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TREATMENT OF CALCIUM CHANNEL BLOCKER (CCB) OVERDOSES

SUPPORTIVE TREATMENT:

The treatment of hypotension without heart block should not usually require calcium or any cardioacive medication.

Hypotension alone should initially be treated with volume expansion and vasopressor agents

SPECIFIC TREATMENT:

1. Calcium administration

- **Indication:**
  - ♦ Calcium is given to reverse hypotension and improve cardiac conduction defects.
  - ♦ It is primary indicated in patients with heart block

  Calcium Formulations

  ♦ Parenteral: 10% calcium chloride 10 mL = 1 g contains 13.6 mEq calcium
  10% calcium gluconate 10 mL = 1 g contains 4.65 mEq calcium

- **Adult dosage**

  CALCIUM CHLORIDE

  - 10 mL of 10% calcium chloride i.v. over 5 min, repeated every 10-20 min for 3-4 more doses.

  OR **CALCIUM GLUCONATE**

  - 30 mL of 10% calcium gluconate (0.6 mL/kg) i.v. over 5 min. If there is no response, repeated every 10-20 min for 3-4 more doses.
  - Then, continuous infusion of doses 0.6-1.5 mL/kg/hr (as high as 20 ml/hr) infused for 10 hr have been used.

  Note: If there is an initial response to calcium, a continuous infusion may be needed.

- **Children dosage**

  CALCIUM CHLORIDE

  - 0.2 mL of 10% calcium chloride up to adult dose i.v. over 5 min, followed by infusion of 0.2-0.5 mL/kg/hr if a beneficial effect is observed.

OR **CALCIUM GLUCONATE**

- 0.6 mL/kg of 10% calcium gluconate i.v. over 5 min, titrating to the adult dose if needed.

Note:

- Calcium chloride can be irritating to tissue if extravasated, leading to necrosis and the need for the skin grafting.
- In overdose with CCB, the serum calcium concentration remains normal.
- Serum calcium should be measured when more than 2 doses are administered, but note that **hypercalcemia is the aim of treatment**.

2. High-dose insulin-euglycemia therapy (HIE)

Insulin increases myocardial glucose utilization or alters myocardium calcium handling

- **Indication:**

♦ Patients still have hypotension and bradycardia after volume loading, correction of acidosis and calcium salts administration.

- **Administration and Dosage:**

(Central venous catheterization for volume status assessment and infusion of high concentration medicine should be done before start HIE therapy)

- **Dosage:** **Initial dose**

- Regular insulin 1 unit /kg IV bolus plus 50% dextrose 50 mL IV
(if blood glucose > 300 mg%, the dextrose bolus is not necessary)

Followed by infusion

- Regular insulin 0.5 - 1 unit/kg/hr titrated up to 2 unit/kg/hr if no improvement after 30 min
- Dextrose 0.5 g/kg/hr (10% DW 5mL/kg/hr, or 50% dextrose 1 mL/kg/hr), titrate to maintain euglycemia (100-250 mg/dl)

Keep “mild hypokalemia” range 2.8 -3.2 mEq/L

Plasma glucose, potassium and magnesium should be monitored

- **Adverse effects:**

Hypoglycemia , hypo K, hypo Mg and hypo PO4

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