NETS WA
Newborn Emergency Transport Service

Hypoglycaemia

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

Aim

This guideline is to guide NETS staff in the management of neonates with hypoglycaemia during a retrieval. For other health care professionals, please refer to the CAHS Neonatology Clinical Care Guidelines and/or liaise with the NETS Consultant for further assistance.

Risk

Delays in recognition and/or management of neonates with hypoglycaemia can place neonates at increased risk of deterioration and adverse events. A standardised approach to assessment and management of hypoglycaemia aims to minimise these risks.

Background

Asymptomatic hypoglycaemia is a common transient problem in most neonates. Symptomatic hypoglycaemia is an emergency and requires intravenous treatment. Symptoms include:

- CNS excitation: Irritability, Jitteriness, Seizures.
- CNS depression: Hypotonia, Lethargy, Poor feeding, Apnoea's.
- Non-specific: Temperature instability, Sweating, Tachycardia.

Definition

Definition: Blood glucose level **< 2.6 mmol/L** in the first 24-48hours.

Abbreviations:

- IM - intramuscular
- IV - intravenous
- UVC - umbilicus venous catheter
- BGL - blood glucose level
- RDS - respiratory distress syndrome

At Risk Neonates

- Poor stores: Small for gestational age, Preterm, Placental insufficiency.
- Metabolic derangement/Hormone imbalance: Infant of diabetic mother (common); Inborn error of metabolism, Congenital adrenal hyperplasia, Beckwith-Wiedemann Syndrome.
- Increased consumption: Stress, RDS, Sepsis, Hypothermia, Asphyxia.
- Maternal medication: i.e. Beta blockers, Valproate

Management

- **Correct:**
  - Severe hypoglycaemia (BGL < 1.5mmol/L) needs to be corrected promptly:
    - Glucose Gel 40% 0.5ml/Kg (Not recommended after 48hrs of age)
    - Intravenous bolus of 2 mL/kg of 10% Dextrose OR
    - IM Glucagon 100-200 mcg/kg as interim measure if difficult IV access
- **Calculate** glucose-delivery rate:
  - Term infants: 4-6 mg/kg/min.
  - Preterm infants: 6-8 mg/kg/min.
- **Screen**:
  - Indications for Hypoglycaemia Screen:
    - Severe hypoglycaemia (BGL < 1.5mmol/L)
    - Recurrent hypoglycaemia (two or more episodes of hypoglycaemia)
  - Blood Collection:
    - 1 mL of clotted blood and 1 mL of heparinised blood (2 small red top and 2 small green top tubes).
    - Request insulin, cortisol, growth hormone, glucose, ketones or β-hydroxybutyrate.

Mild - Asymptomatic, stable babies (BGL 1.5 – 2.5mmol/L)

- Glucose Gel 40% 0.5ml/Kg (Glucose Gel is NOT recommended after 48hrs of age) followed by breastfeed and EBM
- If inadequate breastfeeding, then give 7.5ml/kg Term Formula
- If enterally fed and feed volume already 7.5ml/kg, can be increased to 15 mL/kg/feed (provides 7mg/kg/min of glucose). Feeds can be increased in frequency to continuous milk feeds or fortified (if no contraindications present).
- Recheck blood glucose level after 30 minutes. If response to feed is inadequate, insert IV and commence 10% dextrose at 80-100mL/kg/day (this corresponds to a glucose-delivery rate of 5.6-7mg/kg/hr).
- Repeat blood glucose level after 30 minutes. If response inadequate, increase glucose concentration or infusion rate.

Severe Hypoglycaemia (BGL < 1.5mmol/L) or Symptomatic Babies

- Glucose Gel 40% 0.5ml/Kg (Glucose Gel is NOT recommended after 48hrs of age) AND
- Give bolus of 2 mL/kg of 10% Dextrose.
- Commence 10% dextrose at 100 mL/kg/day.
- Consider IM Glucagon 100-200 mcg/kg as interim measure if symptomatic or difficult IV access.
- If unable to site IV or if baby requires glucose concentrations > 12.5%, insert UVC.
- Repeat BGL at 30-minute intervals until PGL is above 2.6mmol/L.
- Hypoglycaemia screen (above) if it does not delay treatment significantly.

Note:

1. Beware of causing hyponatraemia with higher infusion rates. It may be preferable to increase glucose concentration rather than increase the rate.
2. Insulin levels should ideally be taken prior to the administration of dextrose. However, appropriate management should not be delayed by the acquisition of the insulin level.
3. Early referral for advice is recommended, especially in cases of difficult IV access and/or need for central venous access (UVC), suspected inborn error of metabolism and/or clinical symptoms such as seizures.
4. Infants with severe and/or prolonged hypoglycaemia, or who developed hypoglycaemic seizures should receive an MRI of the brain and will need a follow up

Calculations:

To Calculate Glucose Delivery Rate:

$$\frac{\text{Rate x \% glucose x 1000}}{100} = \text{mg/hr}$$

$$\frac{\text{mg/hr}}{\text{Weight (kg)}} = \text{mg/kg/hr}$$

$$\frac{\text{mg/kg/hr}}{60} = \text{mg/kg/min}$$

To Increase Concentration of Glucose:

$$\frac{\text{Vol x (reg\% - avail\%)}}{\text{(add\% - avail\%)}} = \text{Amount of additive glucose required (mL)}$$

Example: To make 50 ml of 13% glucose, using 50% glucose ampoules and 10% glucose bags:

$$\frac{\text{50 x (13-10)}}{\text{(50-10)}} = \frac{\text{50 x 3}}{40} = \text{3.75 mL of 50\% glucose to 46.25 mL 10\% glucose}$$

This document can be made available in alternative formats on request.

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