



# Highlights from this issue

Ben J Stenson, *Edition Editor*

## OPTIMISING THERAPEUTIC HYPOTHERMIA

Using the National Neonatal Research Database, Lara Shipley and colleagues studied infants  $\geq 36$  weeks gestation who were admitted to UK neonatal units with moderate or severe hypoxic ischaemic encephalopathy (HIE). Between 2011 and 2016 there were 5059 infants. Birth in a centre which provided servo controlled therapeutic hypothermia (a cooling centre) vs a non-cooling centre was associated with increased survival to discharge without seizures (35.1% vs 31.8%; OR 1.15, 95% CI 1.02 to 1.31;  $p=0.02$ ). Fewer infants born in cooling centres were diagnosed with seizures (60.7% vs 64.6%). Survival was similar. There were 2364 infants who were born in a non-cooling centre. Non-cooling centres would initiate passive cooling pending transfer of the infant to a cooling centre. Amongst the 2027 of these infants with a recorded admission temperature at the time of arrival at the cooling centre, 259 (12.7%) had a temperature in the recommended therapeutic range before 6 hours of age. There were a further 48.3% who arrived at the cooling centre between 6 and 12 hours of age with a temperature in the recommended range. The authors conclude that almost half of all infants with a diagnosis of moderate or severe HIE are born in non-cooling centres and the disparity of access to immediate therapeutic hypothermia could impact on outcomes. They encourage further equipping, training and support of non-cooling centres to minimise delays in optimal treatment. In an accompanying editorial, Topun Austin and Ela Chakkarapani review the evidence that, within the therapeutic window, earlier treatment is likely to be more effective. They encourage wider implementation and support of active cooling prior to transport. They point out that although there were fewer seizures in the infants born in cooling centres, this may be in part explained by greater access to aEEG monitoring in cooling centres, so this cannot be considered a reliable proxy for adverse neurological outcome.

In a separate editorial, Seetha Shankaran and colleagues discuss the evidence that late hypothermia treatment may still be of some benefit depending on the interpretation of the results of the NICHD NRN late hypothermia trial. They also discuss the article by Mohamed Ali Tagin and Alastair Gunn that appeared in the September issue of the journal.<sup>1</sup> Tagin and Gunn had encouraged clinicians who are uncertain about whether an infant meets cooling criteria to choose

cooling because they consider the potential benefits to outweigh the potential harms. Shankaran and colleague discuss potential downsides to this therapeutic creep (cooling for the wrong diagnosis, overtreatment, iatrogenic problems from a therapy not needed) and they stress the importance of completing ongoing studies of treatment in infants with mild encephalopathy and of treatment of preterm infants. *See pages F6, F2 and F4*

## LIFE THREATENING BPD

Rebecca Naples and colleagues report a prospective national study conducted through the British Paediatric Surveillance Unit of Infants with life threatening BPD. This was defined as a requirement for positive pressure respiratory support or pulmonary vasodilators at 38 weeks corrected gestational age after birth before 32 weeks gestation. From June 2017 to July 2018 153 infants were reported from the UK and Ireland, giving a minimum incidence of 13.9 per 1000 infants born before 32 weeks. From this statistic, level three neonatal units in the UK and Ireland will see around one such infant per year. The statistic does not include the infants with severe BPD who have already died by 38 weeks so it will underestimate the mortality from severe BPD. It is easy to be tempted into pessimism about the outcomes of infants with such severe BPD, but the results of this study give grounds for a more positive outlook. By 1 year of age 16% of the infants had died, so survival was the usual outcome. Discharge home was achieved by 81%, mostly on low flow oxygen – 9% required long term ventilation. Median age at discharge was 143 days. Post-discharge, two infants required new invasive ventilation, one required CPAP and eight required high flow during readmissions in the first year of life. Major concern about neurodevelopmental impairment was present at 1 year in around 1 out of 5 surviving infants. *See page F13*

## AUTOMATED CONTROL OF FIO<sub>2</sub>

Numerous systems have now been reported for delivering automated control of FIO<sub>2</sub> to newborn infants on ventilation and non-invasive respiratory support. All have shown that automated control results in more time intended target range. It remains to be shown that their use improves clinical outcomes. This will require large trials and for these to be interpretable we will need to know whether the different devices result in similar

or different achieved oxygen saturation profiles for a given target, as it may be inappropriate to consider the devices to be interchangeable. Hylke Salverda and colleagues performed a cross-over study comparing two different devices that are in current use and showed potentially important differences in performance, with one device achieving more time in target range than the other. One device resulted in more time with lower than intended SpO<sub>2</sub> and the other in more time with higher than intended SpO<sub>2</sub>. *See page F20*

## SPONTANEOUS BREATHING DURING DELAYED CORD CLAMPING

Here are some more data on the haemodynamics of transition with the cord intact. Emma Brouwer and colleagues performed continuous ultrasound recordings of blood flow during transition in 15 term born infants with delayed cord clamping. They found that during inspiration the inferior vena cava collapsed and blood flow into the foetus from the placenta increased, suggesting that inspiration may be an important driver of net placental transfusion. *See page F65*

## HFNC VERSUS CPAP FOR PRIMARY SUPPORT IN PRETERM INFANTS

Shaam Bruet and colleagues performed a systematic review and meta-analysis of studies comparing nasal CPAP with high flow nasal cannula (HFNC) as primary treatment for preterm infants. They included 10 studies that enrolled 1830 patients. Treatment failure, as defined by the authors of the individual studies, was more common with HFNC than with CPAP (RR=1.34, 95% CI 1.01 to 1.68, I<sup>2</sup>=16.2%), but there was not a significant difference in the number of patients who required intubation. Nasal trauma was less common with HFNC (RR=0.48, 95% CI 0.31 to 0.65, I<sup>2</sup>=0.0%). Protocols of six studies allowed cross over to CPAP in infants on HFNC meeting failure criteria, meaning that infants crossed over to CPAP and were not intubated. Individual morbidities were not significantly different. The authors of the review prefer initial treatment with HFNC to avoid nasal trauma, with cross over to CPAP if required. The data are not strong enough to give rise to a clear recommendation for all. *See page F56*

## REFERENCE

- 1 Tagin MA, Gunn AJ. Neonatal encephalopathy and potential lost opportunities: when the story fits, please cool. *Arch Dis Child Fetal Neonatal Ed* 2021;106:458–9.