significant difference in the percentage of women who did not deliver within 48 h (72% for placebo and 65%–88% for barusiban groups). Barusiban was well tolerated, although side effects were increased at higher concentrations. Postpartum blood loss and time to lactation were not significantly increased. There were no major safety concerns.

Conclusions: A single dose of selective oxytocin antagonist barusiban (0.3–10 mg) increased plasma concentrations to those calculated to be effective but did not delay delivery or reduce uterine contractions in women with threatened PTL and short cervical length. The results contrast with those of the mixed oxytocin/vasopressin antagonist, atosiban.

9.5 WITHDRAWN

Session 9B BAPM/NNS: Nutrition

9.6 DIFFERENTIAL EFFECTS OF MATERNAL NUTRIENT RESTRICTION ON INFLAMMATION IN RENAL AND ADIPOSE TISSUE IN OBESE JUVENILE OFFSPRING: THE ROLE OF TLR4 AND CCR2

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Introduction: Obesity is associated with a chronic inflammatory state. Key proinflammatory genes involved include Toll-like receptor 4 (TLR4) and chemokine receptor 2 (CCR2). We have previously shown, in sheep, that early-to-mid maternal nutrient restriction protects the kidney from the deleterious effects of juvenile obesity. The extent to which alterations, or differential tissue regulation, occur in these key genes after adolescent onset obesity is unknown. We examined the combined effects of maternal nutrient restriction during pregnancy and early-onset obesity on their distribution.

Methods: Eighteen pregnant sheep were randomly assigned to a normal (C, 7 MJ/day, n = 8) or nutrient restricted diet (NR, 3.5 MJ/day, n = 10) from days 30 to 80 gestation (term 147 days). After weaning, offspring had restricted activity and increased energy-dense food to promote obesity. Sheep were humanely killed at 1 year and tissues sampled. mRNA abundance of genes of interest in renal and perirenal adipose tissue were measured by real-time PCR. Animal ethics committee approval was given.

Results: Birthweight and weight at 1 year were not different between groups. Both TLR4 (C 1.0 ± 0.2, NR 2.0 ± 0.3, $p<0.05$) and CCR2 (C 1.0 ± 0.2, NR 3.9 ± 1.1, $p<0.05$) were upregulated in perirenal adipose tissue of nutrient restricted offspring but downregulated in the kidney (C 1.0 ± 0.2, NR 0.6 ± 0.1, $p<0.05$, C 1.0 ± 0.2, NR 0.4 ± 0.1, $p<0.05$, respectively).

Conclusions: Maternal nutrient restriction adversely affects adipose tissue through key proinflammatory genes but conversely protects the kidney from such effects. Identifying the mechanisms may offer potential tissue-specific therapies aimed at reducing the burden of the metabolic syndrome.

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9.7 THE EFFECT OF CAESAREAN SECTION AND A SINGLE ENTERAL FEED ON LIVER METABOLISM IN RESPONSE TO TOTAL PARENTERAL NUTRITION

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Total parenteral nutrition (TPN) in neonates frequently causes liver disorders. We have demonstrated that preterm piglets on TPN for 7 days develop fatty livers.[1] Despite some evidence of differing metabolism between preterm and term neonates, no study has previously compared liver function during TPN in preterm and term neonates, neither have they studied the effect of limited enteral feeding on liver metabolism during TPN.

Piglets were delivered by Caesarean section 4 days preterm (PT) or vaginally at term (T). They received either a single bolus of milk (F) or no enteral nutrition (UF) before commencing TPN. Jugular catheters were inserted 3 h postpartum and piglets were maintained on TPN plus intralipid 20% for 7 days, killed and tissue sampled.

Liver lipid content in preterm piglets was above 5% (w/w), the definition of steatosis,[2] but was significantly ($p<0.05$) reduced by pre-feeding (PT-UF 7.6 ± 0.8; PT-F 5.2 ± 0.3; T-UF 4.2 ± 0.2; T-F 3.5 ± 0.2% (w/w) ± SEM). Principal component analysis of NMR spectra of liver extracts showed that vaginal delivery at term and/or pre-feeding increased gluconeogenic precursors and ketone production. Phosphoenolpyruvatecarboxykinase activity was increased by feeding and birth (PT-UF 8.59 ± 0.59; PT-F 10.25 ± 2.28; T-UF 13.62 ± 0.96; T-F 12.00 ± 0.49 mU/mg protein).

This suggests that preterm Caesarean delivery results in a failure to switch between anabolic metabolism, seen in late gestation fetuses and glucagon-stimulated catabolic metabolism in term infants, resulting in increased hepatic lipid and glycogen storage (PT-UF 92.9 ± 22.4; PT-F 89.6 ± 30.2; T-UF 33.7 ± 8.7; T-F 47.5 ± 19.1 mg glucose/g tissue). The effects of Caesarean delivery preterm are partly mitigated by enteral feeding.

1. **Hyde MJ,** *et al*. *Neonatology* 2008;**93**:77–86.
2. **Cairns SR,** Peters T. *Clin Sci (London)* 1983;**65**:645–52.

9.8 DOES POSTNATAL GROWTH AFFECT POST-DISCHARGE MORBIDITY IN PRETERM INFANTS?

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Background: Preterm infants are more likely than term infants to develop ongoing morbidity after initial hospital discharge. It is unclear whether this is associated with specific patterns of postnatal growth.

Aim: To study the association between postnatal growth patterns and post-discharge morbidity in preterm infants born at <33 weeks' gestation.

Methods: Infants recruited from a tertiary neonatal intensive care unit over a 12-month period were prospectively followed until 18 months corrected age. Infants were stratified depending on their change in weight Z-score at 28 days and 18 months resulting in four groups with differing postnatal growth patterns (see table): group 1 (persisting poor growth), group 2 (poor post-neonatal growth), group 3 (post-neonatal catch-up growth) and group 4 (adequate growth). Prospective data on rehospitalisation, general practitioner and A&E visits were compared using non-parametric tests.

Results: 119 infants were recruited and morbidity was analyzed for 108 (92%). There were no significant differences in morbidity. Logistic regression analyzed the association between rehospitalisation and change in weight Z-score (odds ratio (OR) 1.3, 95% CI 0.9 to 1.8; $p = 0.1$), birthweight <1000 g (OR 2.9, CI 1.1 to 7.5; $p = 0.03$) and cerebral palsy (OR 8.1, 95% CI 1.7 to 38.2; $p = 0.008$).

Conclusions: Postnatal growth pattern was not associated with measures of post-discharge morbidity in this cohort, suggesting that

Abstract 9.8

	Group 1 (n = 16)	Group 2 (n = 18)	Group 3 (n = 24)	Group 4 (n = 50)	p Value*
Z-score change B–28 days	⩾−1	<−1	⩾−1	<−1	
Z-score change B–18 months	⩾−1	⩾−1	<−1	<−1	
Rehospitalisation	1 (0–7)	0 (0–11)	1 (0–10)	0 (0–11)	0.11
GP visits	5 (1–18)	8 (1–18)	8 (1–40)	4 (0–26)	0.25
A&E visits	1 (0–3)	0 (0–4)	0 (0–5)	0 (0–8)	0.91

B, birth. Values are median (range) number of episodes. *Wilcoxon rank sum test.

improving post-discharge growth may not result in measurable health benefits.

9.9 THE EPICURE STUDY: LONGITUDINAL GROWTH MEASUREMENTS OVER AN 11-YEAR FOLLOW-UP PERIOD

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Background: Prematurity is associated with poor somatic growth in infancy but results of longer follow-up are inconsistent.
Aims: To compare serial height, weight, body mass index and occipito-frontal circumference (OFC) of all children born ⩽25 + 6 weeks' gestation from 1 March 1995 to 31 December 1995 in the United Kingdom and Ireland with term born classmates.
Methods: Of 1289 livebirths, 283 of 308 survivors were seen at 30 months and 219 (72% of survivors) at 11 years with 153 age and sex-matched controls taken from randomly selected classmates. Measurements were taken by three paediatricians using a Leicester stadometer, standardised weighting scales and a Secca head circumference tape measure. Measurements were converted to Z-scores using Child Growth Foundation norms for chronological age.
Results: Height, weight, OFC and BMI were significantly lower among preterm children than in their term born classmates, who differed only slightly from population norms; growth in OFC showed the greatest impairment at 11 years. Only growth in weight (and therefore BMI) showed catch-up between the two assessments in 200 children followed longitudinally (see table).
Conclusions: Infants born ⩽25 + 6 weeks remain shorter, lighter and with smaller head circumferences compared with controls and population norms at 11 years. Only weight has shown catch-up over the intervening 8 years but the extremely preterm children remain with lower BMI compared with controls.

Abstract 9.9

	EP children Z-score (SD)	Controls Z-score (SD)	Difference of means (95% CI)	Change in Z-score 30 months to 11 years
Height	−0.55 (1.02)	0.15 (1.01)	0.71 (0.50 to 0.92)**	+0.20 (−0.02 to 0.42)
Weight	−0.42 (1.28)	0.21 (1.17)	0.62 (0.37 to 0.88)**	+0.79 (0.53 to 1.05)**
BMI	−0.22 (1.38)	0.17 (1.26)	0.39 (0.11 to 0.66)*	+0.80 (0.52 to 1.08)**
OFC	−1.27 (1.25)	0.15 (0.99)	1.26 (1.02 to 1.50)**	+0.25 (−0.02 to 0.51)

BMI, body mass index; EP, extremely preterm; OFC, occipito-frontal circumference.
*p<0.01; **p<0.001.

Session 9C NNA: Surgical Interventions

9.10 FIRST IMPRESSIONS: THE EXPERIENCES AND PERCEPTIONS OF FATHERS OF THEIR FIRST VISIT TO THE NEONATAL UNIT

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Most fathers in the United Kingdom are present at the birth and immediate care of their baby. When a newborn baby requires admission to the neonatal unit it is generally common practice for the father either to accompany his baby or to visit shortly afterwards. However, there is limited evidence regarding fathers' experiences and feelings about their first visit to their baby in the neonatal unit. Recent directives in the United Kingdom have identified the need to empower and engage fathers. It is therefore important to understand the father's perspective of an occasion such as this.

The aim of this study was to gain an understanding of the experiences and perceptions of fathers when they first visited their baby in the neonatal unit. Semi-structured interviews were undertaken with 20 first-time fathers recruited from one neonatal unit in the United Kingdom. Fathers were asked to describe what happened and their feelings around this time. Their responses were analyzed using qualitative methods. Themes that emerged from the interviews were: the dilemma about the timing of the first visit; the impact of the sights and sounds of the neonatal unit; their recall of information given; the nature and extent of their interaction with the baby and the overall effect that this first visit had upon them.

Knowledge generated by this study will inform healthcare professional education and training and the development of policy and health education. Consequently, the quality of care provision will be enhanced and the needs of fathers more fully addressed.

9.11 NURSING WORKLOAD IN UK TERTIARY NEONATAL UNITS

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Background: Neonatal intensive care requires adequate numbers of trained neonatal nurses to provide safe, effective care; but existing research into the relation between nurse numbers and the care needs of babies is over 10 years old. Since then, the preterm population and treatment practices have changed considerably.
Aims: To validate the dependency categories of the British Association of Perinatal Medicine (BAPM, 2001) and to revalidate the northern region categories (NR, 1993) in relation to contemporary nursing workload.
Setting: Three tertiary neonatal intensive care services in England.
Methods: Direct observations by trained observers captured nursing activity around each baby every 10 minutes. Time spent on each nursing activity was related to the dependency category of the baby and the grade of the nurse.
Results: Both scales detected differences between categories. Discrimination between individual categories was improved when nasal continuous positive airway pressure (nCPAP) was distinguished from ventilation. All categories attracted more time compared with 1993. Babies in BAPM1/NRA occupied nursing time for a median of 56 minutes per hour (interquartile range 48–70); those on nCPAP or BAPM2/NRB for a median of 36 minutes per hour, (27–42); those in BAPM3/NRC