Highlights from this issue

Ben J Stenson, *Edition Editor*

IMAGING THE ENCEPHALOPATHY OF PREMATURITY

Julia Kline and colleagues assessed MRI findings at term in 110 preterm infants born before 32 weeks' gestation and cared for in four neonatal units in Columbus, Ohio. Using automated cortical and sub-cortical segmentation they analysed cortical surface area, sulcal depth, gyrification index, inner cortical curvature and thickness. These measures of brain development and maturation were related to the outcomes of cognitive and language testing undertaken at 2 years corrected age using the Bayley-III. Increased surface area in nearly every brain region was positively correlated with Bayley-III cognitive and language scores. Increased inner cortical curvature was negatively correlated with both outcomes. Gyrification index and sulcal depth did not follow consistent trends. These metrics retained their significance after sex, gestational age, socio-economic status and global injury score on structural MRI were included in the analysis. Surface area and inner cortical curvature explained approximately one-third of the variance in Bayley-III scores.

In an accompanying editorial, David Edwards characterises the complexity of imaging and interpreting the combined effects of injury and dysmaturation on the developing brain. Major structural lesions are present in a minority of infants and the problems observed in later childhood require a much broader understanding of the effects of prematurity on brain development. Presently these more sophisticated image-analysis techniques provide insights at a population level but the variation between individuals is such that they are not sufficiently predictive at an individual patient level to be of practical use to parents or clinicians in prognostication. Studies like this highlight the importance of follow-up programmes and help clinicians to avoid falling into the trap of equating normal (no major structural lesion) imaging studies with normal long term outcomes. *See pages F460 and F458*

DRIFT AT 10 YEARS

Karen Luuyt and colleagues report the cognitive outcomes at 10 years of the DRIFT (drainage, irrigation and fibrinolytic therapy) randomised controlled trial of treatment for post haemorrhagic ventricular dilatation. They are to be congratulated for continuing to track these children and confirming the persistence of the cognitive advantage of the treatment that was apparent from earlier follow-up. Infants who received DRIFT were almost twice as likely to survive without severe cognitive disability than those who received standard treatment. While the confidence intervals were wide, the point estimate suggests that the number needed to treat for DRIFT to prevent one death or one case of severe cognitive disability was 3. The original trial took place between 2003 and 2006 and was stopped early because of concerns about secondary intraventricular haemorrhage and it was only on follow-up that the advantages of the treatment became apparent. The study shows that secondary brain injury can be reduced by washing away the harmful debris of IVH. No other treatment for post-haemorrhagic ventricular dilatation has been shown to be beneficial in a randomised controlled trial. Less invasive approaches to CSF drainage at different thresholds of ventricular enlargement later in the clinical course have not been associated with similar advantage. However the DRIFT treatment is complex and invasive and could only be provided in a small number of specialist referral centres and logistical challenges will need to be overcome to evaluate the treatment approach further. *See page F466*

CHEST COMPRESSIONS

With a stable infant in the neonatal unit, it is common to review the events of the initial stabilisation and to speculate on whether chest compressions were truly needed to establish an effective circulation, or whether their use reflected clinician uncertainty in the face of other challenges. Anne Marthe Boldinge and colleagues provide some objective data on the subject. They analysed videos that were recorded during neonatal stabilisation in a single centre with 5000 births per annum. From a birth population of almost 1200 infants there were good quality video recordings from 327 episodes of initial stabilisation where positive pressure ventilation was provided and 29 of these episodes included the provision of chest compressions, mostly in term infants. 6/29 of the infants who received chest compressions were retrospectively judged to have needed them. 8/29 had adequate spontaneous respiration. 18/29 received ineffective positive pressure ventilation prior to chest compressions. 5/29 had a heart rate greater than 60 beats per minute at the time of chest compressions. A consistent pattern of ventilation corrective actions was not identified. One infant received chest compressions without prior heart rate assessment. *See page 545*

PROPOFOL FOR NEONATAL ENDOTRACHEAL INTUBATION

Most clinicians provide sedation/analgesia for neonatal intubations but there is still a lot of uncertainty about the best approach. Ellen de Kort and colleagues set out to identify the dose of propofol that would provide adequate sedation for neonatal intubation without side-effects. They conducted a dose-finding trial which evaluated a range of doses in infants of different gestations. They ended their study after 91 infants because they only achieved adequate sedation without side effects in 13% of patients. Hypotension (mean blood pressure below post-mentrual age in the hour after treatment) was observed in 59% of patients. *See page 489*

GROWTH TO EARLY ADULTHOOD FOLLOWING EXTREMELY PRETERM BIRTH

The EPICure cohort comprised all babies born at 25 completed weeks of gestation or less in all 276 maternity units in the UK and Ireland from March to December 1995. Growth data into adulthood are sparse for such immature infants. Yanyan Ni and colleagues report the growth to 19 years of 129 of the cohort in comparison with contemporary term born controls. The extremely preterm infants were on average 4.0 cm shorter and 6.8 kg lighter with a 1.5 cm smaller head circumference relative to controls at 19 years. Body mass index was significantly elevated to +0.32 SD. With practice changing to include the provision of life sustaining treatment to greater numbers of infants born at 22 and 23 weeks of gestation there is a strong case for further cohort studies to include this population of infants. *See page F496*

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