Abstract 6.5 Statistically significant associations from the logistic regression analysis for the outcome livebirth with HR >100/5 min

Item	OR (95% CI)	p Value
PPROM	0.74 (0.55 to 0.99)	0.04
Abruption	0.43 (0.27 to 0.68)	<0.001
Any antenatal steroid	2.09 (1.51 to 2.89)	<0.001
GA per week	1.96 (1.77 to 2.22)	<0.001
Birthweight for GA per 100 g	1.44 (1.26 to 1.64)	<0.001
Cephalic presentation	2.36 (1.80 to 3.09)	<0.001
Vaginal delivery	0.58 (0.39 to 0.86)	0.01
Presence of any paediatric staff	2.64 (1.92 to 3.63)	<0.001

GA, gestational age; HR >100/5 min, heart rate >100 bpm 5 minutes after birth; OR, odds ratio; PPROM, prolonged pre-labour rupture of membranes.

for extremely preterm livebirths in the national datasets collected for the EPICure studies in both 1995 and 2006.
Objective: To identify predictors of favourable neonatal outcome (HR >100/5 min) following extremely preterm birth.
Methods: An extensive dataset of maternal demographic, obstetric and neonatal factors was collected for all births 22 + 0 to 26 + 6 weeks in all English hospitals in 2006. Gestational age was validated using a hierarchical classification of scan dates, certain last menstrual period and working gestation.
Results: Data were collected for 1590 singleton births either born by Caesarean section or alive at the onset of labour of whom 1049 (66%) were liveborn with HR >100/5 (see table).
Conclusions: The only intervention highly associated with a favourable outcome for extremely preterm babies is the administration of antenatal steroids. Babies with placental abruption were much less likely to have HR >100/5 min. The incorporation of this information into clinical decision making remains a challenge for both obstetricians and neonatalogists.

Session 6B BAPM/NNS: Lungs and Infection

6.6 A RANDOMISED COMPARISON OF WIDE VERSUS NARROW SATURATION MONITOR ALARM LIMITS FOR CONTROLLING OXYGEN THERAPY IN PRETERM INFANTS

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Background: Saturation monitoring is used widely to guide oxygen therapy. The optimal target ranges are unknown. There is a general aim to minimise hyperoxia, hypoxia and variability. Chosen alarm limits may influence stability because alarm soundings prompt alterations to oxygen therapy.
Aim: To determine whether the width of the alarm limits influences the stability of oxygenation in oxygen-dependent preterm infants.
Methods: Infants born at <29 weeks' gestation and receiving supplemental oxygen were studied between days 3 and 14. Each infant was studied for two consecutive 3-h periods allocated in random order. During one period the alarm limits were set at 80–94% and during the other at 86–94%. Saturation values were downloaded to a PC every second. For each period the percentage of time spent with saturation >94%, <86%, <80% and saturation variability (standard deviation) were calculated. Differences within babies between the two periods were analyzed by by Wilcoxon test.
Results: See table.
Conclusions: When wider saturation alarm limits were used, babies spent less time with high saturations but no more time with low saturations. These results will facilitate improved oxygen saturation targeting.

Abstract 6.6

	Wide (80–94%)	Narrow (86–94%)	Median difference
Mean Spo_2 (%)	89.3 (88.1 to 90.5)	89.0 (88.6 to 91.8)	0 (−1.9 to 1.7)
% Time Spo_2 >94%	8.8 (5.3 to 20.4)	12.9 (6.3 to 31.0)	3.8 (−0.9 to 10.2)*
% Time Spo_2 <86%	16.0 (5.8 to 24.7)	14.4 (9.1 to 24.3)	0 (−8.4 to 6.9)
% Time Spo_2 <80%	3.8 (0.5 to 7.9)	4.2 (2.0 to 11.8)	0.5 (−1.0 to 6.2)
Spo_2 variability	5.0 (3.3 to 7.3)	6.2 (4.2 to 10.7)	0.7 (−0.4 to 3.8)*

Spo_2, oxygen saturation.
Data are median (interquartile range). *p<0.05.

6.7 COMPARISON OF LEFT AND RIGHT VENTRICULAR FUNCTION IN TERM AND PRETERM NEONATES USING TISSUE DOPPLER IMAGING

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Background: Tissue Doppler imaging (TDI) enables the measurement of myocardial velocities and calculation of the myocardial performance index.[12] Preterm infants are at risk of cardiac dysfunction but the aetiology and most effective treatments are not clear. This is the first study comparing TDI data from preterm and term neonates.
Methods: 30 neonates (25–41 weeks' gestation) were scanned by a single investigator (RN) on day one of life. TDI waveforms were acquired from an apical four-chamber view using a Doppler pulse-wave sample gate at the lateral tricuspid (right ventricular) and mitral (left ventricular) annuli. Peak systolic, early diastolic and late diastolic velocities were measured. Pulse-wave Doppler data of tricuspid, mitral and left ventricular outflow were obtained from an apical view. Right ventricular outflow was assessed from a parasternal view. Average readings were taken from three to five cardiac cycles. South Birmingham REC gave ethical approval.
Results: Patient data were compared from three gestational groups (n = 10 in each). Myocardial velocities decreased and the derived myocardial performance index increased with decreasing gestation (see table).
Conclusions: TDI enables the quantification of neonatal myocardial function. Velocities from term babies are consistent with published data[13] and this study provides evidence of relative myocardial dysfunction in preterm infants.

1. **Mori K,** *et al*. *Heart* 2004;**90**:175–80.
2. **Roberson DA,** Cui W. *J Am Soc Echocardiogr* 2006;**19**:1438–45.
3. **Ekici, *et al***. *Echocardiography* 2007;**24**:61–7.

Abstract 6.7

	Tricuspid annulus velocity (mean, SD) (cm/s)			Mitral annulus velocity (mean, SD) (cm/s		
	S	E	A	S	E	A
Term	6.7 (1.2)	7.2 (1.2)	7.9 (1.7)	5.0 (1.2)	6.2 (1.0)	7.6 (2.5)
32–36 weeks	6.0 (0.9)	6.2 (0.9)	7.9 (1.6)	4.4 (0.7)	5.8 (1.6)	6.2 (2.1)
<30 weeks	4.8 (0.6)	4.0 (1.1)	7.4 (1.6)	3.7 (0.6)	4.3 (0.8)	5.4 (2.5)

6.8 LOW CORD BLOOD MONOCYTES MHC CLASS II EXPRESSION IS ASSOCIATED WITH SEPSIS IN TERM AND PRETERM NEONATES

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Hypothesis: MHC class II expression on monocytes is necessary for immune competence and can be downregulated after an inflammatory stimulus. We hypothesised that MHC class II expression would be decreased in preterm neonates and that low expression would increase the risk of subsequent sepsis.

Abstract 6.8

Patient groups	N	GA (median days)	Median monocyte MHC class II expression % (IQR)
Term labour	33	282	93.9 (84.8 to 97.5)
Term elective Caesarean section	25	272	92.9 (86.8 to 96.7)
Fetocide	20	164	82.7 (75.6 to 89.4)
IUGR	13	201	86.7 (86.3 to 89.6)
PTL	42	186	80.8 (67 to 81.8)* ***
PPROM	48	191	64.6 (39.5 to 72.2)** ***

GA, gestational age; IQR, interquartile range; IUGR, intrauterine growth restriction; PPROM, prolonged pre-labour rupture of membranes; PTL, preterm labour.
*p<0.05, **p<0.005 compared with fetocide, ***p<0.001 compared with term controls.

Methods: Umbilical cord blood was collected from 181 fetuses born: (1) at term after labour or elective delivery; (2) at <32 weeks following preterm labour (PTL) and/or prolonged pre-labour rupture of membranes (PPROM); (3) fetal blood taken before feticides for major anomalies. Inflammatory status was determined from monocyte MHC class II expression, measured using flow cytometry; whole blood was stimulated with *Escherichia coli* lipopolysaccharide and cytokine production quantified at 24 h. Placental histology, neonatal sepsis, morbidity and mortality were recorded.
Results: Monocyte MHC class II expression was lower in all preterm fetuses compared with term controls ($p<0.001$). Furthermore, MHC class II expression was lower in neonates born after PTL or PPROM ($p = 0.05$, $p = 0.002$, respectively) than fetocide and also in PTL/PPROM with chorioamnionitis ($p = 0.0001$) (see table). In the term control groups seven neonates admitted for investigation of sepsis had significantly reduced class II expression (non-sepsis versus sepsis, median percentage 93.4 (97.4–86.1) versus 41.6 (59.7–38.9) $p = 0.0001$). The septic neonates in the preterm group (PTL and PPROM) also showed significantly low class II expression on cord monocytes (non-septic versus septic preterm neonates, 69 (80.9–46.8) and 49.2 (62.2–30.1), respectively ($p = 0.009$). Lipopolysaccharide stimulation of whole blood from PTL/PPROM groups resulted in significantly lower levels of TNF-α (median and range 265.9 pg/ml (82–389) and IL-6 3493 pg/ml (2423–7893) than term controls (TNF-α 698 pg/ml (279–2633), IL-6 50 000 pg/ml (10 000–66 006) $p<0.05$) for both fetocide and term). TNF-α production was further reduced in preterm samples when the neonates became septic (41.3 pg/ml (31–127)) compared with gestational matched controls (265.9 pg/ml (82–389) $p<0.05$).
Conclusions: Monocyte MHC class II expression was lower in premature compared with term neonates and was particularly low after PTL or PPROM (compared with fetocide samples) or exposure to chorioamnionitis. As the MHC class II molecule is important in antigen presentation by monocytes, these low levels of expression may partly explain the immaturity of the neonatal immune system and its susceptibility to infection. In addition, endotoxin hyporesponsiveness in preterm neonates with sepsis suggests immunoparalysis. Reduced expression of monocyte MHC class II and endotoxin tolerance could make the neonate more vulnerable to sepsis.

6.9 UREAPLASMA SPP. OR BACTERIAL COLONISATION ARE ASSOCIATED WITH THE DEVELOPMENT OF CHRONIC LUNG DISEASE OF PREMATURITY

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Antenatal and postnatal infections have been linked to the development of chronic lung disease (CLD) of prematurity. We aimed to determine whether the presence of microbial 16s ribosomal (16s rRNA) genes or Ureaplasma spp in lung lavage fluid from preterm neonates is linked to the development of CLD.

Sixty-seven infants <32 weeks' gestation, ventilated for neonatal respiratory distress syndrome (RDS), underwent serial bronchoalveolar lavage (BAL). BAL fluid was cultured for Ureaplasma spp and microbial 16s rRNA genes sought by PCR.

Fourteen infants (21%) had Ureaplasma spp in BAL. Two died, 11 developed CLD and three recovered from RDS ($p = 0.012$ CLD versus RDS). The mean gestational age of babies with Ureaplasma was 26 + 3 weeks ±2 days and of uncolonised babies was 27 + 5 weeks ±1 day, supporting the hypothesis that Ureaplasma is implicated in the pathogenesis of preterm labour. Culture was the best method of detecting Ureaplasma; however, PCR is effective in detecting 16s rRNA genes of other bacteria.

In the first 3 days of life 16s rRNA genes were present in 6/30 babies with RDS and 8/27 babies who developed CLD ($p = 0.4$); however, by 28 days or extubation, 10/30 babies with RDS and 19/27 babies with CLD had evidence of microbial colonisation ($p = 0.005$). *Staphylococcus epidermidis* was the commonest organism in infants with CLD or RDS. Other bacteria were found only in babies who developed CLD.

Ureaplasma spp is significantly associated with the development of CLD. Along with gestational age, microbial colonisation of the airways of preterm ventilated infants is significantly associated with the development of CLD.

Session 6C NNA: Developmental Care

6.10 NEONATAL NURSES' ATTITUDES TOWARDS EXTREMELY LOW GESTATION INFANTS

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Background: As more infants receive intensive care at extremely low gestations, the attitudes that neonatal nurses hold towards extreme prematurity will have a significant impact upon the nursing care that they provide to infants and families.
Aim: This study investigated the factors that may be impacting upon the attitudes of neonatal nurses towards extremely preterm birth.
Methods: Neonatal nurses from bands 5 to 8 working within the Trent Perinatal Network were recruited into a Q study. Nurses completed a Q Sort and follow-up interview. The Q Sort comprised 53 statements developed from literature surrounding extremely preterm birth. The semi-structured interview discussed participants' attitudes towards the Q statements. Q Sort and thematic analysis were used to analyze the data.
Results: 14 out of 48 nurses have currently undertaken the Q study. Emerging themes indicate nurses believe: disability has a profound impact upon infant and family quality of life and should be a factor in decision making; the impact of disability should be made explicit to parents; primary decision making surrounding treatment withdrawal should be undertaken by healthcare professionals; the care of borderline infants can sometimes conflict with their perception of their nursing role.
Conclusions: Current analysis of the interview data has identified common factors that nurses feel influence their care of extremely preterm infants. In order for nurses to provide optimum care, a more open and inclusive approach is needed when dealing with decisions about disability and care withdrawal.

6.11 "THE PROMISE OF CATCH-UP": MATERNAL EXPECTATIONS REGARDING THE NOTION OF "CATCH-UP" IN THE DEVELOPMENT OF PREMATURELY BORN INFANTS

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This presentation explores the phenomenon of catch-up, a term used in relation to the development of prematurely born children. It