COMPLICATIONS OF PREGNANCY

HYPERTENSION IN PREGNANCY

MIDWIFERY CARE

HYDRALAZINE ANTIHYPERTENSIVE THERAPY

Keywords: Hydralazine, antihypertensive therapy in pregnancy, hypertension in pregnancy

QUICK REFERENCE GUIDE

MANAGEMENT DURING A HYPERTENSION CRISIS

Notify the Medical Officer immediately if blood pressure (BP) is ≥ 170/110. The Medical Officer will make the decision if intravenous (IV) hydralazine is to be administered.

RECONSTITUTION OF INTRAVENOUS HYDRALAZINE

Dissolve hydralazine 20mg powder with 2mL of Sodium Chloride 0.9% in the ampoule. Further dilute to 20 mL with Sodium Chloride 0.9%. This equates to Hydralazine 1mg per mL.

DOSAGE AND REGIMEN

INITIAL DOSE (PREFERABLY GIVEN BY A MEDICAL OFFICER)

Administer intravenously 5 - 10mg hydralazine (equates to 5 - 10mL of the diluted mixture) slowly over 2 minutes. Note: Administer a 5mg first dose if fetal compromise.

REPEAT DOSE

If the desired BP is not obtained in the 20-30 minutes following the first dose notify the Medical Officer. A further dose of 5mg-10mg of intravenous hydralazine (equating to 5mL – 10 mL of the diluted mixture) may be ordered to be given slowly over 2-4 minutes. Note: Inform the Medical Officer immediately if the repeat dose is ineffective after 30 minutes. This may require repeated doses or even an IV infusion of hydralazine titrated to the blood pressure response. See Clinical Guideline Section P: Hydralazine for administration rates.

OBSERVATIONS

- Monitor the maternal blood pressure (BP), heart rate, maternal arterial oxygen saturation levels (with pulse oximetry), and respiratory rate 5 minutely for 15 minutes after administration, then 15 minutely for 1 hour. Thereafter monitor the above observations 30 minutely until the BP is stable and within an acceptable range. Liaise with the Medical Officer about frequency of monitoring at this stage.
  
  Note: Repeat the initial frequency of BP measurements if a second / repeat dose of hydralazine is given.

- Monitor fluid balance to avoid fluid overload.

- Monitor the fetal heart rate continuously.
AIM

- To reduce and control severe hypertension (blood pressure ≥ 170/110).

BACKGROUND

Parenteral hydralazine, labetolol and oral nifedipine are the most common drugs used to control acute severe hypertension in women with pre-eclampsia.\(^1\) See Hypertension in Pregnancy: Medical Management. Hydralazine is suggested as a second line agent in lowering blood pressure (BP) in pre-eclampsia.\(^2\) Some groups regard intravenous hydralazine as the choice for first line treatment, but it has been associated with significantly higher maternal side-effects and worse maternal and perinatal outcomes than labetolol and nifedipine.\(^3\) A Cochrane review on high BP treatment in pregnancy suggested that clinician’s experience and women’s preferences should guide treatment until further evidence can identify the most effective antihypertensive.\(^4\)

Intravenous hydralazine may cause a rapid fall in BP which may impair placental perfusion. This can lead to fetal distress\(^5\) therefore continuous fetal heart monitoring should be used.\(^2,4\)

Hydralazine is a direct-acting arteriolar vasodilator which following administration is effective within 5-15 minutes but can cause a fall in BP up to 12 hours. Its maximum effect is usually noted between 10-80 minutes. The circulating half life is approximately 3 hours, and the half-time of its effect on BP is approximately 10 hours.\(^5\)

KEY POINTS

1. Urgent reduction of severe hypertension is essential in antepartum or postpartum women to reduce the risk for cerebral vascular accident, organ failure\(^6\) or seizures.\(^6\)
2. Hydralazine is administered as an intravenous dose of 5-10mg every 20-30 minutes to control hypertension of ≥170 systolic and / or ≥110 diastolic.\(^2\)
3. The preferred administration method is by intravenous (IV) injection or by IV infusion.\(^7\)
4. Women with renal or hepatic impairment may require a reduced dose of hydralazine.\(^7\)
5. Both antepartum and postpartum severe hypertensive episodes are to be managed in the Adult Special Care Unit or in the Labour and Birth Suite. However hydralazine may be administered in the wards to enable stabilisation of the maternal condition prior to transfer.
6. Hydralazine may result in sodium and fluid retention, producing oedema\(^2\) and reduced urinary output. A concomitant use of a diuretic may be useful.\(^8\) Urinary output should be monitored.

SIDE EFFECTS

Tachycardia, palpitations, flushing, angina symptoms, headache, arthralgia, GI disturbances, diarrhoea, nausea, vomiting. Side effects have been deleted from this!!!!)

ADMINISTRATION OF HYDRAZINE

See Clinical Guideline Hydralazine for detailed information. The guideline in this section provides information of oral, intravenous, intramuscular and continuous IV infusion doses.

PRIOR TO ADMINISTRATION

1. Two qualified members of staff (Registered Midwives and/or Doctors) are to check the following:
   - The medication written order for the correct patient, including allergies, the six patient rights (right patient, time/date, drug, dose, route, and documentation),\(^3\) and expiry of the medication / fluids.
   - See also Clinical Guideline Checking and Administration of Intravenous Drugs by Medical and Nursing / Midwifery Staff.

2. If there is a risk of hypovolaemia consider giving IV fluids (250mL bolus) prior to administering hydralazine.\(^5\) This is only necessary if the clinical assessment and medical review indicates a likelihood of significant volume depletion. The Medical Officer should indicate the volume of fluid to be infused in this circumstance.
INTRAVENOUS DOSAGE AND REGIME

Aim to lower the diastolic BP to 90 to 100 mmHg.⁸

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INITIAL DOSE

Administer intravenously 5 - 10mg hydralazine (equates to 5 - 10 mL of the diluted mixture) slowly over 2 minutes.²,⁸,¹⁰ **Note:** Administer a 5mg first dose if fetal compromise.²

Slow injection avoids a sudden drop in mean arterial pressure which would impact on cerebral and uteroplacental perfusion.⁶

REPEAT DOSE

If the desired BP is not obtained in the 20-30 minutes following the first dose notify the Medical Officer. A further dose of 5mg–10mg of intravenous hydralazine (equating to 5mls – 10 mL of the diluted mixture) may be ordered to be given slowly over 2 - 4 minutes.²,⁸ Max 30mg.²

MATERNAL AND FETAL OBSERVATIONS

MATERNAL

Check BP, heart rate, maternal oxygen saturation levels, and respirations⁶:

- 5 minutely for 15 minutes following administration
- then 15 minutely for 1 hour
- 30 minutely thereafter until BP remains stable and within an acceptable range in accordance with Medical Officer instructions
- Fluid balance is to be monitored to avoid overload.⁶
- Women with pre eclampsia are at an increased risk of fluid overload.¹¹,¹² Monitoring arterial oxygen saturation (by pulse oximetry), respiratory rate and BP will detect deterioration in pulmonary function.⁶,¹³-¹⁵

**Note:** If a repeat dose is given the frequency of performing a BP should follow the regime as for the initial dose.

FETAL

Monitor the fetal heart rate continuously in antepartum women.² A rapid decrease in BP may effect uteroplacental perfusion and result in fetal distress.²,⁴

MANAGEMENT OF PERSISTENT OR REFRACTORY SEVERE HYPERTENSION

Notify the Obstetric team immediately should the BP remain elevated despite hydralazine therapy (>160/110 for more than 30 minutes after the dose has been administered). This may require repeated doses or even an intravenous infusion of hydralazine, titrated to the blood pressure response.² For a more sustained BP lowering effect, concurrently administer longer acting oral agents,⁷ such as Labetolol, Nifedipine, and Methyldopa.¹⁶.
REFERENCES / STANDARDS


National Standards – 1 - Care Provided by the Clinical Workforce is Guided by Current Best Practice
4 - Medication Safety
9 - Recognising and Responding to Clinical Deterioration in Acute Health Care

Legislation – Poisons Act 1964

Related Policies – WA Health Clinical Deterioration Policy (2014); OD 0376/12; Medication Administration: Role of the Enrolled Nurse

Other related documents –
- KEMH Clinical Guidelines:
  - Section B: 2.2 Hypertension in Pregnancy; 2.2.1 Hypertension in Pregnancy: Medical Management; 2.2.3.9 Labour and Birth- QRG Hydralazine Antihypertensive Therapy;
  - Section P: 2.1 Administration of Medications; 2.3.2 Parenteral Drug Dilution Guidelines; 2.3.3 Standard Procedures for Reconstitution and Administration of Intravenous Drugs; 2.3.4 Checking and Administration of Intravenous Drugs by Medical and Nursing/Midwifery Staff; A-Z Medications: Hydralazine
- E-learning: Global Voices: Pre-eclampsia and Eclampsia modules: K2 Pre-eclampsia

RESPONSIBILITY

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<th>Policy Sponsor</th>
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<td>Initial Endorsement</td>
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<td>Last Reviewed</td>
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