Local Anaesthetics

Local anaesthetic (LA) toxicity is characterised by CVS and CNS effects. LA toxicity most commonly occurs because of iatrogenic error.

Toxicity / Risk Assessment

Toxicity is usually secondary to accidental intravenous administration, excessive dermal application, local infiltration dose error or equipment failure (Bier's block)

Oral bioavailability in adults is low, but children may develop toxicity following large oral exposures

Bupivacaine is more cardiotoxic than other LAs

Maximum recommended doses for local infiltration

Bupivacaine: 2mg/kg (2mg/kg with adrenaline)

Lidocaine: 3mg/kg (7mg/kg with adrenaline)

Ropivacaine: 3mg/kg (3mg/kg with adrenaline)

Prilocaine: 7mg/kg

Max recommended topical/oral lignocaine: 6mg/kg

<u>Clinical features:</u>

Onset rapid if IV exposure, otherwise may be delayed

Early: dizziness, perioral numbness, anxiety, tinnitus

Severe: Confusion, seizures, coma, arrhythmias, cardiovascular collapse, respiratory depression/apnoea

Methemoglobinemia can occur (prilocaine, benzocaine, lidocaine most implicated)

Management

Supportive care is the mainstay of management with attention to airway and cardiovascular state.

Hypoxia and acidosis exacerbate CNS and CVS toxicity.

Central nervous system toxicity:

- Seizures: Administer benzodiazepine first line. Example: diazepam 5 mg IV every 5 minutes as necessary

Broad complex ventricular arrythmias (QRS interval prolongation): *see Sodium Bicarbonate guideline*

- 1-2 mL/kg of 8.4% sodium bicarbonate (1-2 mmoL/kg) IV every 3-5 minutes,
- aiming for a serum pH of 7.45-7.55
- maximum dose of sodium bicarbonate is 6 mL/kg of 8.4% solution (6 mmol/kg)

Hypotension: 20 mL/kg IV crystalloid followed by inotropes as required

Intravenous Lipid Emulsion Therapy

- Administer in cases of resistant severe cardiovascular toxicity
- Intravenous lipid emulsion 20% 1.5 ml/kg IV over one minute, then infuse 15 mL/kg/hour until CVS stability is obtained. Do not exceed 12 mL/kg cumulative dose *(see separate guideline)*

Cardiac arrest

- ACLS, prolonged CPR to achieve ROSC may be required (> 1 hour)
- Consider ECMO early in treatment resistant cardiac arrest (discuss with clinical toxicologist)

Methaemoglobinaemia: 1-2 mg/kg methylene blue IV over 5 minutes (*see separate guideline*)

Disposition:

- All patients should be observed for at least 4 hours following a potentially toxic dose of a LA