

BLOOD GROUP INCOMPATIBILITIES (including RHESUS DISEASE)

*Aim to avoid kernicterus and severe anaemia
Keep consultant in charge informed*

POSTNATAL MONITORING

Newborns at risk

- Those with mothers with known blood group antibodies including:
 - D (Rhesus), c, C, s, E, Duffy
 - Kell – causes bone marrow suppression in addition to haemolysis

Management of newborns at risk of haemolysis

- Antenatally: prepare a plan based on antibody levels, middle cerebral artery Dopplers and evidence of hydrops
- order blood in advance for exchange transfusion if anticipated
- Send cord blood **urgently** for Hb, blood group, direct Coombs' test (DCT) and bilirubin – chase results
- in all newborns who have had an in-utero blood transfusion (IUT), send cord blood also for a Kleihauer test
- If pale with abnormal cardiorespiratory signs (e.g. tachycardia), admit to NNU
- In babies with a positive DCT or had an IUT (regardless of DCT and blood group):
 - inform middle-grade doctor
 - check serum bilirubin at 4 hr of age
 - monitor serum bilirubin, usually at 4 hrly intervals but frequency depends on rate of rise
 - chart a graph of rate of rise
 - keep parents informed
 - discuss progress regularly with middle-grade doctor or consultant. Consider whether newborn needs phototherapy or exchange transfusion-see below
- In babies with no IUT and negative DCT, no further action required; the newborn is not affected

Management of newborns with haemolysis diagnosed or suspected postnatally

- Newborns with
 - blood group incompatibility with a positive DCT, manage as above
 - red cell enzyme defect, inform consultant on-call

PHOTOTHERAPY

Indications/treatment thresholds

*Prophylactic phototherapy (e.g. from birth) is not beneficial
Treatment thresholds are lower in haemolysis because bilirubin is more freely available*

- Term (≥ 37 weeks gestation) – serum bilirubin >240 micromol/L
- Preterm – serum bilirubin level $>[(17 \times \text{gestational age in weeks})/2] - 100$
 - e.g. at 33 weeks, start phototherapy if >180 micromol/L
- Inform middle-grade doctor when a baby requires phototherapy

Management

- Plot bilirubin values on a chart
- Check bilirubin 4 hr after the onset of phototherapy

- Monitor serum bilirubin at least 12 hrly, determining the frequency of measurement from the response at 4 hr
- Encourage mother to continue feeding using her chosen method, but emphasise need for adequate hydration
- Continue phototherapy until value falls consistently (e.g. two consecutive bilirubin values) below the phototherapy level on the chart
- Once phototherapy has been discontinued check serum bilirubin within 12 hr
- Communicate plan of management clearly to parents and document:
 - discuss any communication difficulties with on-call consultant

EXCHANGE TRANSFUSION

Indications– always discuss with consultant

Anaemia

- A newborn who has **not** had an in-utero blood transfusion with a cord Hb <12 g/dL needs an urgent exchange transfusion to remove antibodies and correct anaemia. Simple packed-cell blood transfusions should be avoided
- In a newborn who has had in-utero transfusions and the Kleihauer test demonstrates a predominance of adult Hb, anaemia can be managed using a top-up transfusion of irradiated, CMV-negative blood. This test may not be available in your hospital
- Irradiated blood has a shelf-life of 24 hr only

Hyperbilirubinaemia

- The levels at which a consultant would need to make a decision for exchange are:
 - term: serum bilirubin >340 micromol/L
 - preterm: serum bilirubin >(17 x gestational age in weeks)/2
 - predict possible need for an exchange transfusion if rate of rise of bilirubin is >10 micromol/L per hour despite phototherapy
 - cord bilirubin acts as reference to compare with 4 hr bilirubin. There is no current cord bilirubin concentration that would indicate immediate need for exchange transfusion

FOLLOW-UP AND TREATMENT OF LATE ANAEMIA

- All newborns with haemolytic anaemia need:
 - Hb check at 2 and 6 weeks
 - discuss results urgently with neonatal consultant
- Indication for top-up transfusion for late anaemia:
 - at request of neonatal consultant
 - symptomatic anaemia
 - Hb <7.5 g/dL
- Outpatient clinic at 3 months and hearing test for any infant:
 - with possible/definite red cell anomalies
 - who has undergone an exchange transfusion
 - who has had an in-utero transfusion
 - with serum bilirubin at or above exchange transfusion threshold