Highlights from this issue

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PHYSIOLOGICAL STUDIES OF TRANSITION

There are two thought provoking physiological studies from the group in Melbourne, Australia, led by Stuart Hooper. Both concern the physiology of transition in relation to whether or not the umbilical cord is clamped. In the first study, Aidan Kashyap *et al* studied physiologically based cord clamping in lambs with congenital diaphragmatic hernia. Compared with lambs in which the cord was clamped before the onset of ventilation, lambs who were ventilated with their cord intact had dramatically greater pulmonary blood flow and cerebral oxygenation. Pulmonary vascular resistance in lambs with physiologically based cord clamping was 3-fold lower 2 hours later, suggesting the potential to influence the natural history of pulmonary hypertension after transition. If these findings are replicated in human infants this approach could bring about a huge shift in the management of this condition. In the second study, Emma Brouwer *et al* measured umbilical blood flow in spontaneously breathing lambs with intact umbilical cords. Flow varied with respiration and, contrary to their prior hypothesis, it decreased during inspiration and increased during expiration. Vigorous inspiration caused flow to cease altogether and they consider these observations likely to reflect compression of the inferior vena cava by diaphragmatic contraction during inspiration. Forced expiration caused flow reversal and net flow out of the lamb. This could be a further stabilising factor in the haemodynamics of transition with the cord intact that contributes to reduced risk of intraventricular haemorrhage in preterm infants. ***See pages F26 and F18***

ETHICS, MINIMAL HARM AND NON-THERAPEUTIC RESEARCH IN NEWBORNS

Parents of babies who were enrolled in the Glucose in Well Babies (GLOW) study gave consent for their healthy term babies to have an intradermal glucose sensor placed and for there to be up to 14 heelprick blood samples taken for measurements of glucose, lactate and beta-hydroxybutyrate during the first 5 days after birth. The study will give rise to valuable information about transition that could not be obtained in any other way. Alana Cumberpatch *et al* studied the parental perspectives of participating in the study. They enrolled 70 babies of whom 67 completed the study protocol. Three babies who became unwell were withdrawn. 66 mothers and 65 fathers provided feedback. More than 96% would participate again and 100% would recommend participation to family and friends. This is important information for clinicians and ethics committees evaluating future studies in newborn infants where consideration must be given to the acceptable boundaries of minimally invasive research procedures. Dominic Wilkinson has written a viewpoint on the ethical issues. ***See pages F4 and F2***

SCHOOL-AGE OUTCOMES AFTER COOLING FOR HIE

Richard Lee-Kelland *et al* conducted a prospective case control study to evaluate the school-age outcomes of a group of children who were treated with therapeutic hypothermia for hypoxic ischaemic encephalopathy (HIE) in 2008–10 and who were free from cerebral palsy on follow-up. 29 case children were matched for age, sex and social class to control infants. Cognitive, behavioural and motor outcomes were assessed at 6 to 8 years. The children who underwent therapeutic hypothermia had significantly lower cognitive scores, on average 14 IQ points lower than matched peers. Motor scores were lower, particularly affecting manual dexterity skills. Behavioural scores were lower and there was a 10-fold increased odds of requiring additional support at school. The lower cognitive abilities reported in this study are consistent with the findings of prior studies in non-cooled children with HIE, indicating that this effect is still present despite the use of therapeutic hypothermia, and support the argument that follow-up should go beyond the early years. ***See page F8***

OUTCOME OF RESUSCITATION FROM 10-MINUTE APGAR OF ZERO

Reports published in this journal in recent years have shown that outcome is not universally poor in newborn infants whose Apgar score remains zero at 10 min. Jun Shibasaki *et al* report outcomes of infants in the Baby Cooling Registry of Japan who were treated with hypothermia after having Apgar scores at 10 min of zero. There were 28 infants born between 2012 and 2016. Nine (32%) infants died, 16 survived with severe disability and 3 survived with favourable outcome. There were 2 deaths that followed withdrawal of life sustaining treatment. The remaining deaths occurred despite provision of ongoing intensive care. The duration of resuscitation was extremely prolonged in some cases, with the first heart beat being detected after 20 min in 14 cases and after 30 min in eight infants. All of these infants died or had an unfavourable outcome, as did all infants whose heart rate remained below 100 beats per minute at 30 min. The 3 infants with favourable outcome had their first heart beat by 20 min. This report is useful because the commitment to life sustaining treatment was very strong. Consequently, mortality was lower than in other reports, but rates of severe disability were higher. Favourable outcomes are very unlikely when the heart beat has not returned after 20 min. ***See page F64***

ETHNIC DIFFERENCES IN SUSCEPTIBILITY TO OUTCOMES RELATED TO IMMATURITY

Two papers report variation in outcome in relation to ethnicity. Annie Cox *et al* examined outcomes of moderate-late preterm infants (32 to 36 weeks gestation) born at Monash Women's Services in Australia in 2012–2015. Among 14 262 singleton births to Australian or New Zealand born women and 7756 to South Asian-born women, babies born to South Asian-born mothers experienced significantly less hyaline membrane disease (7.8% vs 18%), required less resuscitation at birth (28.6% vs 42.2%) and were less likely to require ventilation (20% vs 34.6%). In the UK, Mary Kroll *et al* analysed 256 142 births in England and Wales from 2006 to 12. Among 24 to 27 week gestation births, all minority ethnic groups had lower risk of immaturity related death than white British. Among 32 to 36 week births all minority ethnic groups had higher rates of death due to congenital abnormality. ***See pages F50 and F56***