

# POLYCYTHAEMIA

## RECOGNITION AND ASSESSMENT

### Definition

- Peripheral venous haematocrit (Hct) >65% or Hb >220 g/L
- Symptoms rarely occur with peripheral Hct of <70%
- Hct peaks at 2 hr after birth and then decreases with significant changes occurring by 6 hr

### Clinical consequences

- Hyperviscosity
- Decreased blood flow and impaired tissue perfusion
- Increased risk of thrombus formation

### Complications

- Cerebral micro-infarction and adverse neurodevelopmental outcome
- Renal vein thrombosis
- Necrotising enterocolitis (NEC)

### Causes

- Intra-uterine increased erythropoiesis
- placental insufficiency (SGA)
- postmaturity
- maternal diabetes
- maternal smoking
- chromosomal abnormalities: trisomy 21, 18, 13
- Beckwith–Wiedemann syndrome
- congenital adrenal hyperplasia
- neonatal thyrotoxicosis
- congenital hypothyroidism
- Erythrocyte transfusion
- maternal-fetal transfusion
- twin-to-twin transfusion
- delayed cord clamping
- unattended/uncontrolled or precipitous delivery

### Symptoms and signs

- Commonly plethoric but asymptomatic
- Cardiorespiratory
  - respiratory distress
  - tachycardia
  - persistent pulmonary hypertension of the newborn
  - congestive cardiac failure
- CNS
  - lethargy, hypotonia within 6 hr
  - difficult arousal, irritability
  - jittery
  - easily startled
  - seizures
- GIT
  - poor feeding
  - vomiting
  - NEC
- Metabolic
  - hypoglycaemia
  - hypocalcaemia
  - jaundice
- Haematological
  - thrombocytopenia

- Renal
- renal failure
- renal vein thrombosis

## INVESTIGATIONS

In all unwell babies and at-risk babies who look plethoric (as mentioned above)

- FBC/Hct
- If Hct >65%, repeat a free-flowing venous sample or obtain arterial Hct (capillary Hct sample unreliable)
- If polycythaemic, check blood glucose, serum calcium, serum bilirubin

## IMMEDIATE TREATMENT

- Decisions regarding treatment to be made on the basis of venous Hct
- Ensure babies at risk have liberal fluid intake 1 day ahead of usual requirement (see **Intravenous fluid therapy** guideline)

### **Asymptomatic babies with Hct >70%**

- Repeat venous Hct after 6 hr
- if still high, discuss with consultant

### **Symptomatic babies with Hct >65%**

- Possible symptoms: fits and excessive jitteriness, with neurological signs and refractory hypoglycaemia

### **Treatment**

- Dilutional/partial exchange transfusion. Discuss with consultant
- use of haemodilution for treatment of polycythaemia is not supported by evidence and treatment of asymptomatic babies is not recommended
- explain to parents the need for exchange transfusion and possible risks before performing partial exchange transfusion. Partial exchange transfusion increases risk of NEC
- use sodium chloride 0.9% (see **Exchange transfusion** guideline)
- Volume to be exchanged = 20 mL/kg
- Perform exchange via peripheral arterial and IV lines **or** via umbilical venous catheter
- Take 5–10 mL aliquots and complete procedure over 15–20 min

## SUBSEQUENT MANAGEMENT

- Babies who required partial exchange transfusion require long-term neurodevelopmental follow-up
- Otherwise, follow-up will be dependent on background problem