

DRUGS

Objectives

- To understand the indications, doses and actions of drugs used in resuscitation
- To understand the indications, doses and actions of some of the common drugs used to treat peri-arrest arrhythmias

Epinephrine

Indications:

- All cardiac arrest rhythms
- Bradycardia
- Special circumstances:
 - anaphylaxis

Epinephrine

Dose:

- 1 mg intravenous 10 ml 1:10,000 (1 ml 1:1,000) every 2-3 mins during resuscitation
- 2-3 mg via tracheal tube
- 2–10 mcg min⁻¹ for atropine resistant bradycardia
- 0.5ml 1:1,000 i.m., 3-5 ml 1:10,000 i.v. in anaphylaxis, depending on severity

Epinephrine

Actions:

- α agonist
 - arterial vasoconstriction
 - ↑ systemic vascular resistance
 - ↑ cerebral and coronary blood flow

- β agonist
 - ↑ heart rate
 - ↑ force of contraction
 - ↑ myocardial O₂ demand
(may increase ischaemia)

Atropine

Indications:

- Symptomatic bradycardias

Atropine

- Bradycardia
 - 0.5 mg i.v., repeated as necessary,
maximum 3 mg

Atropine

Actions:

- Blocks effects of vagus nerve
- Increases sinus node automaticity
- Increases atrioventricular conduction

Amiodarone

Indications:

- Refractory VF / Pulseless VT
- Haemodynamically stable VT
- Other resistant tachyarrhythmias

Amiodarone

Dose:

- Refractory VF / Pulseless VT
 - 300 mg in 20 ml 5% dextrose, bolus i.v.
- Stable tachyarrhythmias
 - 150 mg in 20 ml 5% dextrose over 10 mins
 - Repeat 150 mg if necessary
 - 300 mg in 100 ml 5% dextrose over 1 hour

Amiodarone

Actions:

- Lengthens duration of action potential
- Prolongs Q-T interval
- Mild negative inotrope - may cause hypotension

Magnesium

Indications:

- Shock refractory VF
(with possible hypomagnesaemia)
- Ventricular tachyarrhythmias
(with possible hypomagnesaemia)
- Torsades de pointes

Magnesium

Dose:

Shock Refractory VF

- 2–4 ml 50 % (4–8 mmol) i.v. over 1-2 mins
- Can be repeated after 10-15 minutes

Other circumstances

- 5 ml of 50% (10 mmol) i.v. over 30 mins

Magnesium

Actions:

- Depresses neurological and myocardial function
- Acts as a physiological calcium blocker

Lidocaine

Indications:

- Refractory VF / Pulseless VT
 - *when amiodarone is unavailable*
- Haemodynamically stable VT
 - *as an alternative to amiodarone*

Lidocaine

Dose:

- Refractory VF / Pulseless VT
 - 100 mg i.v.
 - further boluses of 50 mg, max 200 mg
- Haemodynamically stable VT
 - 50 mg i.v.
 - further boluses of 50 mg, max 200 mg
- Reduce dose in elderly or hepatic failure

Sodium Bicarbonate

Indications:

- Severe metabolic acidosis (pH < 7.1)
- Hyperkalaemia
- Special circumstance
 - Tricyclic antidepressant poisoning

Sodium Bicarbonate

Dose:

- 50 mmol (50 ml of 8.4% solution) i.v.

Sodium Bicarbonate

Actions:

- Alkalinizing agent (increases pH)

But may:

- increase carbon dioxide load
- inhibit release of oxygen to tissues
- impair myocardial contractility
- cause hypernatraemia
- interact with adrenaline

Calcium

Actions:

- Essential for normal cardiac contraction
- Excess may lead to arrhythmias
- The trigger for cell death in the ischaemic myocardium
- Excess may impair cerebral recovery

Calcium

Indications:

- Pulseless electrical activity caused by:
 - severe hyperkalaemia
 - severe hypocalcaemia
 - overdose of calcium channel blocking drugs

Dose

- 10 ml 10% calcium chloride (6.8 mmol)

Do not give immediately before or after sodium bicarbonate

Adenosine

Indications:

- Broad complex tachycardia, uncertain aetiology
- Paroxysmal supraventricular tachycardia

Adenosine

Dose:

- 6 mg intravenously, by rapid injection

If necessary, three further doses each of 12 mg can be administered every 1–2 mins

Adenosine

Actions:

- Slows conduction across the AV node

Must only be used in a monitored environment

Naloxone

Dose:

- 0.2 - 2.0 mg i.v.
- May need to be repeated up to a maximum of 10 mg
- May need an infusion

Naloxone

Indications:

- Opioid overdose
- Respiratory depression secondary to opioid administration

Naloxone

Actions:

- Opioid receptor antagonist
- Reverses all opioid effects, particularly respiratory and cerebral
- May cause severe agitation in opioid dependence

Any Questions?