WEBINAR ON NDOH NEWBORN GUIDELINES

MANAGEMENT OF HYPOGLYCAEMIA

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health
Department:
Health
REPUBLIC OF SOUTH AFRICA

2030 NDP

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Hypoglycaemia: Chapter contents

Background and measurement principles
Definitions and symptoms
Risk factors and management strategies and goals
Management of Hypoglycaemia – asymptomatic, severe, persistent
When to refer, discharge criteria and follow-up

Background and measurement principles

Persistent or severe hypoglycaemia is a medical emergency ⟹ Brain injury ⟹ Prompt response

Normal transient decrease in blood glucose occurs after birth ⟹ Avoid over-treatment

- Do not measure glucose in well babies without risk factors if taking normal breast/formula feeds
- Do feed well at-risk babies before glucose measurement – check before next feed
- Do measure glucose after starting routine IV fluids – not before

Whole blood glucose is measured at bedside by **glucometers** (reagent strips) and **blood gas analysers**

Serum blood glucose is measured in the **laboratory** to confirm hypoglycaemia

Whole blood glucose is usually 15% lower than serum glucose ⟹ respond immediately if low

Definitions

Hypoglycaemia

Whole blood glucose < 2.6 mmol/l

Severe hypoglycaemia

Whole blood glucose < 1.8 mmol/l **OR**

Symptomatic hypoglycaemia

Persistent hypoglycaemia

Hypoglycaemia persisting > age 48 h

Requires additional IV fluids > age 48 h

Symptoms (signs)

One or more of:

- Jitteriness
- Sweating
- Tachypnoea or apnoea
- Tachycardia
- Pallor or cyanosis
- Hypotonia
- Poor suck/feeding
- Weak or high-pitched cry/ irritability
- Decreased level of consciousness
- Seizures

Risk Factors – Who To Screen

- Prematurity or Post-maturity
- Small or large for gestational age babies
- Intrauterine growth restriction
- Infants of diabetic mothers
- Mothers treated with beta adrenergic blockers
- Perinatal stress: hypoxia, meconium aspiration
- Haemolytic disease, polycythaemia
- Sick, symptomatic, hypothermic or fluid restricted
- Family history of hypoglycaemia
- Syndromes at risk - Beckwith-Wiedemann
- Structural midline brain abnormalities

Management Strategies And Goals

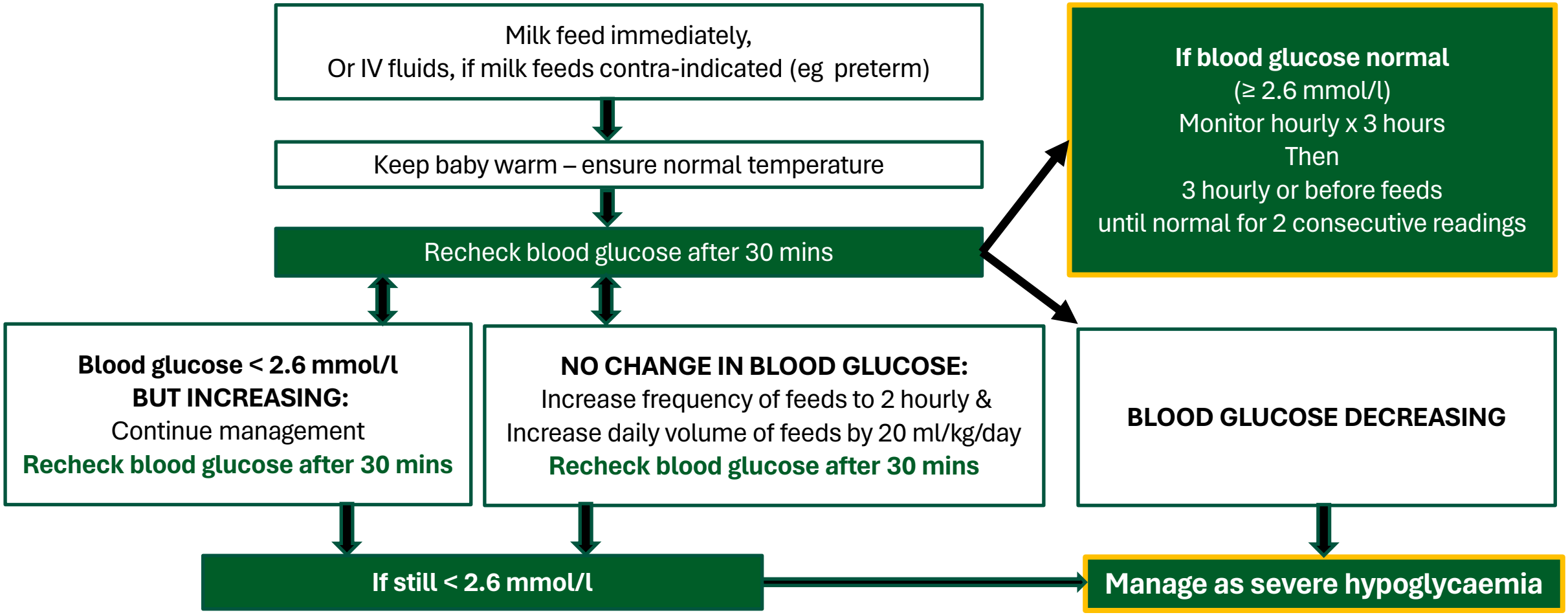
Prevent hypoglycaemia

- Start feeds/fluids within first hour of birth
- Avoid hypothermia
- Avoid measurement before started feeds/fluids

Treat hypoglycaemia

- Screen babies at risk
- Treat promptly with a stepwise approach
- Prevent long-term neurologic sequelae

Hypoglycaemia in asymptomatic well babies (1.8 – 2.5 mmol/l)



Symptomatic/severe hypoglycaemia (< 1.8 mmol/l)

EMERGENCY DRUG TREATMENT for HYPOGLYCAEMIA

GLUCAGON 0.2 mg/kg/ IM
Can repeat after 20 minutes
Maximum dose 1mg

DISCUSS WITH REFERRAL CENTRE

Consider:
Hydrocortisone 1–2 mg/kg/dose
IV or PO 6 hourly

NEVER USE UNDILUTED 50% DEXTROSE
(Due to hypertonicity)

No IV access OR Persistent SEVERE hypoglycaemia
(< 1.8 mmol/l despite treatment)

AFTER 30 MINS

Milk feed by NGT if not fed in last 2h **and/or** Insert IV line

3 ml/kg 10% dextrose IV bolus

Unable to insert peripheral IV:
Insert emergency
Umbilical Venous Catheter (UVC)
Replace with sterile UVC at referral centre

Start IV 10% dextrose at standard for GA and day of life (60 – 150 ml/kg/day)
Consider sepsis as a cause: Blood culture and start antibiotics

Persistent hypoglycaemia 1.8 – 2.5 mmol/L:
Increase volume IV infusion by 20 ml/kg/day OR
Increase dextrose concentration to 12.5%, 15% then 20%,
until normoglycaemia

UVC should be used if using IV dextrose > 12.5%

Repeat blood glucose every 30 mins after interventions until normal blood glucose (≥ 2.6 mmol/ℓ), then 2 hourly &/or before feeds until normal for two consequent readings

Gradually build up milk feeds over 2 – 4 days while decreasing IV fluids provided blood glucose remains normal at ≥ 2.6 mmol/ℓ.
Identify the cause and treat accordingly.

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Persistent Hypoglycaemia:

Low blood glucose/ IV dextrose to treat hypoglycaemia beyond first 48 hour

REFER AND DISCUSS: Calculate glucose administration rate (mg/kg/min) = ml/kg/24 hours x (% dextrose) x 0.007

Term glucose requirements: 4–6 mg/kg/min; Preterm requirements 6–8 mg/kg/min

Further investigations indicated if glucose requirement > 12 mg/kg/min or repeatedly unable to increase enteral feeds

Refer and discuss management with paediatrician/neonatologist/endocrinologist

CONSIDER AND TREAT SEPSIS

Take blood culture

Start broad spectrum antibiotics

For early or late onset sepsis

SCREEN FOR ABNORMAL INSULIN & CORTISOL

Draw **critical blood sample** when hypoglycaemic: for serum glucose, insulin and cortisol

Further investigations in discussion with referral hospital

NOTE: HYPERINSULINISM: High insulin despite hypoglycaemia

Commonest cause in infants of diabetic mothers, intra-uterine growth restriction, or intrapartum stress – usually resolves in few weeks

Medication with specialist guidance: Diazoxide 2–6 mg/kg/day IV/PO divided into 3 doses, 8 hourly, and Hydrochlorothiazide: 1–3 mg/kg/dose PO 6-12 hourly (potentiates the effect of diazoxide)

NOTE: LOW CORTISOL – usually transient/secondary: Discuss use of Hydrocortisone 1–2 mg/kg/dose IV/PO 6 hourly

Neonatal Hypoglycaemia: Referral, Discharge and Follow-up

Referral/Discussion

- Severe and persistent hypoglycaemia
- Medicated hypoglycaemia – eg glucagon
- Unknown cause for Hypoglycaemia
- Underlying condition merits referral to next highest level

Discharge criteria (relating to hypoglycaemia only)

- Two normal pre-prandial blood glucose levels consecutively on normal 3 hourly feeds.

Follow-up

- All babies with severe hypoglycaemia must have neurodevelopmental follow-up at 20 weeks cGA
- Consider brain MRI for signs of brain injury.
- Other follow-up dates will depend on aetiology.

Thank you for your attention.

Questions ?