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Highlights from this issue

Ben Stenson, *Edition Editor*

STUDIES OF FETAL TO NEONATAL TRANSITION

Interventions during transition may be completed before the infant reaches the neonatal unit but they have the potential to influence the rest of the infant's life. We publish three articles in this subject area. The editor's choice is the review article by Stuart Hooper and colleagues which summarises advances in knowledge regarding the physiological effects of umbilical cord clamping at birth. It is already widely recommended that there should be a period of delay after delivery before the umbilical cord is clamped and it is well recognised that this provides additional blood volume that impacts on later haemodynamic stability and the risk of anaemia. This article focuses on the startling haemodynamic disturbances that result from completely obstructing the placental circulation before an infant has started to breathe. The effect is to cause marked swings in cardiac output, blood pressure and oxygenation that are largely avoided when cord clamping is delayed until after breathing is established. It is really worth going through this article carefully to gain understanding of the physiological changes that have been demonstrated in controlled animal studies. The importance of outcome studies in human preterm infants of stabilisation after birth with an intact placental circulation cannot be understated.

In a study from the same group, Sobotka and colleagues examined the effect of different inspired oxygen percentages during initial lung aeration on heart rate and pulmonary blood flow in asphyxiated preterm lambs. Initial lung recruitment with air or with 100% oxygen brought about more rapid improvements in heart rate and pulmonary blood flow than recruitment with nitrogen or with 5% oxygen in nitrogen. There was no advantage to 100% oxygen compared with air. It appeared that in this asphyxiated model the oxygen was required to enable the myocardial function to improve and drive the other changes then brought about by lung expansion.

Smolzer and colleagues performed a meta-analysis of studies of sustained inflations for initial lung aeration in preterm infants. Four trials enrolling 611 infants were identified which employed sustained inflations varying from 5 to 15 seconds in duration. When compared with infants

stabilised with IPPV, 10% fewer infants who received sustained inflations required mechanical ventilation in the first 72 hours after birth. There were no significant differences in death or in BPD, or in a composite of the two outcomes. Although not statistically significant, intraventricular haemorrhage and treatment for patent ductus arteriosus occurred more frequently after sustained inflations. The authors report that there are at least three further randomised controlled studies in progress and suggest that further data are required to establish the safety and efficacy of sustained inflations before they should be used outside the confines of randomised controlled trials. *See pages 355, 337 and 361*

THE ROLE OF MRI IN PRETERM INFANTS

Plaiser and colleagues investigated serial cranial ultrasound and MRI scans in the evaluation of preterm brain injury in 307 preterm infants who were born before 28 weeks of gestation. All the infants got serial ultrasound scans but early MRI scans commonly had to be postponed or cancelled due to clinical instability. There were 180 infants scanned by both techniques. Serial ultrasound scans detected most abnormalities and were less often cancelled due to other clinical priorities. MRI was better at detecting germinal matrix injuries and cerebellar haemorrhages. Ultrasound was better for intraventricular haemorrhage, perforator stroke and cerebral venous sinus thrombosis.

Parodi and colleagues looked at the ability of ultrasound scan to detect cerebellar haemorrhages that were visible on MR scanning. Using views through the anterior and mastoid fontanelles, ultrasound detected larger cerebellar lesions well but not smaller ones.

Linda De Vries has reviewed both papers in the context of existing evidence and in relation to the questions whether and when all preterm infants should have a routine MRI. These studies add to the jigsaw but it is still incomplete. Although the potential value of MRI is clear more information is required correlating MRI findings with longer term outcome to establish the value of MRI as a routine investigation and to resolve the significance of small cerebellar haemorrhages in terms of prognosis. *See pages 284, 293 and 289*

INGUINAL HERNIA

Inguinal hernias affect as many as 15% of preterm infants and because these infants have co-morbidities surgery has a different risk profile than hernia surgery in older children. Eileen Duggan and colleagues review the subject highlighting the many uncertainties in the evidence over the optimal treatment. Many preterm infants are ventilator dependent post-operatively or have significant apnoeic episodes. This can be diminished with later surgery but the risk of incarceration and associated gonadal atrophy is quite high.

Hernia recurrence appears more common in preterm infants. Emerging data about potential adverse effects of general anaesthesia in young infants are additional cause for concern. There are more questions than answers over the optimal timing of repair. Happily a large multicentre RCT of the timing of surgery is under way. Repair before NICU discharge will be compared with repair at 55-60 weeks post-menstrual age in a population of 600 infants. *See page 286*

NEUROLOGICAL OUTCOMES AFTER LATE AND MODERATE PREMATURITY

Samantha Johnson and colleagues compared the neurodevelopmental outcomes at 2 years corrected age of 638 preterm infants born between 32⁺⁰ and 36⁺⁶ weeks gestation with those of 765 term born controls using the Parent Report of Children's Abilities-Revised (PARCA-R). The late and moderately preterm infants were at double the risk of neurodevelopmental impairment. Although the absolute risks were relatively low the very large numbers of these infants in comparison with the number of infants born at earlier gestations mean that the outcomes of these relatively mature premies have significant public health implications. *See page 301*

EARLY ONSET NEONATAL SEPSIS: DIAGNOSTIC DILEMMAS AND PRACTICAL MANAGEMENT

Alison Bedford Russell provides an up to date summary of current developments in the diagnosis and management of early onset neonatal sepsis and highlights the increasing importance of antibiotic stewardship. *See page 350*