

# BLOOD GROUP INCOMPATIBILITIES

## Supporting information

**This guideline and supporting information has been produced with reference to the following:**

Anon. Transfusion guidelines for neonates and older children. *Br J Haematol* 2004;124:433–53

### **What is the best way of detecting foetal anaemia and hyperbilirubinaemia?**

The most accurate method of testing for foetal anaemia (sampling foetal blood, or cordocentesis) is also the most invasive, and thus is usually the endpoint in a stepwise sequence beginning with less sensitive but non-invasive methods such as measuring maternal serum antibody titres. Cordocentesis has replaced amniocentesis as the definitive test since further evaluation by foetal-blood sampling of a high amniotic-fluid  $\Delta OD_{450}$  (Sikkel, 2002) has been a requirement before intervention (Saade, 2000). More accurate non-invasive methods would avoid the risks associated with invasive methods, but more rigorous research is needed (Divakaran, 2001). In a study in 111 foetuses (Mari, 2000), measuring increased peak velocity (1.50 multiples of the median) of systolic blood flow in the middle cerebral artery by Doppler ultrasonography had a sensitivity of 100% for the prediction of moderate or severe anaemia., with a false positive rate of 12%. No larger-scale studies validating these findings have been identified (Oepkes, 2000).

Studies on foetal DNA present in maternal plasma now provide an accurate (99.5%) means of determining the RHD status of the foetus (Rijnders, 2004; Rouillac le Sciellour, 2004).

Divakaran TG, Waugh J, Clark TJ, et al. Noninvasive techniques to detect fetal anemia due to red blood cell alloimmunization: a systematic review. *Obstet Gynecol* 2001;98:509-17

Mari G. Noninvasive diagnosis by Doppler ultrasonography of fetal anemia due to maternal red-cell alloimmunization. *N Engl J Med* 2000;342:9-14

Oepkes D. Invasive versus non-invasive testing in red-cell alloimmunized pregnancies. *Eur J Obstet Gynecol Reprod Biol* 2000;92:83-9

Rijnders RJ, Christiaens GC, Bossers B, et al. Clinical applications of cell-free fetal DNA from maternal plasma. *Obstet Gynecol* 2004;103:157-64

Rouillac le Sciellour C, Puillandre P, Gillot R, et al. Large-scale pre-diagnosis study of fetal RHD genotyping by PCR on plasma DNA from RhD-negative pregnant women. *Mol Diagn* 2004;8:23-31

Saade GR. Noninvasive testing for fetal anemia. *N Engl J Med* 2000;342:52-3

Sikkel E, Vandenbussche FP, Oepkes D, et al. Amniotic fluid delta OD 450 values accurately predict severe fetal anemia in D-alloimmunization. *Obstet Gynecol* 2002;100:51-7

**Evidence Level: IV**

## **What are the indications for phototherapy?**

The trigger for commencement of phototherapy is the total serum bilirubin (TSB) level, but sliding scales based on age and risk level are guided by little evidence and the TSB levels given are approximations (Anon, 2004).

A study in 276 infants (Maurer, 1985) found that phototherapy had no therapeutic effect in reducing the need for exchange transfusion in those with a positive Coombs test for haemolytic disease, but a 9.4% absolute risk reduction in those with a negative Coombs test (NNT 11; 95% CI 10-12).

Anon. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. *Pediatrics* 2004;114:297-316

Maurer HM, Kirkpatrick BV, McWilliams NB, et al. Phototherapy for hyperbilirubinemia of haemolytic disease of the newborn. *Pediatrics* 1985;75:407-12

### **Evidence Level: IV**

## **What follow-up do these babies need, and for how long?**

Studies that have investigated developmental outcome between 18 months and 5 years after intrauterine transfusion (Janssens, 1997; Stewart, 1994) have found this to be satisfactory when compared to both normal controls and those babies considered to be “high-risk” but who did not undergo transfusion.

No specific guidance on timing or follow-up for babies with RHD can be identified.

Janssens HM, de Haan MJ, van Kamp IL, et al. Outcome for children treated with fetal intravascular transfusions because of severe blood group antagonism. *J Pediatr* 1997;131:373-80

Stewart G, Day RE, Del Priore C, et al. Developmental outcome after intravascular intrauterine transfusion for rhesus haemolytic disease. *Arch Dis Child Feat Neonatal Ed* 1994;70:F52-F53

### **Evidence Level: V**

**Last amended September 2007**