Tricyclic Antidepressants (TCAs)

Significant TCA OD produces rapid onset of cardiovascular and neurological toxicity. Sodium Bicarbonate ($NaHCO_3$) is the antidote and is often life saving

Toxicity / Risk Assessment

One tablet in a child may produce significant toxicity

Onset of clinical effects is within 30-90 minutes

Clinical toxicity is dose dependent

5-10 mg/kg: Mild toxicity (worse in children)

- ↑HR, mild CNS depression / agitation, mydriasis

>10 mg/kg: Moderate toxicity

- ↑Anticholinergic features, warm dry skin, urinary retention, CNS depression / agitated delirium

>20 mg/kg: Severe toxicity

- Seizures, coma, hypotension, arrhythmias, death

Clinical toxicity is made worse with acidosis

- α receptor antagonism: hypotension
- Na^+ channel blockade: myocardial dysfunction
- **ECG manifestations**:
  - R wave in aVR >3 mm or >0.7 amplitude of S wave is most specific finding for TCA toxicity
  - Sinus tachycardia, ↑QRS / ↑QT intervals
  - ↑QRS: >120ms ↑risk of seizures, >160ms ↑risk ventricular arrhythmias

Management: Patients with ↓GCS + ↑HR and history of TCA exposure in the past 1-2 hours require immediate intubation. **Decontamination**: Activated charcoal 50 g via NGT post intubation (discuss with clinical toxicologist if the patient presents < 1 hour post ingestion)

Antidote: Sodium Bicarbonate ($NaHCO_3$) 8.4% solution

- Indications: seizures, arrhythmias, ↑QRS (>120ms), hypotension, on induction immediately prior to intubation
- Bolus dose – 1 mL/kg 8.4% $NaHCO_3$ solution as a slow (2 minutes) intravenous bolus
- Repeat bolus doses every 5 minutes to rapidly acquire pH in 7.50-7.55 range
- $NaHCO_3$ infusion is **NOT** indicated to maintain serum pH. Maintain with hyperventilation.

Seizures (in the setting of acute toxicity <6 hours)

- Bolus $NaHCO_3$ solution as above. Diazepam 5 mg IV if seizure continues. Prepare for intubation.

Hypotension

- Initial 20 ml/kg crystalloid with **CONCURRENT** administration of 8.4% $NaHCO_3$ (as above)
- Norepinephrine for resistant hypotension **despite** IV fluid + correction of acidosis + Rx of arrhythmias

Na^+ channel blockade with QRS duration > 120ms +/- ventricular arrhythmias

- 1 mL/kg 8.4% $NaHCO_3$ slow IV bolus, repeat every 5 minutes to achieve serum pH 7.50-7.55
- Resistant arrhythmia with pH 7.50-7.55: Lidocaine 100 mg as an IV bolus (discuss with Clinical Toxicologist)
- Avoid β-blockers or amiodarone. Consider 3% hypertonic saline (100 mL) for resistant cardiac toxicity

Disposition

- Discharge pending mental health assessment if clinically well (not tachycardic and normal conscious state) with normal ECG at 6 hours post exposure