

Metaraminol infusion

Introduction

Metaraminol is an intravenous vasoconstrictor used in theatre to increase blood pressures. While it has both α_1 and β agonist activity, the α_1 effect predominates, resulting in an increase in blood pressure often accompanied by a reflex bradycardia. The drug is an effective vasoconstrictor but does not have any inotropic activity and although blood pressure may increase, there may be reduced perfusion to vital organs. The use of metaraminol is only permitted in an HDU or ICU setting and never in a general ward.

Indications

- Short term (up to 12 hours) treatment of hypotension related to sedation or post general anaesthesia.
- Treatment of patients with hypotension caused by sympathetic blockade from spinal or epidural anaesthesia when the cause of the hypotension clearly relates to the sympathetic block. (for the duration of the blockade only).
- Short term (up to 6 hrs) treatment of hypotension from other causes (note contraindications below) pending insertion of a central line and use of noradrenaline as a definitive treatment.
- When placement of central venous catheter is not possible e.g. long term dialysis patients.
- At the direction of the critical care consultant following clinical review by ICU.

Contra indications

- Hypovolemia
- Cardiogenic shock
- Hypotension secondary to arrhythmias
- Septic shock
- Hypersensitivity to metaraminol, including sulphites (more prevalent in patients with asthma).
- Severe ischaemic heart disease or cardiomyopathy
- Patients on monoamine oxidase inhibitors, tricyclic antidepressants and linezolid as the combination can exaggerate the patient response to metaraminol.
- Patients on anti-arrhythmics especially beta blockers and digoxin as the combination can precipitate ectopic arrhythmic activity

Prescription

The prescription should include the following details:

- Date
- Drug name and dose
- Diluent and volume
- Target mean arterial or systolic blood pressure
- Starting infusion rate
- Range of acceptable infusion rates

Preparation and Administration

Presentation: 10mg/ml in 1ml ampoules

Administration: Via the largest peripheral vein available. Where CVC is available noradrenaline is the preferred drug.

Metaraminol must be administered through a designated lumen only and should not be administered with any other medications.

Critical Care Guidelines

Dilution and preparation:

In Theatre	In Critical Care
<ul style="list-style-type: none">• Add 20mg (2 ampoules) metaraminol to 38ml of 0.9% sodium chloride (final concentration 500 micrograms/ml) in a Luer Lock 50ml syringe.• Use a syringe driver.• Use an antireflux valve if administered with IV fluids	<ul style="list-style-type: none">• Add 50mg (5 ampoules) metaraminol to 95ml of 5% dextrose (final concentration 500 micrograms/ml).• Use a volumetric pump

Infusion rate

- 0 -10 ml per hour, titrated to a target mean blood pressure.
- The infusion rate should be increased by 0.5- 2ml/hr to achieve target BP. Half-life is 1-2 minutes so titrate approximately every 10 minutes to ensure safe titration.
- The infusion rate should be reduced if the blood pressure is high. Decrease the infusion in 1ml/hr increments until the target is achieved.

Changing the syringe

- Metaraminol does not need to be 'double pumped' like noradrenaline - a short period of disconnection will not cause a significant drop in blood pressure.
- The new infusion can be prepared in advance, the old one disconnected and the new one replaced within the space of 3-4 min with minimal effect on blood pressure

Side effects:

- Hypertension. This may persist after cessation of the drug. Effects of the drug after IV administration may last from 20 mins to 1 hour.
- Headache
- Bradycardia – occurs as a response to the increased blood pressure
- Tissue necrosis after extravasation of drug
- Bronchospasm

Monitoring:

- Continuous ECG monitoring should be in situ for all patients
- Every patient should have an arterial line in situ for invasive monitoring
- Monitor peripheral vein infusion sites for evidence of extravasation or tissue necrosis.
- Peripheral oxygen saturations and urine output must be monitored hourly.

Clinical Use and Safety

- There should be an anaesthetic review on leaving recovery room to consider suitability of continuing metaraminol.
- Document the target mean arterial pressure (MAP) in charts and on TRAK.
- Start infusion at 5 ml per hour and titrate every 10 minutes by 1-2ml/hr until desired mean arterial blood pressure is achieved.

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Critical Care Guidelines

- Always conduct clinical review if the dose is increasing.
- If the metaraminol infusion does not achieve the target BP or is continued for a period of more than 24 hours a full clinical review is required including discussion with senior anaesthesia/ICU clinician and consideration of insertion of a central line and commencement of noradrenaline.
- If a patient in recovery is receiving metaraminol at an infusion rate of 10 ml/hr or greater, insertion of a central line should be considered prior to admission to HDU unless specifically discussed with the critical care consultant on call
- Always consider fluid loading first

Reasons for changing to noradrenaline:

- If the infusion has been continued for over 48hrs
- If the infusion rate exceeds 10ml/hr (5mg/hr)
- If there is a central line in place for a different reason
- If dose requirement is high and increasing, needing frequent syringe changes and high volumes

Discontinuation

Metaraminol should be gradually tapered down and discontinued once target BP is consistently achieved with infusion of 2ml/hr or less.

IV cannula should be flushed with 5 ml 0.9% sodium chloride to remove residual drug

Critical Care Guidelines