

Optimising blood volume at birth in preterm infants

The effect of the timing of cord clamping on blood volume in preterm infants is discussed in two papers a letter and an accompanying perspective in this issue. After at least 10 small randomised controlled trials the short-term haemodynamic effects of delayed cord clamping are established, but it has not become routine practice. The wording suggests that the delay is an intervention when of course it is the early clamping that is the intervention that requires justification. Concerns about the need for immediate resuscitation/stabilisation have excluded some of the more vulnerable infants from study. There is a paucity of data describing the most immature infants and a lack of long-term follow up to establish any permanent benefits. Reynolds calls for a large definitive trial which focuses on longer-term outcome. Delayed clamping would certainly have the potential to affect the outcomes of a lot of infants worldwide at virtually no cost if proven to influence long-term outcome. The study of cord milking by Hosoni *et al* offers the possibility of enhanced blood volume even when resuscitation is considered so urgent as to make caregivers unwilling to delay cord clamping. **See pages F2, F14 and F77**

Echocardiographic assessment of systemic blood flow

Although we measure blood pressure in sick infants and treat low blood pressure on the assumption that this will improve organ blood flow and clinical outcome, the relationship between blood pressure and flow is complex. Increased resistance to flow can result in low flow even in the presence of high pressure. As Groves *et al* point out, we readily accept this as

common sense when applied to the pulmonary circulation in the case of persistent pulmonary hypertension of the newborn but pay less attention to the distinction in the case of the systemic circulation. Systemic blood flow, as measured by flow in the superior vena cava, has been proposed as an alternative measure to blood pressure in the assessment of the systemic circulatory state. Two studies by Groves *et al* provide useful information for those attempting to make use of these measurements in the clinical setting. In the first study they measured the repeatability of measurements of SVC flow made on the same babies within and between observers. Repeated measurements by a single observer showed similar reproducibility to other haemodynamic assessments made using ultrasound, but the difference between measurements obtained by two observers was too large for reliable interpretation. In their second study the same authors made four measurements of arterial blood pressure and systemic blood flow in the first 48 hours of life in a population of preterm infants who had invasive arterial blood pressure monitoring. There was no evidence of a positive relationship between blood pressure and systemic blood flow throughout the 48 hours. In the first few hours of life, the relationship between blood pressure and blood flow was weakly but significantly inverse. **See pages F24 and F29**

Volume targeted ventilation

Increasingly, neonatal ventilators offer the option of incorporating volume measurements into the control of ventilation. There are substantial differences between devices in how this is achieved and this means that the approaches should not be used interchangeably. The concept is based on sound evidence regarding mechanisms of ventilator induced lung

injury and is supported by small clinical studies. In this issue McCallion *et al* demonstrate that in a group of preterm infants the use of volume guarantee was associated with a 4cm H₂O reduction in peak inflation pressure during triggered inflations. Grover and Field provide an overview of the published evidence describing volume targeted ventilation and, whilst cautiously enthusiastic, they remind us that similar enthusiasm followed the introduction of triggered modes and high frequency oscillation and yet larger trials have not demonstrated improvements in mortality, chronic lung disease or neurodevelopmental outcome with those therapies. To inform practice a large multicentre trial that demonstrates whether the promise of these smaller studies from single centres can be reproduced more widely is required. **See pages F7 and F36**

Timing of diagnosis of life potentially life-threatening congenital heart disease

Wren and colleagues reviewed data from the Northern Regional Cardiology Database over a 20-year period 1985–2004. This includes information on all liveborn infants who are diagnosed as having cardiovascular malformation and covers a region with 35 000 births per year. Potentially life-threatening lesions were identified in 669 infants. Diagnosis was made in living infants after discharge from hospital in 25% of cases and after death in 5%. The proportion of cases going home undiagnosed remained around 25% over time. The most likely malformations to remain undiagnosed at discharge were coarctation of the aorta, interruption of the aortic arch, aortic valve stenosis and total anomalous venous connection. **See page F33**