pre-eclampsia BUT primary importance is BP control
Magnesium Sulphate

• Prevent eclampsia or treat seizure:
  – Loading dose - 4G over 10 minutes
  – Maintenance dose 1G/hour
  – ECG monitoring and inform anaesthetist
• Recurrence of seizure:
  – 2G IV over 10 minutes
  – Maintenance dose of 1G/hour (or 2G/hour)
  – Check for hyporeflexia and reduced respiratory rate
• Intramuscular dose
  – Suitable for retrieval and transfer
  – Two deep IM injections - 4g MgSO4 50% solution into each buttock
  – Maintenance dose 5G MgSO4 50% by deep IM every 4 hours

Ensure Calcium Gluconate available
Key Priorities for implementation (6)

• When considering timing of birth, severity of hypertensive disease, gestation and maternal and fetal wellbeing need to be taken into account
Key Priorities for implementation (7)

• Preferred mode of delivery is *vaginal* unless contraindicated by other maternal or fetal factors
Mode of birth

• <28 weeks IOL likely to be less successful and maternal & fetal disease likely to be more severe
• Neonatal outcomes better even if IOL ends in CS
• Eclampsia is NOT an indication for CS

Use of ergometrine or Syntometrine© is contraindicated in hypertensive cases
Key Priorities for implementation (8)

- Spinal anaesthesia or combined spinal and epidural anaesthesia (CSE) are the preferred techniques for CS

- Fluid preloading not required
- If GA – rapid sequence induction is preferred
- CVP monitoring is not usually required
- Pulmonary catheter is not recommended
- Peripheral arterial line is not required, but can be useful for monitoring BP
- Mg SO4 can continue during CS
- Fluid restriction advisable (80-85mls/hour total fluids in severe pre-eclampsia)
Key priorities for implementation (9)

- Women with hypertension in pregnancy should be monitored for postpartum onset or exacerbation of pre-eclampsia as there is frequently a rise in BP around day 3-5

- Be aware of postpartum Eclampsia

- Women with pre-eclampsia are at increased risk of VTE
Key priorities for implementation (10)

- Women who have developed gestational hypertension or pre-eclampsia should have regular cardiovascular/renal risk assessment in the long term.
- Comprehensive discharge letter to GP should include long term monitoring recommendations.
Women’s Experience

• Educational tools should be available – health literacy and demographic diversity
• Equity of care – in particular Maori & Pacific women
• Women and Whanau should be actively involved and informed throughout health-decision making process
• Complications associated with HIP can be stressful – need for psychological care & support
• Normal screening for PN depression imperative
• Women should have the opportunity to debrief
Resource Implications

• Recommendations have been made based on best evidence without restriction of cost or resource implications

• Increased monitoring for women at high risk or diagnosed with hypertensive disorders – demands on LMCs

• Long term monitoring – cost to women in additional GP attendance

• Psychological care and support – increased demands on mental health services and DHBs

• Likely that costs offset by reduction in maternal and neonatal adverse events