Conclusions Neurodevelopment at preschool age is better for VPT children with normal SP and Gaze at 4 months. The effect of subnormal Gaze seems more pervasive, indicating head movements to compensate effectively for poor SP.

PO-0458 FULL-TERM NEWBORNS DETECT MATERNAL BREAST ODOURS AT A CORtical LEVEL: A MULTICHANNEL NIRS STUDY

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Background and aims Behavioural and physiological changes have been recorded in newborns following exposure to maternal odours. We aimed to investigate the cortical activation following the presentation of maternal breast odours (MBO).

Methods We used a multichannel NIRS device to record bilaterally cortical activation in the orbito-frontal gyri (OFG), prefrontal (PFC) and primary somatosensory (S1) cortices during 50 s (10 s baseline, 10 s presentation, 30 s post-stimuli). Odours were presented in controlled conditions (silent room, active sleep, randomised order) using cotton cloths: clean (CC) and worn by the mother in her bra during preceding 12 h (MBO). Seventeen full-term infants were included. After systematic artefact removal HbO2 changes from baseline and between odours were compared using ANOVA and post-hoc analysis.

Results We found no S1 activation following any odour. MBO (and not CC) induced an increase bilaterally in the OFG (p > 0.001).

MBO as compared to CC elicited a higher increase (p < 0.05) in the OFG bilaterally and in the left PFC.

The mean increase of HbO2 from baseline during the 30 s post stimuli were higher in MBO as compared to CC:
- 3.3 (0.7–5.9) µmol/l vs 0.8 (-1.4–3.0) µmol/l in the left OFG.
- 2.4 (-0.3–5.2) µmol/l vs 1.1 (-1.2–3.4) µmol/l in the right OFG.

Conclusions Newborn infants can detect their MBO at a cortical level and discriminate it from a control smell. As MBO is used in the NICU it is of great interest to further investigate how hospitalised infants react cortically to MBO.

PO-0459 FAT MASS (FM) AND FAT FREE MASS (FFM) INDICES IN PRETERM AND TERM INFANTS DURING FIRST 6 MONTHS OF LIFE

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Background The development of normative reference Body Composition (BC) data in infancy, is an important step towards evaluation of postnatal growth in clinical practice. Weight gain fails to differentiate lean body mass (composition) from fat mass (nutrition). Percentile ranks and length normalised indices of

Abstract PO-0459 Figure 1
FFM and FM can define nutritional depletion or obesity. We present longitudinal data from a large dataset of stable growing infants.

**Methods**

BC data (n = 857) from 574 infants (22–42 weeks) enrolled in 4 longitudinal studies, 2/3rd were preterm, considered as independent data points. Preterms on fortified breast milk or formula (80 kcal/dL), term infants on breast milk or formula (67 kcal/dL). Time points of measurement: after reaching full enteral feeding, at term and two further time points until a maximum of 6 months of corrected age. BC was measured by Dual energy X-ray absorptiometry (QDR 1500; Hologic). R software (GAMLSS) used for construction of growth curves.

**Results**

Length of preterms remain shorter than terms, both increases linearly at 0.7 cm/wk. Median FM/FFM in preterm is 500 g/2450 g (40 weeks) and 1700 g/4500 g (60 weeks) compared to 430 g/2790 g (40 weeks) and 2400 g/4700 g (60 weeks) for term. Preterm FMI centiles are higher than terms till 45–50 weeks corrected. Preterm FFMI increases progressively till 40 weeks, then remains constant over time like terms (Figure 1).

**Conclusion**

Growth pattern for preterm vary from term, justifying their higher nutritional requirement to support rapid FFM growth initially. FM being inverse of FFM, length normalised indices rather than percentages allow independent assessment of growth in each body compartment, while compensating for difference in body size of term and preterm infants.

**PO-0460**

IDENTIFYING TRAJECTORIES FOR HEALTHY POSTNATAL GROWTH OF PRETERM INFANTS

Raja, Rochow, Goertler, Jahn, Seigel, Campbell, Heckmann, Poeschl, Fuchs.

**Background**

Growth of preterm infants should follow intrauterine rates. Postnatal loss of extracellular fluid shifts growth trajectories to a percentile below that in utero. Which ‘new’ trajectory a preterm infant should adjust to after completed postnatal adaptation is unknown.

**Objective**

1) To develop a model for postnatal growth trajectories of preterm infants by characterising growth of such infants which required only minimal postnatal support; 2) to predict trajectories for healthy postnatal growth in any given infant.

**Methods**

Inclusion criteria: infants with (A) 30–35 and (B) 24–29 weeks GA, admitted 2008–2012 to participating hospitals. Exclusion criteria: (A)+(B) maternal diabetes/substance use, nosocomial sepsis (positive blood culture until day of life (DoL) >3 days, not on full enteral feeds by DoL >10, (B) mechanical ventilation on DoL >3, FiO2 ≥ 0.3 within first 21 DoL, NEC >stage 2, IVH >2, PVL. Models to predict body weight trajectories on DoL 14 and 21 were developed.

**Results**

890 infants were eligible of 6915 meeting inclusion criteria. Infants had maximum weight loss by DoL 5, regained birth weight by DoL 11 and showed stable growth parallel to intrauterine percentiles during DoL 7–21. Surprisingly the new trajectory was independent from GA with a z-score difference from birth of (A) -0.96 ± 0.75 and (B) -0.88 ± 0.67 at DoL14. Linear regression models predicted weight at DoL 14 (R2=0.88) and 21 (R2=0.82).

**Conclusions**

1) The study provides robust estimates of ideal postnatal growth trajectories for preterm infants. 2) The impact on long-term outcome using these trajectories for nutritional adjustment needs to be assessed, ideally in an RCT.

**PO-0461**

HEART RATE VARIABILITY IN FULL-TERM NEONATES WITH HYPOXIC ISCHAEMIC ENCEPHALOPATHY

Goulding, Stevenson, Murray, Livingstone, Boylan.

**Background**

Infants had maximum weight loss by DoL 5, regained birth weight by DoL 11 and showed stable growth parallel to intrauterine percentiles during DoL 7–21. Surprisingly the new trajectory was independent from GA with a z-score difference from birth of (A) -0.96 ± 0.75 and (B) -0.88 ± 0.67 at DoL14. Linear regression models predicted weight at DoL 14 (R2=0.88) and 21 (R2=0.82).

**PO-0466**

IDENTIFYING TRAJECTORIES FOR HEALTHY POSTNATAL GROWTH OF PRETERM INFANTS

Raja, Rochow, Goertler, Jahn, Seigel, Campbell, Heckmann, Poeschl, Fuchs.

**Background**

Growth of preterm infants should follow intrauterine rates. Postnatal loss of extracellular fluid shifts growth trajectories to a percentile below that in utero. Which ‘new’ trajectory a preterm infant should adjust to after completed postnatal adaptation is unknown.

**Objective**

1) To develop a model for postnatal growth trajectories of preterm infants by characterising growth of such infants which required only minimal postnatal support; 2) to predict trajectories for healthy postnatal growth in any given infant.

**Methods**

Inclusion criteria: infants with (A) 30–35 and (B) 24–29 weeks GA, admitted 2008–2012 to participating hospitals. Exclusion criteria: (A)+(B) maternal diabetes/substance use, nosocomial sepsis (positive blood culture until day of life (DoL) >3 days, not on full enteral feeds by DoL >10, (B) mechanical ventilation on DoL >3, FiO2 ≥ 0.3 within first 21 DoL, NEC >stage 2, IVH >2, PVL. Models to predict body weight trajectories on DoL 14 and 21 were developed.

**Results**

890 infants were eligible of 6915 meeting inclusion criteria. Infants had maximum weight loss by DoL 5, regained birth weight by DoL 11 and showed stable growth parallel to intrauterine percentiles during DoL 7–21. Surprisingly the new trajectory was independent from GA with a z-score difference from birth of (A) -0.96 ± 0.75 and (B) -0.88 ± 0.67 at DoL14. Linear regression models predicted weight at DoL 14 (R2=0.88) and 21 (R2=0.82).

**Conclusions**

1) The study provides robust estimates of ideal postnatal growth trajectories for preterm infants. 2) The impact on long-term outcome using these trajectories for nutritional adjustment needs to be assessed, ideally in an RCT.